Satellites and Senses of Place: Remote Monitoring of Guatemala's Maya Biosphere Reserve

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SATELLITES AND SENSES OF PLACE: REMOTE MONITORING OF GUATEMALA’S MAYA BIOSPHERE RESERVE

A dissertation submitted in partial satisfaction of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

ANTHROPOLOGY

by

Micha Rahder

June 2014

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2014
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List of Abbreviations

ACOFOP – Asociación de Comunidades Forestales de Petén [Association of Forest Communities of the Petén]

AFISAP – Asociación Forestal Integral de San Andrés, Petén [Integrated Forestry Association of San Andrés, Petén]

CALAS – Centro de Acción Legal Ambiental y Social [Center for Legal Action in Environment and Social Issues]

COCODE – Consejo Comunitario de Desarrollo [Community Development Council]

CONAP – Consejo Nacional de Areas Protegidas [National Protected Area Council]

CONRED – Coordinadora Nacional para la Reducción de Desastres [National Coordinator for Disaster Reduction]

CEMEC – Centro de Monitoreo y Evaluación de CONAP [Center for Monitoring and Evaluation of CONAP]

CI – Conservation International

DFID – United Kingdom Department for International Development

DIPRONA - División de Protección de la Naturaleza [Nature Protection Division (of the Guatemalan National Civil Police)]

DOI – U.S. Department of the Interior

FARES – Foundation for Anthropological Research and Environmental Studies

FYDEP – Fomento y Desarrollo de Petén [Promotion and Development of Petén]

GIS – Geographic Information Systems/Science)

GPS – Global Positioning Systems

IDAEH – Instituto de Antropología y Historia de Guatemala [Guatemalan Institute of Anthropology and History]

INAB - Instituto Nacional de Bosques [National Forest Institute of Guatemala]

INSIVUMEH - Instituto Nacional de Sismologia, Vulcanología, Meteorología e Hidrología [National Institute of Seismology, Vulcanology, Meteorology, and Hydrology]

MINUGUA – United Nations Verification Mission in Guatemala
MODIS – Moderate-Resolution Imaging Spectroradiometer
NASA – National Aeronautics and Space Administration
NOAA – National Oceanic and Atmospheric Administration
NTFP – Non-timber forest product
OMYC – Organización de Manejo y Conservación de Uaxactún [Conservation and Management Organization of Uaxactún]
PACUNAM – Fundación Patrimonio Cultural y Natural Maya [Foundation for Maya Natural and Cultural Patrimony]
SIPECIF – Sistema Nacional de Prevención y Control de Incendios Forestales [National System for Prevention and Control of Forest Fires]
SNEM – Servicio Nacional de Erradicación de Malaria [National Service for the Eradication of Malaria]
TNC – The Nature Conservancy
UNESCO – United Nations Educational, Scientific, and Cultural Organization
USAID – United States Agency for International Development
WCS – Wildlife Conservation Society
ABSTRACT

Satellites and Senses of Place: Remote Monitoring of Guatemala's Maya Biosphere Reserve

Micha Rahder

Remote sensing technologies, such as satellite imagery, along with geographic information systems (GIS) computer programs, which can analyze complex spatial data, are emerging as key instruments in the global conservation toolbox. These rapidly developing technologies allow for new visions of forested landscapes and new forms of social and ecological analysis, and my research investigates both the production of scientific knowledge enabled by remote sensing and GIS, and how this knowledge is used and transformed in application by conservationists. Drawing on over 14 months of field research in Guatemala's Maya Biosphere Reserve — widely recognized as one of the most difficult places in the world to do forest conservation — I analyze how Guatemala’s continued history of violence and inequality intersect with technoscience, environmental knowledge, and governance. I present ethnographic accounts of the work of remote monitoring, information processing, and map-making in a joint state-NGO computer lab; the use, interpretation, and transformation of maps and reports by conservationists; and the intersections of this official knowledge with daily lives and livelihoods inside the reserve. I analyze diffractively across these sites and sources, bringing together mundane data processing, images and reports, conservation decisions, local subsistence practices, and both ordinary and exceptional violence.
This research reveals the unexpected movements of meaning and politics across scales, the co-construction of official, centralized knowledge with multiple senses of place, space, time, and identity, and the ways in which science and technology are embroiled with deeply felt desires for clarity in a reserve characterized by uncertainty and rapid change. I argue that the violence and political paranoia that characterize post-civil war Guatemala are deeply entangled with the production and interpretation of scientific knowledge about its landscapes and people. Finally, I analyze how this knowledge can facilitate collaboration across social and political difference, while also reinforcing those differences and their embedded power dynamics. This research draws together and contributes to science and technology studies (STS) and environmental anthropology, and also contributes to broad interdisciplinary and applied discussions on the politics of conservation and development practice by examining the dynamics of authority, technology, and knowledge in environmental governance on a troubled landscape.
Acknowledgements

It is hard to acknowledge all those who have contributed to the making of this dissertation, as it feels less like a product of graduate school and more like one stop (albeit a very momentous one) on a lifelong journey of thinking deeply about science, forests, and people on tropical landscapes. First, then, I thank the forests of Central America for inspiring me with enduring curiosity, for hanging on despite such powerful destructive forces working towards their end, and for providing endless nourishment to my mind, senses, and politics. These are not things that the forests can do alone, however, so I must also thank some people who have helped along the way.

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For my father and Opa, the two Harro Rahders,

who knew the value of curiosity and weren't afraid to get their hands dirty
CHAPTER ONE

The Eye of the Storm

The Maya Biosphere Reserve in the Petén, Guatemala, is widely recognized as one of the most difficult places in the world to do conservation. As the Guatemalan National Protected Area Council (Consejo Nacional de Areas Protegidas/CONAP) and a multitude of non-governmental organizations (NGOs) attempt to stem the tide of deforestation that continues inside the reserve, they draw increasingly on knowledge of the landscape produced by remote monitoring, particularly satellite imagery and aerial photography, and on GIS analyses and maps produced by technicians in the hybrid state-NGO institution, the Center for Monitoring and Evaluation of CONAP (Centro de Monitoreo y Evaluación de CONAP/CEMEC). These rapidly developing technologies allow for new visions of the reserve's forested landscapes and new forms of social and ecological analysis, and this dissertation follows both the production of technoscientific knowledge occurring within CEMEC, and how this knowledge is used and transformed in application by conservationists.
By situating this research in the conflict-ridden Maya Biosphere Reserve, I analyze how Guatemala’s ongoing histories of violence, instability, and extreme inequality intersect with technoscience and environmental knowledge and action.

The largest protected area in Central America, the Maya Biosphere Reserve is over twice the size of Yellowstone National Park in the western United States. The reserve stretches over 21,600 square kilometers (8,300 square miles) of thick, tangled tropical lowland forests, boggy wetlands, and — increasingly — cleared agricultural or ranching landscapes. Home to the spectacular jungle-hidden ruins of the ancient Mayan city of Tikal, the reserve is also a major tourist destination for both Guatemalan and international visitors. A 2001 census of the reserve measured the population living inside its boundaries at over 80,000 (Ramos et al. 2001), and a 2011 estimate raised this number to 118,000 (WCS 2011). This includes both legal settlements — with community forest concessions or agreements for sustainable land use, particularly in villages with longstanding (pre-1970s) history in the Petén forests — and illegal settlements holding out in tense relations with conservationists and park patrols, neither legally allowed to remain nor (thus far) forcibly evicted. These communities are primarily Ladino (the Spanish-speaking ethnic majority in Guatemala), but about 20% of the population are Q’eqchi’ Maya who migrated to the Petén from other parts of the country, followed by a small minority of Itza’ Maya, indigenous to the region (Ramos et al. 2001). By 2001, the population inside the reserve was already nearly triple the size of the population of the entire Petén
department only four decades ago: the Petén was long considered a remote, inaccessible, and backwards region of Guatemala.

The place of the Petén in the national imagination has shifted wildly over the past forty years, from a backwards and uninhabitable jungle, to a colonization frontier that held the promise of a bit of earth for hundreds of thousands of poor Guatemalans, to a horrifically violent site of civil war atrocities, and then to the site of a global environmental crisis that necessitated the intervention of multiple international agencies (Schwartz 1990; Meyerson 1998; Primack et al. 1998; Nations 2006). The tremendous population growth in the Petén over the past forty years was caused by a confluence of factors that continue to shape relations and encounters on the landscape today. By far the largest department, the Petén represents about a third of Guatemala’s land, yet was home to fewer than 30,000 people until 1970 (Schwartz 1990). In the late 1960s, in order to relieve political pressure caused by the country’s vast inequality in land ownership and access (but without actually addressing the roots of that inequality), the military-dominated government began a series of colonization programs, encouraging poor, landless peasants to clear the land and settle the region while simultaneously excluding them from the benefits of state programs that boosted the holdings of the cattle ranchers and oil companies who followed closely on their heels (Berger 1992). During the 1970s and early 1980s, the vast jungles of the department also provided cover for insurgent forces, as well as a relatively safe path of flight for hundreds of thousands of internally-displaced indigenous Maya whose highland villages were violently razed in scorched earth
campaigns. These multiple migrations waxed and waned over the years, but the push of military violence and extreme poverty and the pull of available land combined to produce an immense population boom in the lowlands, with the current population estimated at around 750,000 and still growing.

As a result of this spectacular growth, more than half of the Petén’s forests were lost by the mid-1980s, drawing international attention and leading to the Maya Biosphere Reserve’s establishment in 1990. Based on a UNESCO model, biosphere reserves are intended to balance biodiversity conservation with sustainable local livelihoods. The reserve is thus a patchwork of nuclear zones — national parks and other areas exclusive to human settlement or use (other than research or tourism); multiple-use zones — areas available for human settlement and livelihoods based on sustainable extraction of timber and other forest products; and a buffer zone — a
10km-wide strip of densely-inhabited land along the southern border of the reserve, intended to stem the tide of further migration into the forest (figure 1.1). But chronic mistrust, inequality, political instability, corruption, and endemic violence have thrown up barriers to the reserve’s lofty goals of balanced conservation and development (Meyerson 1998).

While some regions of the reserve have seen success in maintaining forest cover, many areas are now overrun by agricultural expansion fueled by rapid population growth and deep poverty, as well as the cattle ranching, oil, and drug trafficking interests that continue to follow closely on the heels of peasant migrants. And while nearly two decades have passed since the 1996 peace accords, memories of Guatemala’s 36-year long civil war and continued impunity for state-orchestrated genocide continue to haunt the landscape, even as the brutal drug war has now moved in. Overlaid on this landscape are a boggling number of state agencies and NGOs working in the reserve, with overlapping and contradictory projects, jurisdictions, and constantly shifting alliances between them. Fearful of hidden agendas, Guatemalan and foreign conservationists working in these organizations talk constantly about what they perceive as conservation’s failures, and this mistrust and disorganization has bred confusion on the ground: managerial boundaries are drawn and redrawn, with new projects, governing bodies, and physical zoning limits layered on top of old ones rather than replacing them outright.
CEMEC: The Eye of the Storm

As a result of all of these complex histories and dynamics, the Maya Biosphere Reserve is an encounter of many worlds, competing and crashing together on the same landscape. And CEMEC, the Protected Area Council’s Center for Monitoring and Evaluation, sits as the eye of that storm. Or the eyes, quite literally: CEMEC gathers information from satellites, sensors, cameras, and human bodies sent to observe and report. Massive amounts of monitoring data come into CEMEC from an ever-growing number of sources, where it is tamed into maps, reports, and databases, and made freely available to (most of) those who request it. Since its beginnings as a modest three-person operation in 1997, CEMEC has grown into one of the most widely-known, used, and trusted sources of authoritative knowledge about the social and environmental dynamics of the entire Maya Biosphere Reserve.

CEMEC, as “eye,” does not take on a passive role, simply acquiring and distributing data at the request of other actors or institutions. Many of the activities now considered routine and fundamental to the institution — for example, annual monitoring flights that capture low altitude photography of cattle, human settlements, and fire damage — were dreamed up as possibilities by CEMEC’s director, Victor Hugo Ramos,\(^1\) and have since become indispensable throughout the reserve. This

\(^1\) While most names and identities have been anonymized throughout this dissertation, several figures - including Ramos here - do appear under their real names due to their positions as institutional leaders or public figures. In general, when people were speaking as representatives of particular institutions, or when drawing on quotations from public fora, I use real names and affiliations, although at other times these same individuals may appear under pseudonyms when drawing on material from in-depth interviews or other more confidential contexts.
work is deeply supported by the US-based NGO the Wildlife Conservation Society (WCS), which also includes biological and ecological monitoring of the reserve in its local mandate. As a sub-department of the Petén branch of CONAP, CEMEC is officially a part of a state institution, and is currently located within CONAP’s regional offices in a building in San Benito, Petén. But approximately two thirds of its funding flows from WCS, who legally co-administers the monitoring lab via signed agreement with CONAP.

This state-NGO hybridity offers CEMEC both advantages and disadvantages. As Ramos pointed out, one of the key advantages of being part of the state is that their data is recognized as more or less “official,” which makes it much easier to work with others inside the government and provides a certain level of authority for working with those outside of it. The disadvantages are related to the well-known instability, corruption, and inefficacy of Guatemalan state institutions, including problems such as nepotism, political deprioritizing of environmental issues, lack of continuity in institutional personnel or priorities, and consistently scarce resources. As such, Ramos declared that CEMEC’s current co-management by an NGO was the “best possible” position given these various constraints. While the relations between CONAP and WCS surrounding management of CEMEC have not always been tension-free, the agreement has endured and been repeatedly renewed over the years, giving long-term stability and support to the lab.

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2 San Benito, Santa Elena, and Flores (the departmental capital) together form the geographically contiguous “central urban area” of the Petén, just outside the borders of the Maya Biosphere Reserve. All government and NGO institutions working in the reserve have their offices in this urban area.
CHAPTER ONE: The Eye of the Storm

Ramos and WCS-Guatemala director Roan Balas McNab, an American expat who has lived and worked in the Petén since the late 1990s, have worked closely together for many years, and together have extraordinary institutional knowledge — not just of their own institutions, but of the broader landscape of individual actors, state agencies, NGOs, private interests, local community factions, and both domestic and foreign funders that might be called upon to support new monitoring projects. For example, the annual aerial photography flights mentioned above are the result of a partnership with a U.S.-based charitable organization, Lighthawk, which draws on retired American Pilots with their own lightweight aircraft to volunteer for conservation monitoring projects around the world. As Ramos told me:

Nobody asked us to do that. And we’re doing it. Right now we’re using it for specific ends, like demographic monitoring, like monitoring cattle. We’re also using the photographs for certain proposals, or to validate our remote sensing products. All this, nobody told us we had to do it. We just started to do it because it seemed like a good idea. And now, they wait for us to do it!

As another example, when I left Guatemala in early 2012, CEMEC was working towards the acquisition and use of small drones that could accomplish this annual photographic monitoring even more cheaply and easily. Ramos and many of the technicians working in the lab also brought up ongoing efforts to secure funding for an office server as the most important project for the office — such a server would enable the central storage and coordination of the institution’s many databases, rather than their current awkward distribution, with many overlapping versions, across
CHAPTER ONE: The Eye of the Storm

multiple machines. All of these projects are thought up by Ramos, sometimes in conjunction with McNab or others, and are brought to fruition through their personal commitment, drive, and savvy in negotiating both institutional and technical worlds.

As a result of all this activity, CEMEC has emerged as a powerful clearinghouse of information about the reserve, with a wide variety of people and organizations relying on their maps and reports. CEMEC estimates that they receive an average of 2000 individual requests for information per year, on top of their regular annual reporting activities and support for specific ongoing projects. These regular annual activities now include reports on:

• deforestation (using NASA LANDSAT imagery)
• near-real time fire reporting during the months of February-May (using NASA MODIS data)
• maps of annual fire damage (NASA LANDSAT images and aerial photography)
• monitoring of human populations (aerial photography)
• monitoring of cattle presence (aerial photography)

As a supplement to their regular land use change monitoring via satellite imagery, the lab has begun georeferencing (precisely locating digitized photos via geographic coordinates) huge numbers of aerial photographs as a way to “ground truth” (verify) their deforestation estimates.³ In 2011, the office also began

³ Traditionally, “ground truthing” refers to sending people out on the ground to verify aerial or satellite imagery. Due to budgetary and logistic constraints, however, most of the ground truthing performed by CEMEC is actually triangulation and verification
georeferencing an enormous database of historical aerial photographs of the region from the 1980s, to provide a pre-reserve baseline of forest cover. CEMEC also manages information from a network of climate monitoring stations, some under their purview and others belonging to other institutions — INSIVUMEH (National Institute for Seismology, Vulcanology, Meteorology and Hydrology), the NGO ProPetén, and others — and distribute daily and weekly climate updates, particularly during the fire season.

Finally, CEMEC regularly supports a wide variety of projects for both the state and NGOs. They provide maps and data for protected area master plans, five-year management plans, and other documents. They conducted an enormously difficult and successful census of the reserve in 2000-2001, and continue to monitor population growth on an annual basis. They build sophisticated GIS models of future deforestation and land use change. They began collecting and systemizing data on all non-timber forest products harvested by community concessions in 2011, with the goal of creating a new comprehensive database of these activities across the reserve. They collect livelihood data, track financial contributions to the reserve, model future climate change impacts, settle boundary disputes, monitor water quality in local lakes, track reported crimes, build websites, prepare and present formal PowerPoint slideshows on the reserve, provide trainings in GPS and technical skills to a wide variety of actors, and more. And throughout all of these activities, the office, led by

of data sources with other imagery of higher resolution - either aerial photography to verify satellite data, or sometimes purchased high-resolution satellite imagery to verify freely-available lower-resolution LANDSAT images.
Ramos, is keenly aware of the power of communication, simple graphics, and clear messaging. Ramos told me:

If we’re presenting, for example, to *diputados* [members of congress], we make it as simple as possible. Not because the diputados are people who don’t know how to think, or don’t understand things, but sometimes they don’t have a lot of time, they’re always on the run, and this is one of the arguments that is brought up for making information accessible to people. And with the public as well, we try to make things like that, the most understandable possible. Some things can’t be brought down from high levels of complexity; you can’t reduce their complexity because they’re complex things, unto themselves, right? So you just can’t. But we try.

One of the most common activities in the office is simultaneously one of the simplest to complete and yet one of the most powerful: CEMEC estimates that at least 250 requests for “location” mapping occur per year. These *constancias de ubicación* (evidence, record, or proof of location) involve the creation of small maps indicating the geographic coordinate position and legal jurisdiction of particular locations. This may be either a request to “locate” an existing structure or place (requiring a GPS technician to go to the field to take coordinates, return to the office to map them, and then report on which jurisdictional area of the reserve they lie in), or to verify the location for plans to build new structures or infrastructures. Schools, farms, cell phone towers, fences – any new construction legally requires precise location, since Protected Area laws restrict and regulate all building activities in the reserve. This is
CHAPTER ONE: The Eye of the Storm

an extremely simple, even dull, task for technicians, but one that determines land
access and building rights on a hotly contested landscape.

CEMEC keeps registries of all public requests for information and maps, with
a separate book specifically dedicated to the “location” maps. These records are
incomplete (internal requests from other CONAP departments and WCS are often
excluded, and requests for information now increasingly come over email or skype,
skipping the secretary’s desk and register altogether) but nonetheless give an
overview and historical trajectory to the types of institutions and actors using
CEMEC’s information, as well as which areas of the reserve received the most
attention in which years. For example, requests for maps of Mirador-Rio Azul
National Park clearly ebb and flow with the cycles of controversy over the future of
that park (detailed in Chapter six), and the number of requests arriving from other
departments of CONAP jumped by over 70% when CEMEC's office relocated from
Flores into the regional CONAP office. In many ways, CEMEC’s registers tell a
history of the institutions, areas of interest, and priorities of the reserve. But even
before being entered in the official register, requests for information may take
different paths through the institution, depending on who is asking. Students,
researchers, or representatives of known NGOs can simply enter the office and
request data, while landowners, ranchers, or unknown Guatemalans (foreigners seem
to be given a protective sheen of positive assumptions) must make a formal request
through the technical administration of CONAP, getting clearance from other levels
of Protected Area bureaucracy before being granted access to information.
Overall, CEMEC’s influence and centrality has grown enormously since their beginnings in 1997, which Ramos attributes to a combination of technological change and inter-institutional political pressure:

I believe it has changed because maybe now people are more receptive to technological things, and now it’s easier, for example, to make a presentation in PowerPoint, use a projector to show interesting things. It probably has something to do with that. But there’s also an insistence from certain institutions, or certain specific people, in arguing their positions with the data. You have to give credit, for example, to Roan [Balas McNab], who has pushed a lot on using the data, using them to advocate [hacer incidencia], to make changes, right? And, fortunately, there’s been receptivity on the part of people from CONAP, and on the part of other sectors of the government, to start to use data to make decisions, with respect to things that emerge from the field [el campo]. It wasn’t like this before; it wasn’t so easy. For example, now we have a good internet connection, we can send an email to a thousand people without so many problems. Before, not everybody had email addresses, it wasn’t so easy to send the information, you know? So it’s a mix between the two things, ease of access to information and technology, and also specific work in insisting on using information to make decisions. And to show things that at times aren’t particularly agreeable for the government, right? But we have to show them – it’s the reality, how it is – and to try to provoke changes with that.
In general, CEMEC's technical staff are extremely proud of their work, both in terms of personal accomplishment in technical skills rare in Guatemala, and in their knowledge that the data and reports they produce are widely used and trusted across sectors, actors, and institutions. Despite the often mind-numbingly dull day to day work in the lab — the tasks associated with processing satellite or aerial imagery are usually highly repetitive — the technicians consistently reported that awareness of the ultimate products of their labor, and of the perceived usefulness of those products, were deeply satisfying. As a single example, one technician, Julio, told me about the difference between preparing data for an ambitious UK Department for International Development (DFID)-funded “State of the Maya Biosphere Reserve” report — working on one theme at a time, highly focused on particular areas — and then seeing the first draft of the report come together. Julio emerged with a new impression of the scope of his own work, particularly the way he could read across all the different indicators of the report to tell a new story:

The scope that you can have with all that information - whew! Because when I was working on it, I just focused: I’m working on this theme, checking that this detail comes out right, that this comes out right, and then I’d finish with that theme. But then when you look at it all together, you can see how this thing is happening in the same place as that thing, and you start to see something interesting. This plus this. Let’s say, for example, control posts with deforestation. So there is deforestation where there are no control posts. Or if there is deforestation where there’s a post, what’s happening with that
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post? Things like that, no? Just as an example. There are a ton of possibilities with this much information.

It is this broader story told by many CEMEC’s many maps and reports, along with its emergence, travels, and impact, which forms the foundation for my own story of technoscience, violence, and environmental knowledge and action.

Skyping in Silence

CEMEC is the "eye of the storm" in a second sense as well — it is the calm, the uncontested, at the center of swirling controversies, conflicts, and clashes. In the meeting room of WCS's office in Flores one day, I watched as Julio displayed this "State of the Maya Biosphere Reserve" draft to a gathered group of NGO staff and visiting project funders. He clicked through PowerPoint slides of maps and data, presenting each one in brief, technical terms. After each slide, the rest of the room would erupt in detailed discussions about the political implications of the information, how, when, and where it might be used effectively, what kind of responses or shifts in strategy it implied, and even how the description of the data should be written in the final report, as Julio waited patiently, silently, for the room to indicate that he should move on to the next item. Calm, neutral, and quiet. As I watched, I realized that his behavior matched the way the data was to be read. And too, that this quietness that stood out so strongly in the NGO office was how I was always used to seeing him, where it didn't stand out, back in the computer lab at CEMEC.
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The office of CEMEC is a world apart. Where the streets of San Benito are hot, humid, and alternately dusty or muddy depending on the season, CEMEC is very cold – the air conditioner always blasting on high – and clean. Where people outside its doors weave a constant stream of conversation, preferring to run the same words over rather than be without talk, CEMEC is silent, an open room full of ten friendly people sitting next to each other with little interaction. Even the office’s receptionist is extremely shy and economical with her words, which emerge in near whispers much of the time. When visitors enter beyond the plywood barrier separating the reception area from the rest of the lab, they make rounds through the desks with hard-slapped handshakes and loud friendly greetings to the men, and gentler, more formal salutations to the women. The technicians smile, shake, and greet, then slide their gazes back to their screens, discouraging further intrusions. These visitors would usually then pull up a stool next to the desk of whoever was preparing a map or other request for them, lower their voices, and only a very few would interrupt again to repeat their rounds on the way back out.

For the first six months of my fieldwork, I would ride to and from the office in the car or on the back of the motorcycle of one of the technicians who were my neighbors, and we would chat through the ride, into the halls of CONAP, right up to the CEMEC office door. But stepping through the door, our voices would quiet, the conversation dropped until we stepped back out again for lunch, or at the end of the

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4 Visitors seemed consistently confused about whether or not to greet the office gringa. I was mostly awkwardly excluded from these rounds of greetings, which circled through every other desk one by one, or given a condescending and sexually charged acknowledgement by a few men.
day. Maybe one of us would issue a subdued 'good morning' to those already settled at their desks, but not always. When leaving, somebody might murmur 'see you tomorrow,' answered with a round of quietly echoed 'tomorrow's from a few desks, but not always. Outside the door, talk is the air Guatemalan sociality breathes; without it, the space inside CEMEC feels hollowed, hallowed.

*Mapping in the Morgue*

Early in my fieldnotes, I wrote this description: "There are no windows in the office, it is totally *encerrada* [closed in]. Used to be a hospital, Julio joked one day that CEMEC used to be the morgue." CONAP had indeed occupied a former hospital as its regional office, and the morgue jokes were recurring (though inaccurate). But it wasn’t the deathly cold atmosphere that I had gotten wrong. A couple of weeks later, another fieldnote:

I was wrong — there are windows here in the office! I noticed only because I heard an ice cream truck driving by, and smiled to myself because it plays the same song as in Canada. But wait, I realized, how do I hear it so clearly, if it's not coming in through the window. I turned around and sure enough there were four windows lining the wall behind me, shuttered and with turquoise curtains that almost exactly match the turquoise paint of the office walls. Perhaps it was this clever camouflage that kept me from noticing them before, although the room still retains a feel of being encerrada to me, even when I look straight at the windows. They are covered with curtains and also the translucent plastic blinds so common here, you can't see out, and the office's
artificial lights are brighter than any light coming through — it just doesn't feel like there are windows.

Even staring straight at openings to the wider world, CEMEC felt cut off, closed in, and separate.

Inevitably, of course, the outside would intrude rudely upon the abstracted space of the computer lab. One day the receptionist spent an hour or so carefully spooning the sugar next to the coffee maker from one container to another, sorting out tiny black ants. The entrance of visitors requesting data was the most frequent intrusion, and one that CEMEC's director, Ramos, complained about as a major disadvantage of their current office location; CEMEC had been located for several years in an independent office in Flores, far from the rest of CONAP, which greatly reduced the number of people physically entering the office to request information. This was a trade off, he told me, because it meant that less people were using their information back then – and that was the whole point of all this information, to be used – but the interruptions were fewer, the work smoother. He preferred the quiet.

But when I think about the occasional non-silent soundscapes of the lab, it is not voices (including of visitors) that come first to mind, but the beeping of backup warning systems that punctuated the frequent power outages. Loss of electricity occurs with extreme regularity, if unpredictably, in the Petén's urban areas. The computers in the office had backup power sources to prevent data loss, but not enough power to continue working when the lights went out. When this happened, people sat quietly at their desks, taking the moment to tap out a text message or get up
to refill their coffee, waiting as the air slowly thickened with heat without the air conditioner’s blast and the mid-toned beeps of the backup systems punctuated the silence in syncopated rhythms. Only if the power was out for more than a couple of minutes might a conversation start up — a funny story from the bar last night, chances on upcoming soccer games (with the office divided in loyalties between Barcelona and Madrid). Or, if there were high-pressure deadlines bearing down, Victor Hugo might take the opportunity to check in one by one with the progress of each technician on their work, or a few people might gather around a laptop with a reliable battery, working through a problem together aloud until the return of power scattered them back to their own desks.

On one particularly bad day in March, the electricity began flashing on and off every few minutes, for several hours. I had carried my laptop over to the desk of another technician, David, so we could work through a new animated mapping program together in parallel on our two screens. Each time the power dropped, the office would release a collective groan, while David and I tried to make our shared project work on my single remaining screen. After ten or so of these mini blackouts, David asked me, "this doesn't happen in the US?" "No!" I answered quickly and emphatically, causing the rest of the office to burst into laughter. "Only in Guatemala…" David replied with resignation, a reminder that despite CEMEC’s exceptionality, there was no escaping what lay outside the door.
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*Learning to Speak in Silence*

For months, I was overwhelmed by the obtrusiveness of my fieldwork in this place: to figure out what a technician was working on, I had to leave my assigned desk space – where I sat with my back to the room, my screen always visible – and intrude upon somebody else's. I had to make them remove their headphones, break their concentrated silence, and talk to me about what they were doing. And it did not take an outsider like me to notice the strangeness of the office (which was in fact entirely un-strange in terms of the computer labs or offices in North America with which I might compare). One of my opening interview questions for the technicians – what do you like most/least about working in CEMEC? – came back most often with answers about the silence, or the cold. The staff were divided over whether the silence was their favorite or least favorite aspect of working in the lab, some finding it satisfying to be able to focus on their own individual tasks, others – especially newer additions to the ranks – deeply uncomfortable.

Several also realized how it must be hard for me to do my project there, jokingly chiding me to keep quiet when I came and sat next to them at their desks, or commenting that I must be "bored" – which I politely denied, but was frequently all too true. Starting my fieldwork with six months in CEMEC also had serious consequences on my local socialization: my language skills, my ability to engage in the idle friendly chat necessary to make myself recognizable to most Guatemalans, not bizarre – these developed late, and only once I had made a friend good enough to
tell me bluntly: Micha, you don’t talk to anybody; they will think you are rude, a snob, or very strange. I learned first in the strangest place, to be silent.

I eventually also learned, however, how these silent Guatemalans were not rude to each other. After enough awkward intrusions into other CEMEC workspaces, watching technicians at their screens, I noticed that their Skype accounts were always open and popping up with chat messages — including from others in the office. Here was the sociality, sublimated into silent screens. Links to YouTube videos, coordination of shared projects, plans to hang out after work, requests for data, cute photos of their kids, all the regular office chatter happened over Skype. Once I figured this out, the world of the office opened up to me: I received an invitation to the wedding of one technician over Skype chat — I grinned as I responded, since she was sitting five feet away and facing me, but did not turn to answer her aloud. People
started spontaneously sending me maps and images they thought I might find interesting, and I found that it was suddenly easier to ask casual fieldwork questions in the course of a work day: who was that who just came in, what information were they requesting? All this seemed best to fit in the silent Skype box.

I eventually came to think of these silenced bodies as part of the technical infrastructure of CEMEC. It was more common among Guatemalans themselves to refer to field staff in infrastructural terms, such as the group of field technicians who one day proudly declared themselves to me as technology: "We are the remote sensors!" Similarly, it is easiest to think this way of the two CEMEC technicians devoted especially to GPS tracking – their bodies sent out into the reserve in pickup trucks, on dirt bikes, and on foot for multi-day treks, with the simple goal of reaching a particular location and pressing a button on their GPS unit to carry back to the lab and place onto a map. But even in the lab, the technologies of monitoring and map making shaped and changed bodies, silencing them, removing their eye contact or physical contact with each other, and moving the sociality of daily life through fingertips, keyboards, Skype, and screens rather than lips, tongues, and shared air.

It is not just the technologies that do this – working at a screen does not determine silence. CEMEC's newest hire told me that the last office he had worked in, a similar GIS lab in Guatemala's National Forest Institute (*Instituto Nacional de Bosques*, INAB), had always been filled with music and conversation. It might be partially due to the influence of Victor Hugo's preferences for uninterrupted quiet, though this too is not a satisfying explanation, since the lab's atmosphere remained
unchanged during his frequent absences. In the end, after asking again and again, why is it so quiet here? I decided that the why was not only unanswerable, but not the most interesting question. Instead, I started asking, might this silence have something to do with the stability, neutrality, and trustworthiness of CEMEC?

Cultivating Neutrality

For CEMEC is a world apart in this way, too – where the rest of the Guatemalan state is broadly understood to be treacherous, corrupt, and highly unstable, CEMEC is characterized by long-term stability and widespread trust and admiration. My fieldwork overlapped with the national elections of 2011 and transition to a new government in early 2012, processes that highlighted the widespread instability of state institutions other than CEMEC, including the regional CONAP office within which it is embedded. Since the 1996 peace accords, each presidential contest has resulted in the election of the second-place candidate from the previous round, with no party ever succeeding in winning two presidencies in a row (presidents themselves are limited to a single four-year term). As a result, the first thing every new president does is distinguish himself (all have been men) from his previous competitor, generally by undoing every major program they started and replacing the heads of all government agencies with their friends, supporters, and donors. These changes ripple down through the bureaucratic hierarchies to an unpredictable degree: the national director of CONAP always changes, and this person has historically always appointed a new regional director for CONAP-Petén. The new regional director then may or may not bring in "people they trust" to head up
the various subdivisions of the regional office, and so on. In some transition years, everyone down to the field technicians are swapped out, in others, the new regional director decides to retain those on hand for the value of their experience.

But over the years, CEMEC has never been affected – Victor Hugo Ramos has remained director since the lab's inception in 1997, and while he has had to fight to retain his full staff a few times, in the end the computer lab has been protected from the political changes that, at one time or another, have overturned all other departments of CONAP. This stability is partially due to CEMEC's co-administration by WCS – a protection due to both the presence of a known external ally and to the NGO as a source of financial buffering from budget changes inside CONAP. It is also partially due to the extremely technical nature of the work – there are very few Guatemalans with experience or training in remote sensing and GIS work, and even fewer with enough experience to step in as director of others doing this work.

So while CEMEC staff were anxious about the difficulties of the transition between governments, these anxieties did not extend to the security of their jobs, as it did for every other state employee. Instead, they worried about having to justify their work – particularly their budgets and requests for material support – to an entirely new group of people. Victor Hugo told me, "we're not as affected as other units, but there's always a bit of stress. We have to get to know the new people, and convince them that our work is useful, good for something… You can't tell what's going to happen, because you don't know who the new regional director will be, what their intentions will be, or their politics, their plans for administration." Another technician
told me he was worried about the transition because so many people always lose their jobs, but that he also knew CEMEC had always been safe from this threat, and that the only person who had ever left the institution did so of his own choice.

Even more striking than this institutional resilience was the widespread use and acceptance of data gathered and created by the lab's technicians. I would meet strangers in other contexts who, upon learning that I was working in CEMEC, would beam and spontaneously heap praise upon the office, telling me that they were "damned good at making maps!" (son cabrones para los mapas!), or launching into personal stories of how much one or another technician had helped them in their work. In 15 months of fieldwork otherwise filled with rumors, secrets, doubts, and constant undermining of truths, I heard only a single challenge to CEMEC's neutrality, from a tourism developer who suspected that the data in a GIS model of future deforestation might have been "manipulated" due to "bias." Even then, this challenge was not directed at the lab per se, but at the community-run forest concessions in the reserve, which he did not believe could protect the forest in the way that the model showed. Given the power of even CEMEC's most mundane work – the location maps – to determine land rights, development plans, and other highly contentious issues, this lack of accusations of bias, corruption, or political manipulation is truly extraordinary.

CEMEC often disappears in the rest of this dissertation, in part because of exactly this atmosphere of silence and individual isolation that I describe here as surrounding the lab’s daily work. The lab did not provide many exciting “vignettes”
with which to illustrate their data creation processes related to the themes and particular places described in the following chapters. Instead, I often end up describing knowledge-creation in general, depersonalized terms, or use quotes from interviews with technicians that are removed from the actual processes or practices of work. Making the dullness of this portion of my fieldwork explicit here is therefore more than just an attempt to explain the lab’s strangeness, but is also an explanation of why the lab itself so rarely appears in the following chapters. It’s disappearance in my own text is a product of the same dynamics that allow the lab to disappear from people’s considerations of its data when they use its maps and reports in their work and decision making.

Technoscience and Neutrality on a Violent Landscape

All of this technoscientific knowledge production happening in CEMEC at first looks so familiar: the publicly-available NASA satellite data, the ARCGIS computer program, the PowerPoint presentations. The quiet individual workers, working on their quiet individual projects. But the choice of what to map and who may see the maps is entirely different, and thick with threat. As I explore throughout the following chapters, the violence, inequality, and non-transparent forces that permeate daily life and work in the Maya Biosphere Reserve deeply shape what maps and reports CEMEC does and does not produce, because knowledge – the primary, proud, widely trusted product of CEMEC – is dangerous in Guatemala. As the old saying goes, ‘knowledge is power,’ and power in Guatemala is violent, hidden,
fractured, and deeply threatening. This leads to a paranoid epistemology, a kind of double vision in which knowledge is always haunted by terror of the unknown. This way of knowing is exhausting, exhaustive, terrifying and enlightening: there are always things too dangerous to say, and you must always listen carefully to others’ silences. Rumors and secrets come to seem more credible than things declared ‘transparent.’

Following the material semiotic work of John Law, Ann Marie Mol, and others, I consider CEMEC’s knowledge-making activities as enacting particular ontologies of the Maya Biosphere Reserve. The idea of enactment considers the way in which particular practices, including knowledge-making practices, enact multiple ontological realities, which come into contact or conflict in a variety of ways (Law and Mol 2008; Mol 2002). Unlike the multiple ontologies described by Law and Mol, however, CEMEC’s enacted landscapes do not stay neatly bounded and separate from each other, nor do their exclusions remain manageably in the realm of the unreal. If enactments occur through what Karen Barad (2007) refers to as "ontological cuts," my work attends to the ways that these cuts continue to bleed. As Barad’s work makes clear, epistemologies and ontologies are always mutually constituted (she uses the conjoined term ontoepistemology to describe their entanglements), thus the construction of knowledge embedded in a paranoid epistemology means that the ontologies enacted are themselves, in some sense, paranoid.

By “paranoid,” I am not speaking of individual or psychological pathology, but rather of a distributed political affect of fear and mistrust, in which the distinction
between things known and unknown is the source of dangerous power. In this historical, territorial, and political context, paranoia becomes, as Marcus (1999a) writes, entirely reasonable. It is fed by horrific news reports, and by the daily eruptions of violence that never appear in those reports – rampant domestic violence, muggings, public beatings, and other incidents heavily underreported due to widespread distrust in the police and justice system – not to mention the more subtle structural violence of extreme poverty and inequality. It is also fed by the regularity of death threats made against those working in state or NGO conservation institutions, in which those speaking politically dangerous opinions, or just accidentally patrolling the wrong park at the wrong time, might have to sweep their families into hiding at a moment's notice. These are key conditions that shape ubiquitous paranoia and suspicion in the Petén, but analysis of the political and epistemological effects of this paranoia cannot be limited to the simple explanation that paranoia is reasonable because sometimes stories turn out to be true.

To claim an ontology itself is paranoid is to acknowledge that rather than presume any ontological reality's ability to deny or exclude its alternatives, that each enactment in fact relies on its alternatives, on the always incompleteness of their denial and suppression, for the production of power, violence, and fear. Each enacted ontology is haunted by its excluded others, the incommensurabilities between worlds producing and reproducing the double vision of paranoia. As CEMEC’s knowledge making practices carefully navigate between unknown threats, the realities enacted by
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their technoscientific monitoring are shifting ground, haunted by their silences and exclusions, and begin to disintegrate almost as quickly as they can be constructed.

Another form of haunting comes from acknowledging the long histories of particular ontological enactments. If realities are enacted through practices, these practices can become embedded, sedimented, and iterative, re-inscribing particular versions of place, space, scale, and landscape again and again over time. Over time, the layers of these sedimented histories can be deeply at odds with each other or with newer realities, such they do not remain in the past but erupt into the present, haunting it. Because of the ways in which the many histories of the reserve, the Petén, and Guatemala are constantly interrupting current enactments of the Maya Biosphere Reserve landscape, I have chosen not to organize the historical content of this dissertation into a separate chapter or section of the introduction. Instead, particular aspects of the historical trajectories, memories, and hauntings of different aspects of the landscape appear throughout the text, interrupting the themes to which they most closely relate: for example, discussion of the late 20\textsuperscript{th} century colonization of the Petén appears in chapter 3, in relation to current enactments of human population; the scorched earth military tactics of the civil war appear in Chapter 4, alongside many other meanings and realities of fire. This movement back and forth between past and present, rather than presenting “history” as a contained and distinct realm of analysis, is intended to draw attention to the ways in which these histories continue to be present on the landscape(s) of the Petén.
Attention to the creation of these knowledges and ontologies on a paranoid landscape poses a challenge to common critiques of scientific or technical knowledge in conservation and development work, particularly the role of technoscience in depoliticizing deeply political interventions onto landscapes. These critiques focus on the discursive split between nature and culture or science and politics, arguing that this discursive structure evacuates all political claims from anything placed in the realm of nature, science, or the technical (see for example: Ferguson 1990; Forsyth 2002; Brechin et al. 2002; Adams et al. 2004; Li 2007; Fairhead and Leach 2003; Brosius 1999; among many others. For related critiques of conservation in the Maya Biosphere Reserve, see: Sundberg 1998; Ybarra 2012). At first glance, CEMEC's production of "objective," quantitative reports on a wide variety of ecological, social, and political factors perfectly fit this problematic model of what Tania Li (2007) refers to as "rendering technical." However, these critiques assume that both the producers and users of this technical knowledge are so deeply embedded within this hegemonic discourse that they do not or cannot recognize the inherently political nature of their "technical" problems and solutions.

What becomes apparent in Guatemala, however, is that a paranoid epistemology means that people are always listening to the silences where power is assumed to lie. Reading the silent politics that have been evacuated out of a technical report, then, is the natural and obvious way in which to read any technical report. As I argue, the case of technoscientific monitoring in the Maya Biosphere Reserve shows that it is not the separation of the technical from the political that poses a political
problem, but rather that desires for the kind of clarity promised by depoliticized technical documents shape both the production and use of these knowledges. As the following chapters will reveal, a close attention to the way CEMEC’s maps and reports are produced, distributed, and interpreted shows that every instance of depoliticization is carefully and conscientiously constructed with explicitly political ends.

This depoliticization is desired and necessary in a context in which knowledge is dangerous, and sharing that knowledge much more so. When knowledge moves, threat hangs heavy in the air: who might be listening? Where is the next threat coming from? The indistinguishability of the silence of protection (let us not say what might get us killed) and the silence of threat (let us not reveal our own ties to dangerous networks of power) perpetuate this distributed political affect of paranoia. There are things that I, as an ethnographer, will not say or write even now — names, places, events, and dangerous connections between them. I will not name them, nor name those who named them to me, and even acknowledging the fact of my own dangerous knowledge produces a shadow of terror in my own mind. I choose which stories and quotations to include carefully, wondering and worrying about whether or not those who were brave enough to share things with me will be safe, and too whether it will be safe for me to return. I walk a line between the safety of silence and trying to write stories that might make a difference.

CEMEC, too, walks this line: monitoring, mapping, and reporting carefully, balancing delicately between the dangers of knowing and the desire to have that
knowledge do some good. CEMEC's ability to enact landscapes as depoliticized technoscientific objectivity greatly facilitates the spread and acceptance of their knowledge, and they know it. The state-NGO hybrid lab sits as the eye of the storm, working always to maintain its stability, neutrality, and trustworthiness, and quietly — silently — turning out maps, reports, indicators, and statistics. They uphold representations of the reserve that enable clarity, defining problems and dynamics that everyone may know are not the biggest problem, but which still matter. By momentarily pulling single issues and questions out of the morass — fires, deforestation rates, population growth — as if they weren’t all tied together into the same unassailable confusion of competing realities, CEMEC enables action. These representations deliberately remove politics; this is not an unintended side effect of technocratic schemes, but a concerted effort to create moments of possibility at different scales and levels, always sidestepping the most dangerous or threatening problems on the landscape. The resulting depoliticized knowledge then moves quite successfully between institutions and up and down political and social hierarchies. People trust this knowledge, share it, praise its rigor and objectivity, and use it to direct their activities inside the reserve.

This knowledge moves across difference, with friction, certainly, but creating bridges, if only for a moment, across which connection can take place. The role of CEMEC’s knowledge in creating these bridges is explicitly recognized by many. One conservationist reported that over his many years working in the reserve, he found that different sectors had “completely different understandings of the way things are,
of the state of the reserve.” He told me that the ambitious State of the Maya Biosphere Reserve report, prepared by CEMEC, was going to be a powerful tool to build consensus, “to create a unified understanding of how things really are.”

Alongside their many direct applications, then, the lab’s reports are considered useful as a way of creating a momentary consensus about what the landscape *is*, if not of priorities or strategies in response. CEMEC’s enactments are more successful than any others in creating these moments of consensus or shared reality in the reserve, though they still never hold entirely. The following chapters detail many moments in which CEMEC’s data create these shared realities through which connection, action, and response can take place, as well as many others that reveal the limitations of those enacted realities, their (often literally) violent conflict with other ontologies, and outright refusals to engage with the “unified understanding” that this NGO worker prized.

**Knowledge into Action: Co-Producing Conservation**

CEMEC’s enactment of a coherent, bounded "reserve" simultaneously co-produces the state (and state-like agencies) that are responsible for its management (S. Jasanoff 2004). This reserve object solidifies state control, management, and definition of a landscape that is otherwise a highly varied patchwork of management zones, competing state and non-state institutions, ecosystems, and human dynamics.

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5 The co-production of the Maya Biosphere Reserve and CONAP as a state agency was historically quite literal: the government body was created by declaration of the same law that established the reserve in 1990.
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Asking people to describe the reserve as a whole inevitably leads to answers broken down into smaller geographic pieces: the forest concessions are probably doing OK, Laguna del Tigre National Park may already be lost, etc. Imagining the reserve as a singular object is difficult, but the maps and monitoring reports from CEMEC, with their solid repetition of the familiar outline shape of the reserve, work to make this imagining possible.

Objects enacted are also always actors, and the particularity of ontological enactments makes a difference (Law and Mol 2008). Following this, the question becomes: what can an enormous biosphere reserve do that a collection of smaller parks, villages, and timber concessions cannot? For one thing, it can participate in globally recognized models of conservation and development that attract major funders, such as the UN "Man and the Biosphere" program within which the reserve was designed and developed. It can also facilitate state control over areas of territory that are otherwise difficult to claim or manage – and the Petén has historically been exemplary of these difficulties (Sundberg 1998; Gould 2006). While this state control may not always be enacted on the ground, repeated declarations of rules, regulations, and boundaries clarify that this lack is an administrative, not an ontological one: a reserve is state land, whether or not the state manages it well.

The momentary appearance of a clear reserve object provided by CEMEC’s reports therefore enables conservation action to occur, on the part of the state, NGOs, and other actors. But the apparent stability and clarity of these enactments never hold for very long against the violent intrusions of the many other realities, the landscapes
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of hidden threats and historical impunity. As a result of the contingent, partial, and unstable nature of these enacted landscapes, the actions and responses undertaken on the basis of this official knowledge end up reactive, contradictory, haunted, and deeply incoherent. Many examples of this dynamic appear in the following chapters: maps of state presence on the landscape haunted by an utter lack of efficacy or accountability associated with that presence; annual agricultural fires haunted by the violent uses of fire during the civil war; technological models of the future haunted by the ongoing impunities of the past; declared conservation successes, like protected forest cover, haunted by the incoherency of a multitude of actors and institutions working at odds with each other.

Ultimately, however, this apparent incoherency and ad hoc nature of conservation in the Maya Biosphere Reserve is in fact deeply coherent when acknowledging both the prevalence of violence and its unpredictability. Conservation actions are oriented not towards an abstract evaluation of best practice on a single coherent landscape, but towards a carefully calibrated tightrope act walking the line between efficacy and danger. And this is not exceptional – most conservation projects around the world take place in similarly violent, unequal, and haunted landscapes, crowded with too many possible worlds to ever settle on a best practice or ultimate solution. The stories of monitoring, mapping, and conservation interventions in the Maya Biosphere Reserve that follow throughout this dissertation do not represent an isolated or exceptional case, but rather one instructive for thinking through the
complex dynamics of environmental knowledge and action in contexts of instability, inequality, and violence around the World.

Much of the anthropology of conservation, particularly in the Global South, has critiqued protected areas and related conservationist projects as a kind of wolf in sheep's clothing – where the wolf is variously (neo-)colonialism (Chapin 2004; Bray and Anderson 2005), state territorial control (Berger 1992; Sundberg 1998; Bryant 2002), ethnic exclusion (Sundberg 2003), or most recently, the new "big bad" – neoliberalism (West 2006; West et al. 2006; Bebbington and Thiele 1993). These critiques are important, and there is no question that global "nature protection" discourses and environmental NGO structures greatly favor the priorities and politics of the Global North over local needs, histories, or complex relationships with the "biodiverse" environments in question. Indeed, every single one of the listed “evils” that might be hiding within conservation are present in the Maya Biosphere Reserve, along with the further evil of the post-war re-militarization of the landscape, which Megan Ybarra (2012) has written about in the Petén. At the same time, both Guatemalans and foreigners working in the reserve are very aware of these critiques, and struggle explicitly with these questions in their own decision-making and practice.

In my work, then, I too take these critiques seriously, but resist the temptation to write off nature conservation as a totalizing project, attending instead to the ways that people working in the reserve enact conservation as a contingent and shifting set of discourses and practices, attempting, against incredible odds, to shape a landscape
that might be hospitable to both humans and the many non-humans that make up its tropical lowland forests. At the same time, the constant paranoid shifting between ontological frames results in both environmental knowledge and conservation actions that are shifting, frantic, contradictory, and haunted. What this case contributes to thinking about conservation around the world is a recognition that the conflicts between multiple ontologies do not always map onto a division between conservationists and locals, as is usually framed, and that many of the depoliticizing moves of technical environmental discourses are not naïve, but carefully crafted for political effect, and to enable some kind of action.
CHAPTER TWO
Mapping Gobernabilidad

"Es una pelota entre un montón pero de nadie"

On May 16, 2011, on Los Cocos ranch in central Petén, 27 poor farm workers were brutally bound, tortured, and beheaded. Straight out of a horror movie, a gruesome message was left written in their blood in two-foot tall letters on the side of a farmhouse, warning the owner of the farm that Z 200, part of the Mexican drug cartel the Zetas, was after him. Within 24 hours, President Alvaro Colóm declared a “state of siege” (estado del sitio) in the Petén, and the department was flooded with heavily armored military vehicles heaped with uniformed men carrying machine guns. While the impact of spot checks, new rules on carrying weapons, and increased law enforcement presence reportedly had little lasting impact on narco activities and other serious crime, smaller offenses like motorcycle theft dropped precipitously.
Tourists visiting nearby Mayan ruins who were staying in the quiet island town of Flores where I lived — about 60 miles northeast of the massacre — were terrified by the news, and even more so by the sudden proliferation of army trucks trundling over the narrow cobbled streets throughout the day and night. Almost immediately, the tourism industry's steady stream of visitors dropped to a bare trickle.

The state of siege continued for three months, after which it was downgraded to a “state of alarm” and then extended, 30 days by 30 days, well into 2012. Over the same period, National news reports were following the trial of four former Kaibiles, members of the Guatemalan special forces, eventually convicted of crimes against humanity for their participation in the 1982 massacre of over 200 people in the village of Dos Erres, part of the military's scorched earth campaign during the civil war. What made this doubling particularly haunting in 2011, as both stories cycled through daily news reports, was that Dos Erres and Los Cocos were located very close together in La Libertad municipality, not far outside the borders of the Maya Biosphere Reserve's buffer zone. The echoing of mass murder tactics in these two cases, separated by thirty years, is no coincidence — ex-Kaibiles are heavily recruited by the Zetas, who originated from a similarly trained elite forces branch of the Mexican military.

On the day of the Los Cocos massacre, all government offices in the Petén were closed due to possible bomb threats, including CEMEC's computer lab in which I was carrying out fieldwork. Two days later the threat was declared clear, and CEMEC technicians and I regathered in the office, the staff breaking the tension by
cracking jokes about the bomb threats and referring to the surrounding streets of San Benito and Santa Elena as “pure Baghdad.” “Watch out!” One technician, David, teased another. “If you make a map of the landing strips, they'll come cut your head off!” Laughing, another responded that one day the Zetas are just going to stroll into the office, politely asking for a base map of the reserve (mapa base, a broad-scale general reference map). It wouldn't be a base map, David corrected authoritatively, they'll want una hoja cartografica (detailed area maps including fine-scale topographic data). Turning to me, his tone more serious, he clarified that this was really a joke: “but they have good maps, the Zetas. They already have really good maps.”

A week later, a Kaibil came striding into CEMEC. A fit, handsome middle aged man with a machine gun strapped to his hip, he requested large printed maps of the western regions of the reserve, particularly Laguna del Tigre and Sierra del Lacondón National Parks, rolled them up under his arm, and strode out again. As he left, a Skype chat from CEMEC’s director popped up on my screen:

Victor Hugo Ramos: Scared?
MR: Yes and no… I don't like guns.
VHR: Yeah, me neither
MR: What did they want? General maps of the area? I'm a little surprised that the military doesn't have excellent maps of the whole state
VHR: That's how it is. They always ask us for maps. Always. The maps they have are from the 1960s.

Despite the strong statement about state power and territorial control made by rolling tanks through the streets of Flores, actual military knowledge of the territory of western Petén was apparently fifty years out of date. The contrast with David's
confidence about the Zetas' maps is striking, and closely tied to the general sentiment that the Petén, like other pieces of Guatemala before it, was now Zeta territory.

The Doubled Nature of Gobernabilidad

Bodies, tanks, maps — each of these appear here as technologies of territory, marking presence and power in ways both shocking and mundane. I open with these interwoven stories of violence, the state, and mapping work in CEMEC to begin to explore the question of gobernabilidad in the Maya Biosphere Reserve. Throughout this chapter, I leave the Spanish term gobernabilidad untranslated in order to allow its double meaning made up of two co-constituted opposites: governability and governance. First, governability describes a characteristic of the landscape itself: the reserve's tangle of thick jungle, swampy wetlands, and densely layered histories of violence, inequality, and marginality. Here Guatemala's problems with organized crime, human and drug traffic across the border into Mexico, and both extraordinary and mundane violence compete with international imaginings of a pristine nature.6 Second, governance describes state (and non-state) efforts at control over the landscape, as well as transparency and accountability for the actions comprising that control.7 The single term gobernabilidad was used for both of these entangled

6 Of course, the complex non-human worlds of the reserve’s landscape are also un-governable in many ways: the ranging of endangered predators like jaguars out of the forest onto nearby ranches where they are shot in defense of cattle; the unpredictable vagaries of global climate change or regular climatic fluctuations like el niño; the violent incursions of hurricanes. These elements contribute to institutional senses of powerlessness and lack of control, though I do not have space to fully attend to these non-human worlds in this chapter.

7 This definition is different from typical discussions of (environmental) governance in academic literature, and represents my analytical separation of the emic uses of the
opposites in the Petén, such that when somebody was speaking it was often unclear whether they were describing a problem (governability), the response to a problem (governance), or the relationship between the two.

There is increasing pressure on the Guatemalan state, as well as the many NGOs working in state-like capacities in the reserve, to demonstrate measurable improvements in gobernabilidad through a combination of institutional and financial transparency and active responses to threats on the landscape. As a result, CEMEC technicians have recently started producing maps and reports of newly constructed indicators of gobernabilidad, particularly linked to several large neoliberally-inflected grants given to CONAP and NGOs. These indicators tend towards a quantification of gobernabilidad (evaluated as more or less, not good or bad) that appears to shift questions of concern away from efficacy or justice and towards a simple metric that elides the changing roles of the state, NGOs, and other actors, or state responsibilities such as whether and how to provide health or education services to people living illegally inside the reserve. However, while these reports on gobernabilidad are on the surface depoliticizing, a close attention to how these data are produced, distributed, and interpreted in different contexts reveals that this depoliticization is in fact carefully crafted for maximum political efficacy.

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term gobernabilidad in the Petén rather than any formal definition. There is also a distinct Spanish term for governance, gobernanza, but it was not typically used. The only example of the term I encountered was on one of CEMEC's maps, entitled "Tipos de Gobernanza" (Types of Governance), defining the legal administrative regimes for different zones of the Maya Biosphere Reserve (figure 2.1).
Violence and organized crime are a part of daily life and work in the reserve, but largely invisible except in moments of spectacular eruption like that of May 2011.\textsuperscript{8} The proliferation of organized crime, particularly drug cartels, shares geographic space in western areas of the reserve with land-grabbing cattle ranchers, illegal loggers, archaeological looters, and poor agricultural migrants. The differences between these groups are never immediately apparent, as could be seen in the days after the slaughter at Los Cocos, in which broad public speculation wondered if those killed were \textit{really} innocent migrant farm workers, or whether they were cleverly disguised members of the drug trade. This probing for hidden threat, identity, or connection reflects the widespread fear of duplicity (\textit{engaño}), which Diane (Nelson 2009) describes as permeating post-war Guatemala.

The state's reaction to the sudden visibility of narco gangs was to respond with an immediate increase in its own visibility, especially of military presence in the region, a spectacle of statehood that had little to do with actual control of criminal activity — particularly when the trucks paraded around the edges of Flores, the quaint and quiet island capital of Petén. This presence carried its own invisible echoes of the human rights violations of the military during the civil war, in which the Petén was one of the regions hardest hit by genocidal violence (Egan 1999). In this way, the doubled nature of gobernabilidad is also always haunted by the historical violence — still unaccounted for — of the state itself. The 36-year long war that officially ended in 1996 was an era of Guatemalan life in which the violence by, for, and against the

\textsuperscript{8} The slaughter at Los Cocos was outside the reserve's boundaries, but drug trafficker presence and land grabs are well known inside the reserve.
state became indistinguishable, as civilians were alternately slaughtered and forced into collaboration with military violence against their own communities and families (Manz 2004; Nelson 2009). Guatemala's current president Otto Perez Molina – elected shortly after the Los Cocos massacre on a tough on crime platform – is a former general with close ties to this historical violence, who continues to deny that genocide was ever committed even as his former colleagues are put on trial for these crimes against humanity. This denial of historical responsibility, combined with present day corruption and connection to organized crime within the government, doubly undermine state claims to legitimate authority.

CEMEC’s monitoring and mapping of gobernabilidad in the Maya Biosphere Reserve responds directly to this confusion, attempting to redraw the blurred lines that Guatemalans have come to inhabit and enacting clear boundaries between violence, lawlessness, and hidden dealings on the side of cattle ranchers and drug runners, and transparency, accountability, and right action on the part of the state. However, as David's joke about being beheaded for mapping drug traffickers' landing strips demonstrates, there is danger in this work, and some things simply remain under cover. The lab's knowledge production must carefully navigate a landscape where threats, interests, and connections between them are uncertain, and the appearance of their resulting maps and reports of gobernabilidad as quantitative, objective technoscientific knowledge is essential to their movement and use in a wide variety of contexts. At the same time, the avoidance of too much dangerous specificity, the haunting of historical impunity, and the production of clarity for a
CHAPTER TWO: Mapping Gobernabilidad

landscape that is anything but clear lead to enactments of gobernabilidad that are shifting ground, carrying their exclusions and silences with them, and resulting in conservation strategies and interventions that are contradictory, incoherent, and themselves deeply violent.

While a full discussion of violence, crime, post-war state formation, and the inefficacy of Guatemala's justice system are far too extensive for me to address here (but see Nelson 2009; Grandin 2005; Sieder 2011; Brands 2010; Musalo, Pellegrin, and Roberts 2010; Sanford 2003; Howard, Hume, and Oslander 2007), I will use this chapter to sketch an introduction to how these issues overlap with the world of conservation in the Maya Biosphere Reserve. In particular, I will examine the constructions of gobernabilidad emerging through three closely related spheres: CEMEC practices designed to monitor and map it, major international grants and their associated NGO projects dedicated to improving it, and inter-institutional work on “environmental justice”.

The first two sections of the chapter will describe the institutional landscape of the reserve, exploring the shifting roles and responsibilities of the military, other state agencies, and NGOs, and then how these dynamics were highlighted in particular by the 2011 national elections and the transition between governments in early 2012. Following this, I will examine the careful construction and presentation of CEMEC's official measures of gobernabilidad, analyzing both the

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9 “Environmental justice” carries a very different meaning in the Petén than in typical United States usage: it refers to the pursuit and prosecution of environmental crimes, defined as those that break protected area laws (illegal logging, land usurpation, archaeological looting, etc). The category is often extended to include violence or threats of violence as retribution against environmental or conservation actors, including retribution for reporting other environmental crimes.
depolarization of these reports and their (intended and unintended) political effects, particularly how the mapping of gobernabilidad shapes local understandings of which problems, violence, or crimes merit what kinds of attention or response. Finally, at the end of the chapter I turn briefly to attempts to respond to these problems and improve gobernabilidad, highlighting the complex relationships between knowledge, power, violence, fear, and conservation interventions.

To explore these issues, I draw particularly on three projects: 1) the development of an inter-institutional Environmental Justice Forum (Foro de Justicia Ambiental); 2) a USAID grant devoted to improving gobernabilidad in the reserve, administered through cooperation with the U.S. Department of the Interior (herein the DOI project); and 3) the “State of the Maya Biosphere Reserve” (Estado de la Reserva Biosfera Maya) project, funded by the U.K. Department for International Development (DFID), an attempt to create a comprehensive social, economic, and ecological description of the reserve (including detailed measurements of gobernabilidad) to serve as a baseline against which to measure future conservation and development interventions. These projects were closely related, both in theme and in practice. In fact, some major goals and activities in the DFID and DOI projects were so similar that the institutions carrying out the projects had to be extremely careful in their reporting and accounting practices, ensuring that they did not double-charge their funders for a single activity. The Environmental Justice Forum was a separate effort independent of any single funding source, but was supported in part by both DFID and DOI project funds. The goal of the Forum, which was in the early
stages of planning and development in 2011, was to provide a venue for improved
reporting (denuncios) and prosecution of environmental crimes, particularly designed
to protect those pursuing cases from retaliation, a major problem in the reserve.

The State and NGOs in the Maya Biosphere Reserve

Who is responsible for gobernabilidad? The word’s root seems to imply an
easy answer, but in practice the Guatemalan state is extremely underequipped to
perform many of the activities typically ascribed to governments and their
bureaucracies, and non-governmental actors — Guatemalan or international; non-
profit NGO or private corporation — pick up much of the slack. In the Maya
Biosphere Reserve, the lines between state and non-state are particularly blurred,
leading to its characterization as an “NGO landscape” in the 1990s (Sundberg 1998).
While CONAP is the government agency officially in charge of the reserve (and all
other Guatemalan protected areas), many areas of the reserve are now or were
previously legally co-administered with other institutions: the biotopes with the
Universidad San Carlos, and several national parks with NGOs. There is also a
municipal reserve with community-based co-administration, and the Multiple Use
Zone concessioned out to community organizations and industrial logging companies

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10 The outsourcing of governance, particularly to NGOs in environmental contexts, is extremely common across Latin America (Bebbington and Thiele 1993).
11 “Biotopes” (biotopos) refer to special protected areas indicated for education, research, and preservation, and managed by the national University of San Carlos. These pre-existed the MBR in the Petén, and when overlaid with National Parks, created not a shared, but technically a doubled, administrative structure.
that take primary responsibility for management and protection, with CONAP oversight. Currently, 55% of the reserve is considered to be under single administrative control of CONAP, but this figure excludes the 24% of the reserve’s area in the buffer zone, in which CONAP and other conservation activity is essentially absent (figure 2.1).

To complicate things further, the funding structures of many of these government and NGO institutions are tangled together, so even state institutions are not always entirely “the state” — CEMEC’s co-administration by WCS is a key example. Several attempts were made in 2011-2012 (by myself and others) to come up with general estimates of the funding flowing into the reserve, past and present, all with minimal success. In many cases, large grants or loans would publish total...
figures, but leave unreported the distribution of these funds across state and non-state institutions, different regions, or sub-projects. Even requests for ostensibly public information, like USAID grants or Guatemalan state budgets, resulted in contradictory and incomplete figures. For example, one simple goal of the DFID State of the Maya Biosphere Reserve project was to figure out if Guatemalan government funding for the reserve had increased or decreased over time — information that should, in theory, have been public, transparent, and accountable. In practice, however, this data was extremely difficult to locate, with contradictory figures reported from granting and grantee agencies, leaving actual numbers perpetually in doubt. If even very general totals like these are hard to determine, detailed information revealing how money has actually been spent in particular projects or agencies is left purely in the realm of wishful thinking.

Recent literature on states has focused precisely on this blurriness, emphasizing that states, rather than being autonomous and bounded institutions, are in many ways composed of the practices and discourses that draw boundaries between state and non-state (Mitchell 1991; Bebbington 2008; Gupta and Sharma 2006; Miller 2004). In the Maya Biosphere Reserve, CEMEC’s reports on gobernabilidad are key among these boundary-building practices, literally mapping out the presence, responsibilities, and influence of different institutions on the landscape. The apparent clarity of these maps and reports, however, is continually challenged by the confused, amorphous nature of power in post-war Guatemala. For example, the above map of legal administrative regimes in the reserve does not include the many informal areas of
influence and de facto administrative power of non-CONAP institutions (including the army, the National Institute of Anthropology and History/IDAEH, or NGOs like Asociación Balam or FARES), nor does it reflect the now defunct co-administrative regimes that historically were part of the reserve, or those under negotiation to begin soon.

All of this boundary-blurring between institutions can leave some uncomfortable, especially foreign visitors new to the reserve. One visiting researcher working with Defensores de la Naturaleza, the Guatemalan NGO responsible for co-administering Sierra del Lacandon National Park, told me that after two weeks in the office she realized that half the people working around her were in fact part of CONAP, not the NGO; she reported that it was impossible to “really tell who is who.” But among those who have lived or worked in the Petén for longer, the impossibility of locating a clear state/non-state boundary is taken for granted. In fact, while the many administrative and financial overlaps between state and NGO actors in the reserve make clarifying the roles and responsibilities of different institutions a murky business, this murk can be exploited.

For example, in multi-institutional negotiations with one village in the reserve, an NGO was insistent on prioritizing the removal of cattle from the community (illegal, but previously tolerated in small numbers), knowing that it would be CONAP that would shoulder the responsibility of actually enforcing this rule. WCS and some other NGOs avoid taking on official co-administration of parts of the reserve for this reason; refusal of legal responsibility allows more flexibility in strategy, timing, and
negotiations, while leaving the burden of long-term protected area management and difficult enforcement work to the state. Instead, WCS — emphasizing its place as an international, not a Guatemalan organization — seeks an “NGO accompaniment” model of shared responsibility, without “substituting” for the state or taking over its key functions (though of course, as the example of co-administering CEMEC demonstrates, where this line gets drawn is strategic rather than ideological).

Neoliberal Governance

A word on a word: neoliberalism. Most of the topics and themes in this chapter — from the “good governance” priorities of international agencies to the blurring of state/non-state boundaries — are often analyzed through a focus on the spread of neoliberalism. In Guatemala, the transition to a neoliberal state is often located with the 1996 peace accords ending the civil war, as the accords provided not just an end to conflicts between the state and guerrilla factions, but also structural adjustment to taxation structures, economic development, indigenous and human rights, agrarian reform, protection of natural resources, and ‘streamlined’ government (Blum 2001; Wittman and Tanaka 2006; Robinson 2003). These reforms

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12 What is meant by ‘neoliberalism' can be slippery: it can refer to a global economic model, a specific set of policies implemented by multilateral institutions beginning in the early 1980s, or a range of political philosophies with particular ideologies of personhood, property, and agency. It is the presumed foe of many social and political movements across Latin America, as well as of dominating the work of many scholars working there. While David Harvey's fundamental work on neoliberal globalization acknowledges uneven distribution of effects across the world (Harvey 2007), it (and many other works) still assume a largely unitary global neoliberalism. But in Noel Castree's (2008) review of critical geographic work on the neoliberalization of nature, he notes that the term is used to refer to vastly different and often fundamentally incomparable situations.
overwhelmingly prioritized market-based, decentralized approaches, and opened
Guatemala to new degrees of influence by major multilateral organizations.

The structure of the peace accords opened up greater political space for
partnerships between the Guatemalan government and international NGOs such as
those now seen to dominate the MBR, as well as encouraging the proliferation of
new, smaller Guatemalan NGOs (Blum 2001). Dependency on international donors
quickly became the standard model for these Guatemalan organizations, which then
had to institutionally adjust to meet these donors’ demands — a trend that continues
with current emphases on gobernabilidad and transparency. This process reshaped a
wide variety of local agendas into a single liberal democratic model, leaving many
Guatemalan organizations feeling that their accounting and reporting practices were
of much greater importance than the quality or nature of their work (Pearce and
Howell 2002). Of course, as NGOs take on many former state roles, they are in fact
often less transparent and institutionally accountable than governments, and therefore
criticized as less democratic (Bebbington and Thiele 1993; Ribot and Larson 2005).
But given frequent disavowals of functional democracy in Guatemala (the
government is not transparent or accountable, either) this critique does not capture the
complexity of the Petén's institutional landscape.

The large burden of responsibility for traditionally state functions now placed
on NGOs in Guatemala can certainly be attributed in part to the structural weaknesses
of the post-war government, particularly the extraordinarily low tax rate maintained
by the political power of the traditional oligarchy/elite. In one project meeting, an
argument erupted when a visiting DOI representative asked why CONAP never picked up the bill for shared multi-sectoral meetings. The explanation, that they simply couldn't afford it, led back to Guatemala's tax base: “the lowest in all of Latin America!” one man proclaimed. “The way things stand,” he continued, “it's close to a failed state” (estado fallado). Another Guatemalan jumped in to defend his country, arguing that the strength of the executive branch in defining direction and leadership was more important than the fact that there was barely enough money to cover basic functions. Ultimately, this argument concerned what a state is, or should be — a strong presidential figure, or a complex set of bureaucratic regimes and institutions? If the latter, Guatemala's state is indeed, in many ways and places, a failure.

*The State of Siege and the militarization of conservation*

Spectacular displays of military power, like the 2011 state of siege in the Petén, are one way of responding to these anxieties about a failing state, and people working in the Maya Biosphere Reserve attempted to take advantage of this temporary bolstering of state power for environmental purposes. Behind closed doors, conservationists debated the differences between taking military action against land invasions linked to the Zetas or the Sinaloa drug cartel, or those carried out by poor campesinos — and, importantly, how they could be sure of the difference. Despite frustrations with a disconnect between the stated purpose of the State of Siege (to deal with narcotrafficking presence) and the apparent actions being taken (arrests for minor non-violent crimes, with people held for 15 days then released), some conservationists attempted to find narco-linked environmental cases through which
they might enlist the help of the militarized state to oust problematic presences in the reserve.

This desire to use increased military presence was not only haunted by the State of Siege’s inefficacy and emphasis on appearance over action, but also by the military's notoriety for brutal human rights violations during the civil war.\textsuperscript{13} As a meeting between NGO\textsuperscript{14} and CONAP staff tried to figure out how to turn the State of Siege to their advantage, they also asked after rumors or reports of rights violations. While people had many stories of intimidation and fear, no one had heard of outright human rights abuses, and all agreed that fear was not the same thing and would in fact be inevitable when the military was involved. In the end, the potential consequences of aligning too closely with a historically problematic military, as well as the acknowledged inefficacy of that military's current actions, meant that this group of conservation workers decided not to pursue state of siege actions in the reserve.

Desires to work with the military — whether or not those desires are eventually translated into action — represent a major shift in public perceptions of the Guatemalan Army since the peace accords. Conservationists working in the reserve expressed hesitant changes of opinion about the military. Even some people who historically were firmly located in an anti-army camp in Guatemala, during the civil

\textsuperscript{13} Conservation in Guatemala, too, has been accused of human rights violations, through a parks vs. people conflict framing. Many of these accusations are well-based, while other actors use the discourse of human rights to undermine protected area law and secure illegal land. The complexities of this question are covered more extensively in Chapter 4.

\textsuperscript{14} NGOs do not usually cooperate directly with the army, but are heavily involved in communicating areas of need and priority to CONAP, who then direct associated armed forces.
war and in the 1990s when the military served largely as protection for petroleum interests in the Petén, will now laud the army's commitment to and support for conservation. One NGO staff person told me how in the 1990s he suspected he had been the target of a covert military hit, but that the army of today was a very different thing, aware of the environmental dynamics of the reserve. He qualified this statement by adding that perhaps the military had just learned to use the language of conservation, similar to local community members who “speak conservation” in order to get access to resources. But especially in contrast to the police, whom one American referred to as “rolling sacks of corruption,” the army has gained many conservationists’ respect for its effectiveness, discipline, and ability to follow through on planned actions in the reserve.

This shift in perception plays into current trends towards militarizing conservation in the reserve in complex ways. The Kaibil striding into CEMEC in the opening of this chapter is a potent image for this militarization, and army presence is increasing year by year in the Western National Parks of the reserve, including a special “Green Battalion” declared in 2010 especially for Laguna del Tigre Park (see figure 2.4). At the same time, local awareness of critiques of militarization of conservation in the reserve (see Sundberg 1998; Ybarra 2012), and of the effects of civil war memories in local communities (particularly indigenous migrant villages or returned-refugee communities near the Mexican border), led to careful reflection on any alignment with the army in conservation efforts. In a 2011 public meeting, the
director of CONAP-Petén, Mariela Lopez, responded directly to these concerns, defending the inclusion of the nature protection division of the national police (División de Protección de la Naturaleza — DIPRONA) and the army’s Green Batallion forces as “importantísimo” (extremely important). She said:

There are many who say that the Maya Biosphere Reserve is being militarized. And what we have said to this is that those of us who are here, those who know the area well, we know that for any project we want to carry out we first have to have gobernabilidad … There are many sectors that say that CONAP, well, it's a technical institution, and we shouldn't get involved in the matter of gobernabilidad. But it's part of our mandate within Protected Areas.

As Megan Ybarra (2012) has analyzed, this call to gobernabilidad reinforces the discursive links between conservation and historical military action in the Petén, both based on a territorial defense of forests against agricultural and other incursions. However, while the militarization of conservation is an increasing and problematic trend in the many parts of the reserve, it is not all encompassing; in many areas, institutions, projects, and scales, non-militarized conservation interventions still hold sway.

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15 Lopez was promoted from regional director of CONAP-Petén to national Executive Secretary of CONAP in fall 2011, so she and others appear in both roles throughout the text.
Developing the Environmental Justice Forum

The development of the new cross-sector Environmental Justice Forum, a space to increase prosecution and accountability for environmental crimes in the Petén, was one such attempt to create a non-military response to violence and other problems in the reserve. However, the development of the Forum was a challenge in the reserve's complex institutional landscape, with tension between which bodies were technically responsible for governance (typically the state) and which were most likely to be effective in accomplishing the Forum’s goals (NGOs). The legal and administrative structure of the Forum was as yet undetermined in 2011: would it be an independent foundation? A Guatemalan civil society organization? A “civil association,” made up of representatives from other institutions? Key to these questions was whether the Forum would be composed of individuals or organizations, and the implications of this decision for political and personal power and vulnerability. In planning meetings, organizers struggled with the complexities of these issues, asking: would the Forum be more effective if backed by already influential non-governmental institutions? Or would official participation in the Forum pose challenges for these NGOs, treading even deeper into the problematic overtaking of state responsibilities for governance? This confusion of roles and responsibilities, even in the conceptual development stages of the Forum, were succinctly described with an inevitable soccer metaphor: “[The forum] is a ball being passed around among many, but belonging to nobody” (Es una pelota entre un montón pero de nadie).
Similarly, the search for an Executive Secretary of the emerging Forum was simultaneously a simple and contentious issue, reflecting ubiquitous tensions between formal (transparent, accountable) and informal (social networks) modes of politics. As this leadership position was being defined, the planners had a particular individual in mind for whom they were shaping the position and its qualifications. But the emphasis on the Forum as an opportunity to build more open, democratic, and participatory justice structures in the reserve meant that the position would have to be opened to a public selection process, contradicting the process of describing qualifications around a known person. Those involved in this process were anxiously aware of this contradiction, struggling to counteract non-transparent political action while simultaneously engaging in it themselves.

**The 2011 Elections and the Institutional Politics of Stability**

The national elections of 2011 brought all of these tensions to a head. The choice between the two leading presidential candidates was widely interpreted as a choice between bad and worse — Otto Perez Molina, a general closely tied to the brutality and scorched earth policies of the civil war, and Manuel Baldizón, a charismatic Petenero business mogul locally called a “thief” and a “narco.” A favorite Petenero past time during the campaign was speculating on the horrors of a Baldizón-led Guatemala, including his true (hidden) political ambition to restructure the presidency once in power, removing term limits and opening the way to a dictatorship. As Julian, a field technician for a Guatemalan NGO, told me, “it pains
me to vote for a military man, for somebody who committed genocide. But Baldizón… I despise him with all my soul. The only thing I hope for is that [Perez's] military patriotism will keep him from completely destroying the country.” Among Peteneros working in conservation, a genocidal general was considered preferable to Baldizón's darkly rumored plans\textsuperscript{16} — a choice between a duplicity of the past (Perez's continued denials that genocide occurred in Guatemala) over one that lay in the future.

Perez won the election on the popularity of his repressive \textit{Mano Dura} (tough on crime, literally “firm hand”) political rhetoric, broadly popular in the face of increasing murder rates, gang activity, and narcotrafficking.\textsuperscript{17} But Baldizón is widely expected to win the next election in 2015, following Guatemala's “rhythm”: since the 1996 peace accords, the runner up from each presidential election has won the following one. “He will be president,” Julian told me, “100%. Not this time, but he will be president.” Given this resignation and perceived inevitability, many people's reaction to the elections was simply to express a fundamental disbelief in democracy, arguing that the campaigns were all personal fights and payouts, without a politically informed electorate able to make knowledgeable decisions. This was a well-founded

\textsuperscript{16} Baldizón carried the election in Petén by a wide margin, but I did not encounter a single Petenero working in CONAP, conservation NGOs, or elsewhere who claimed to vote for him. Instead, these people explained his local victory as a product of either duping the local population with his charismatic promises and exorbitant media campaign (see Nelson 2009 on narratives of duplicity), or as a result of vote buying, such as by providing new tin roofs to rural villages in exchange for political support.

\textsuperscript{17} Mano Dura politics have become popular across Central America, a backlash to the high rates of violent crime generally attributed to gang activity. For an excellent comparative case, see Moodie’s (2009) analysis of Mano Dura in El Salvador.
critique; for months the top political news story was an unfolding drama in which Sandra Torres, the widely popular wife of outgoing president Alvaro Colóm, declared that she would run for the office — a move banned by the constitution (immediate family members of the president are excluded from competition). The scandal erupted when she and her husband suddenly divorced in an attempt to sidestep the regulation, although the Supreme Court eventually decided against her. During the period in which she was technically running, there was little focus on her political positions, plans, or other substantive information, and many people considered her family’s choices a political embarrassment, a symbol of the backwardness of Guatemalan politics.

Despite the fact that participation in elections has been growing steadily since the 1996 accords, voter turnout and participation in political groups and activities is still low, due largely to fear of violence (Abom 2004). At least 36 candidates, campaign activists, or their family members were murdered during the 2011 election season, and election observers reported widespread intimidation, vote buying, and even the burning of ballots or electoral boxes (Freedom House 2012). Although turnout was higher than usual in 2011, most people attributed the sudden interest to these vote buying schemes, as well as to the emerging practice of trucking people from one district to another, shifting the territorial strengths of party politics. Finally, both leading presidential parties (Perez Molina’s Partida Patriota and Baldizón’s Lider) hugely outspent campaign finance limits with no consequences. Beyond these issues, the profusion of political parties is astounding, with 14 parties or allied party
blocs (made up of two or three parties each) and ten presidential candidates on the ticket in 2011. In response to these issues, I heard several Guatemalans express doubts that democracy would ever function in their country. One surprised me by declaring, quite seriously, that what the country needed was a benevolent dictator – maybe just for 10 or 20 years – to put things in order. Another wondered sadly if there was something inherently wrong with their “national character,” sighing, “democracy will never work for us. Not here, not for us.” Resignation, defeat, and a broad sense of powerlessness prevailed.

**Electoral overturn and the role of NGOs**

Beyond this sheer resignation in the face of non-transparent, elitist, and corrupt political processes, the actual transition between national governments is “always catastrophic,” Julian told me. He continued by saying that, compared to many, Alvaro Colóm’s 2008-2011 government hadn't really been that bad, despite outbreaks of narco activity (such as the Los Cocos massacre) that he referred to as *almost* a coup d’etat. Still, compared to other former presidents, like Alfonso Portillo, accused of embezzling millions of dollars during his 2000-2004 tenure, Colóm was perfectly acceptable. So while there was nothing inherently wrong with the current government, or perhaps even with the new one to come, Daniel clarified that the real problem was with continuity: by the time one government starts getting its programs in place, it's time for another election. Because of "Guatemala's rhythm" of electing the previous second place candidate, each new president generally begins their term
by undoing everything their former competitor started.\textsuperscript{18} It's like starting from scratch every four years; nothing ever changes, nothing gets done.

As a result, one role that the NGO sector has stepped into in the MBR — illuminated by the elections — is that of a stabilizing force against the unpredictability and drastic changes characteristic of these transitions. The idea that NGOs should provide long-term stability against the vagaries of the state might be unexpected given the fact that the number and identity of NGOs working in the reserve have shifted drastically over time. Many organizations have come and gone, some leaving behind Guatemalan offshoots with various degrees of independence and capacity, or others simply pulling funding altogether with little warning or explanation. Still, the total upheaval that follows national elections every four years is predictable — in timing, if not in effect — and non-state institutions put enormous amounts of time, energy, and thought into managing the transition of early 2012.

The director of WCS-Guatemala, Roan Balas McNab, suggested that one solution would be to have donors structure multi-year funding cycles for NGOs, and to specifically have them span election periods rather than coinciding with them. This latter, he added, would be a “real recipe for catastrophe and disaster.” For an international NGO with a mandate to strengthen local governance and capacity in state institutions, these turnovers can cause deep reflection on the roles of international organizations, Guatemalan civil society, and the state. Roan told me:

\textsuperscript{18} It is important to note, however, that despite the dismantling of particular programs, the presidential office has been dominated by right wing candidates with strong neoliberal platforms, with only a partial exception in the more centrist party of Colóm.
It brings up an interesting issue that's kind of poignant, because, you know, on the one hand our stated mission is to build local capacity, with local NGOs, and especially install capacity in the local government. But then there's this massive turnover every four years where you're almost back to zero and you have to start all over again… and we have this stated goal of building local capacity, supporting local government, when in fact in many occasions, the civil society programs end up providing some of the stability over time. And continuity. And I think one possible solution, you know, wearing my international NGO hat, is to build capacity in the national civil society institutions. Like Balam, and others… ACOFOP, Calas, those sorts of organizations [all Guatemalan]. And that helps somewhat, but you know, it's an ironic situation.

Like many others, Roan emphasized the role of civil society, both Guatemalan and foreign-based, in providing a counterbalance of stability against the total rearranging of state structures and power every four years.

This stabilizing role for NGO institutions complicates critiques of neoliberal governance being shifted onto non-state institutions. These critiques often focus on questions of accountability and transparency as the appropriate measures of democracy, thereby re-inscribing several discourses that form the heart of neoliberal politics, particularly in their definitions of democracy and good governance. NGOs may not be accountable in the sense outlined by electoral democratic politics, but in Guatemala neither is the state. While complexly intertwined institutional practices
blur state/non-state boundaries throughout the Maya Biosphere Reserve, the periodic interruptions of national elections illuminate, enact, and redefine the roles of these different sectors in sometimes surprising ways. These boundaries solidify during government transitions, as people sharing daily work responsibilities in the same office and for the same projects will suddenly find themselves in very different positions based on where their salary comes from – state jobs are most threatened at the same moment that NGOs are working to ensure continuity.

**Strategizing for stability**

Creating active strategies for NGO-led stability through the 2012 government transition took many forms, including building alliances (formal and informal) between NGOs or between NGOs and state institutions (e.g. WCS renewed their legal agreement with CONAP to co-administer CEMEC), sussing out people's political party affiliations to find potential future allies, and most of all, the carefully planned timing of meetings, projects, publications, and other activities. In both DOI and DFID project meetings in 2011, the upcoming government transition would be discussed over and over again as the groups moved through different aspects of their planning, each item requiring its own discussion and tactics. For example, one DOI sub-project involved a capacity-building training with CONAP field staff, and the group had to decide whether or not to wait until after the transition. Acting quickly could strengthen NGO alliances with the low-level technicians who might make the transition smoother in terms of field practice in the reserve, but this had to be balanced against the possibility that the ripples of political change would reach that
far down the institutional structure, in which case the training would have to be repeated for an entirely new group after only a few months.

In both the DOI and DFID projects, management of CEMEC’s information about the reserve — both classic ecological measures and new gobernabilidad indicators — took a central role in inter-institutional transition strategizing. As a full draft of the State of the Maya Biosphere Reserve started to take shape in fall 2011, intense discussions arose about how, when, and where to publicize the collected data. Although much of this information was immediately made available through the project's website (estadodelarbm.org), publicly launching the report through formal presentations, press releases, and targeted distribution of the complete document was subject to careful temporal-political calculation. Those involved tried to predict moments that might serve as effective political pressure points — should they get integrate information into debate questions, hoping to elicit on-camera campaign promises? Wait until post-election, but pre-transition, to build alliances with incoming politicians? Wait until the full effects of the transition had shaken down through the bureaucracies, so they could know exactly who they'd be dealing with at all levels?

Each moment offered its own possibilities and risks, but overall, everyone agreed on two central strategies. First, that a relatively successful government transition would require strengthening as many links and alliances between non-governmental institutions possible before the change took place, and that CEMEC’s monitoring information could create common understandings of major challenges to
help build these alliances. Second, whether or not they released any specific data pre-transition, that they should actively publicize the fact that monitoring was ongoing and that funding was already set aside to hold public forums releasing new information in the coming year — that the NGOs (via CEMEC) were not only watching the transition carefully, but ready to report what they saw.

A term often associated with this strategizing was “political will” (voluntad política); lack of which was a common catchall explanation for failure of positive change in Guatemala. Political will was thus something vague but widely desired, and discussions about monitoring data centered on how the proper use of information might create, encourage, or coerce this slippery quality — often through a balance of carrot (reconocimiento, recognition/positive publicity) and stick (palo, negative publicity or legal action) strategies. In both cases, the idea was that “objective data,” especially CEMEC's new gobernabilidad indicators, should be used to demonstrate political will (or lack thereof) in ways that strategically advanced the political alliances most useful to conservation goals in the reserve. These strategy conversations showed a heightened awareness that information, even when “objective,” could have very different effects in different contexts, an awareness that shifted responsibility for outcomes from those with actual political power to those attempting to use data to influence them. In one discussion of when to release monitoring data during the government transition, a visiting donor told local NGO staff: “you will really be responsible for the future state of the Petén” — not, notably, the incoming government.
Quantifying Gobernabilidad

If these reports and monitoring data were considered such powerful tools in advocating for the reserve on the national political scene, what exactly did they contain? And how, when they were presented to political actors, was the information framed? I followed many pieces of DFID's *State of the Maya Biosphere Reserve* report in great detail, tagging along on an aerial cattle-counting flight, attending multiple formal presentations of the report to different audiences, and even doing the bulk of the translation from Spanish to English for the bilingual website set up to showcase the effort.

The *State of the Maya Biosphere Reserve* provides information about the reserve under the heading of four major categories: — gobernabilidad, 19 ecological integrity, livelihoods, and financial sustainability — and suggests key strategies for future action. The report contained 48 separate indicators, which within the gobernabilidad theme included some that measure what I refer to as governability (illegal cattle populations, reported environmental crimes, land grabs) and others that measure governance (paths of monitoring flights or park guard patrols, locations and staffing statistics of control posts, conviction rates for reported crimes). Many of the gobernabilidad indicators were being conceived, developed, and transformed during my fieldwork in 2011, as attempts to complete a first draft of the report came

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19 On the website, I translated the title of this theme to "governance" in English, reflecting the use of "governance" in English-language project documents from DFID. However, in translating the text describing the theme and various measures included within it, I used both "governance" and "governability" depending on context.
together. A new CEMEC technician was hired with DFID funds at the beginning of 2011 to take responsibility for this project, and he and Victor Hugo frequently negotiated back and forth between the ideal data and presentation that the director envisioned for the report and the realities of what was possible within the time, budgetary, and logistical constraints.

Some indicators were much harder to measure than others. For example, a new form was distributed to field technicians in 2011, asking them to self-report a variety of details of each patrol they walked in the reserve: their objectives, who patrolled and what institutions they work for, illegal activity detected (including a checklist of options such as archaeological looting, hunting, or illegal logging), and other notes. Each form was customized to a particular field location and contained a small map on which patrollers were supposed to trace their route, with space below to include GPS coordinates of key points or findings. The forms came back filled out in very different ways — with more or less detail, either GPS coordinates or map sketches but not both, or sometimes replacing visual and technical locations entirely with a narrative description of the patrol route. Those that did use the map did so in a myriad of ways: tracing a full route with a solid line, drawing a series of points or arrows, or circling one location on the map. Although this system was an attempt to standardize knowledge and reporting of all patrols in the reserve, the resulting reporting practices were highly variable, and some control posts simply failed to hand in their forms altogether. Still, the project director told me, the system was “1000
times better” than what had existed before — no formal reporting procedures whatsoever.

As this patrol data was prepared for inclusion in the *State of the Maya Biosphere Reserve*, a clear emphasis emerged on simple presence and frequency of patrolling rather than any attempt to measure the efficacy of these patrols for finding, reporting, or deterring illegal activity. The careful design of this indicator to shape understandings of the state played out not only in the new types of monitoring and reporting undertaken, but also in the hours and hours of technician labor dedicated to perfecting the presentation of resulting data. One technician spent two full days of work trying to make a PowerPoint animation of mapped patrol routes come out just right — making the patrols change color to indicate the number of times each was walked — before giving up and settling for an imperfect version (figure 2.2). This eye towards presentation also came at the expense of detail. When the handwritten patrol forms were brought into CEMEC, the routes were traced onto a digital map by eye, including any small wiggles or detours along the route. But later, the lines were
“cleaned up,” straightened out to be neater at the zoomed-out reserve-wide scale at which they would be viewed in presentations – a scale at which, I was told, the details don't matter too much.

While more detail is not necessarily better (especially given the variation in reporting that led to that detail), this “clean up” is a strong indicator of the priorities of meaning, scale, and intended purpose for this information. Rather than its potential use to check the details of any particular patrol, or to develop field accountability – which the many non-mapped aspects of the field reporting forms seem designed for – this preparation emphasized simple institutional presence on the landscape at an aggregate reserve-wide scale for presentations and reports to donors and politicians.

In fact, most of the gobernabilidad indicators that might fall on the side of "governance" were constructed to emphasize state presence on the landscape, presented together as "territorial control." CEMEC even produced a map of the flight paths of its own aerial monitoring flights as a new indicator of gobernabilidad and institutional presence.

Representing the State to Itself

In November 2011, the State of the Maya Biosphere Reserve was formally launched with a presentation given to the outgoing president, Alvaro Colóm, in the ornate National Palace of Culture in Guatemala City. The presentation was largely a pitch for funding, as Colóm was on the verge of setting his final national budget before leaving office, and Mariela Lopez, now Executive Secretary of CONAP, followed a precise script prepared by CEMEC to accompany their meticulous
PowerPoint. Institutional presence and gobernabilidad featured prominently in the presentation, which included six slides of maps, graphs, and images outlining key threats to the reserve (or governability, figures 2.3 and 2.4), and ten slides emphasizing state presence and territorial control (governance, figures 2.2, 2.5 and 2.6).
Figure 2.4 Slide of "Multiple Threats" from the *State of the Maya Biosphere Reserve* presentation at the National Palace of Culture (CEMEC 2011). The threats are identified as illegal hunting, archaeological looting, land use change, powerful interests, illegal cattle ranching, illegal logging, forest fires, and monocropping.
Figure 2.5 Slide of "Institutional Presence" from the State of the Maya Biosphere Reserve presentation in the National Palace of Culture (CEMEC 2011). The slide shows the location and staffing institutions of all control posts in the reserve; green is army, orange CONAP, blue DIPRONA (the environmental branch of the national police force), and yellow "other."
Figure 2.6 "Territorial Control" slide, showing CEMEC’s 2011 aerial monitoring flight paths, from State of the Maya Biosphere Reserve presentation in the National Palace of Culture (CEMEC 2011). The caption reads: "Between 2009 and 2011, 46,700km of flight paths, enough to fly around the entire world once." This slide was animated in the presentation, with each flight path traced individually to create a feeling of watching all the flights take place in high speed.
The gobernabilidad section of the presentation ended on a slide showing headlines from the past year, displaying negative news stories alongside positive ones (figure 2.7). As this slide was shown, Lopez said:

The mitigation of these threats will only be possible by increasing gobernabilidad in the MBR. Recently, it was possible to balance the bad news with the good due to increases in gobernabilidad. Nevertheless, it is clear that these achievements are fragile, and their sustainability depends on maintaining
or increasing levels of human and material effort over the short and medium term. [Emphasis added].

After a series of maps, graphs, and numerical measures of both problems and state presence, gobernabilidad was here evaluated not as “good” or “bad” — like familiar "good governance" discourses in English — but rather as something quantifiable, in which increases or decreases (easily supported by more funding from the state) are the measures of success.

This quantification is one of those moments that looks most like “rendering technical” (Li 2007), or removing questions of responsibility, efficacy, or justice from the presence of institutions on the landscape. Numerical measures do create a narrow understanding of, and clear solution to, gobernabilidad issues, but this move to the technical is incomplete, haunted by the invisible but well known factors crowded just beneath the surface of the carefully-plotted maps. The difference here from typical critiques of the technical/political divide (Ferguson 1990; Brosius 1999; Li 2007; and others) is based on the heightened awareness of both CEMEC technicians and politicians of the things that do not appear in the presentation: the removal of politics from gobernabilidad indicators is deliberate, recognized, and oriented always towards the potential danger of knowing or revealing the wrong thing. For example, this presentation included references to “well-funded” land grabs, and identified a key threat to the reserve as “powerful interests,” both thinly veiled references to narcotraffickers and other organized crime. These threats were illustrated with a
single photograph of a crashed plane, rather than a comprehensive map of associated activities (upper right in figure 2.4).

*The Law of the Jungle*

I will return to these careful silences and omissions after analyzing one other aspect of how gobernabilidad is constructed in these maps and reports, in particular the way that its indicators are spatialized along with the presence of forest cover (figure 2.8). Deforestation rates are highest in the west, where drug and human traffic cross to Mexico, where the lag was greatest between National Parks declared on paper and institutional presence on the ground, and where the Green Battalion army forces now roam, putting the “protect” back in protected area. These are the areas that make national news headlines, and which I was warned repeatedly not to visit as a *gringa* anthropologist. It is these western parks that people imagine when they talk about gobernabilidad. In the context of the Maya Biosphere Reserve, gobernabilidad is innately tied to threats to the forest, so in areas where there are few signs of deforestation, concerns over state presence and gobernabilidad disappear, allowing crime and violence to hide among the trees.

This manifested in a variety of ways. CEMEC's tallies of reported and prosecuted crimes in the reserve include only those related to protected area law or involving threats or harm to conservation actors, but exclude other crimes that may have been reported in the reserve. During a meeting of the DOI project, participants ran through various known criminals or problems that they might use the emerging Environmental Justice Forum to address. The subject of two well-known gangs
operating in San Benito was raised, but ultimately put aside because their activities were not related to conservation, thus the group decided that it was “not their place” to report. Tikal National Park, one of the few places in the world certified as a UNESCO World Heritage Site for both ecological and cultural significance, was rumored locally to be a hotbed of corruption. But its forest was well protected, its management a tightly sealed black box (kept separate from other parts of CONAP, and from my inquiries), and no one ever ventured beyond insinuation and circumstantial reasoning. Finally, repeated issues with violence and crime in the small village of Uaxactún (pronounced wah-shock-TOON) were protected from major state action by the village’s successful forest management.

Uaxactún, a village with a forest concession in the heart of the reserve's multiple use zone, is widely praised for its success in community-led sustainable
forestry & development projects, and for its maintenance of forest cover within the bounds of its concession. When people talk about gobernabilidad in the reserve, they are rarely talking about Uaxactún, and in fact, it is literally a blank spot on several maps of institutional presence, surrounded by a shield of more “threatened” areas around the edges of the reserve (e.g. figure 2.4). But there were many examples of crime and violence in the village while I was there – stolen NGO laptops, slashed tires, and shots fired at a truck carrying cash payments for village laborers, and many others that I’m sure I never heard about. NGO workers fretted over these events, considering whether or not to include them among the rolls of environmental crimes — they were not breaking protected area law, but as nearly every aspect of life and work in the village is tied to conservation, NGOs, or concession management, where to draw the line was never clear. These crimes were in some cases reported to the police weeks later, but more often not at all, reflecting a reluctance on the part of the isolated community to engage with the state's notoriously problematic authorities. Instead, the community prefers to determine responsibility and consequence amongst themselves, turning to local vigilante justice along with many other communities across post-war Guatemala (Godoy 2002; Garcia and Cristina 2004; Handy 2004). Even murders have been dealt with internally in the past, with retaliations passing back and forth between families, or somebody run out of town by a coalition of gun-wielding villagers. This is how the village enacts what one NGO worker described to me as *la ley de la selva*, “the law of the jungle.”
CHAPTER TWO: Mapping Gobernabilidad

When the issue of gobernabilidad in the village is raised, it is likely to be in relation to strictly environmental crimes. One case that occurred in late 2011 was the shooting of a small deer that had wandered into the village, a case that might appear relatively minor compared to gunshots fired at concession staff, but which was treated with much greater formality, reflecting its symbolic connection to the broader constructions of environmental gobernabilidad across the reserve. This case was reported up through multiple official channels, by the Wildlife department of CONAP to Tikal National Park (the accused men worked in Tikal), then by Tikal to the Attorney General's office. But in the end, the men were not prosecuted, and the case was dropped. A member of the park service administration told me that he was disappointed in this lack of follow-up:

It worried me. First because knowing the gobernabilidad that exists out there, this type of thing just increases disorder [desorden], it should have been dealt with. Not that much, because it was a deer [cabrito] which is… it's a deer, and there are more in the forest. But the fact was, for me the fact was that this was a lack of respect for the law. And in a certain way, it was not just the law, but also the fact of killing an animal that way. It might have been for food, but that wasn't the way to go about it, you know? And I hoped, first, that they would investigate it as a Park, directly with the Park. Who it was, how it is possible that people who work for the park are doing this, the impacts of this… because it was people who work for a government institution. And you'd think that they should be well aware [consciente], no? The other thing
that interests me is the information in OMYC [Uaxactún's community concession management organization], that they were informed who it was because it's in their administrative area, and I don't think anything is happening with them. It's a problem for me because it was an opportunity to install some order and discipline in the community, and the opportunity was lost. Easier to say, “ahh, it's a deer, there are thousands in the forest…” No. But it was an opportunity to… to use this as a strategy, and to try to impose some order.

Many things emerge in this quote. Notably, there is great confusion over responsibility for enforcing rules: was this the problem of the park service for whom the speaker worked, as general administrator of the reserve? Tikal National Park, because these men were its employees and should therefore know better? OMYC, within whose administrative area the killing occurred? The Attorney General's office, who could follow up with formal prosecution and legal action? In the end this confusion led to no consequences for the hunters whatsoever.

Another thing that emerges is the framing of the problem in terms of the hunters' awareness, a framing echoed by an NGO staff person's response to this same incident, who told me that the difficult thing was to *concienciar la gente* — raise awareness among the people. Gobernabilidad in Uaxactún is often discussed in these terms, as a question of awareness, knowledge, or values surrounding conservation and the forest. This reaction points to the idea that if villagers had the proper knowledge of and attitude towards local wildlife, then the question of gobernabilidad would
CHAPTER TWO: Mapping Gobernabilidad

become moot; they would refrain from shooting the deer out of respect for the deer, rather than respect for the law. Uaxactún's well-maintained forest cover and variety of strong NGO allies mean that responses to problems in the village focus on local environmental education instead of calling up the presence of the army to enforce regulations, as happens in the West.

*Things left unmapped*

There are many pieces of CEMEC's gobernabilidad indicators that never make it into maps and reports because of known limitations to data collection – patrol forms never handed in, crimes that go unreported, financial data that can not be confirmed, and many others. So for many of the indicators, experiential and contextual knowledge was required to understand, and sometimes even trumped, the official appearance of centralized data. This was sometimes referred to as the difference between “cold” and “hot” data — the latter including detailed contextualization, methodological caveats, and practical limitations. For example, as one DOI project meeting viewed a map of reported crimes in the reserve that showed very few in Laguna del Tigre National Park, everyone agreed that the park *should* have the highest incidence in the reserve, even though that wasn't what the data showed (figure 2.9). Here the difference between common awareness of illegal activity and formal reporting of that activity was key to interpreting the map properly.

More strikingly, not all that is known is mapped. A foreign researcher working on a risk assessment project told me how she had requested maps of major drug trafficking routes through the Western national parks from CEMEC, and was
told that no such maps existed – despite the well-known fact that CEMEC had access to this information. CEMEC's monitoring flights over the reserve regularly spot telltale signs of illegal activity, most notably illegal landing strips cut into the jungles of Sierra del Lacondón and Laguna del Tigre national parks. Indeed, this was the same map that David teased about being beheaded for after the massacre at Los Cocos. CEMEC's director Victor Hugo told me that they didn't make these maps because it wasn't within their jurisdiction as a "technical institution," that they don't get involved with the "dirty work." But their maps of illegal fires, land grabs, crimes, and other gobernabilidad indicators belie this retreat behind a technical/political divide, pointing instead to fear and violent threat as determining what does and does not get mapped.
CHAPTER TWO: Mapping Gobernabilidad

The risks of monitoring and reporting do not simply come from drug gangs and obvious criminals, but from the possibility of dangerously-connected actors within the government and justice system as well. Given rumored associations between major regional political figures and some of the known drug trafficking sites in the reserve, it is always feared that any published or leaked information — even if sent “anonymously” to the press or other authorities — will be traced back to particular individuals or institutions with deadly consequences. While none of these connections are known for certain, in the Maya Biosphere Reserve the most feared threats are those that are not known in advance. And even the country’s judges were suspect: discussing the DOI project's tracking of prosecution rates and particular cases in the reserve, one NGO worker told me:

I think the judges, when they find out that somebody's keeping a tally on them, how effective they've been, what sort of resolutions they've given to cases… that can spark some kind of animosity, or… it remains to be seen. But it's one of those cases where I think you're damned if you do and damned if you don't, so why not go ahead.

Potential threat from within the state itself means that the two sides of gobernabilidad become as confused in practice as in language, with lawbreaking and untrustworthy law enforcement mirrored onto each other in complex and shifting ways.
Whither (Environmental) Justice?

The Guatemalan state has gained notoriety and lost much legitimacy for its ineffectiveness in dealing with violent crimes in particular, which are viewed by many elite politicians as irrelevant to political or economic goals (Howard et al. 2007:720). According to the *State of the Maya Biosphere Reserve*, the prosecution rate for reported environmental crimes in the MBR was around 10% in 2011 (WCS 2011), an incredibly disheartening statistic, especially taking into consideration the exclusion of unreported and non-environmentally linked crimes. Of course, this 10% is often presented as an impressive and laudable figure, compared against the broader context of even lower prosecution rates across the country. As one conservationist reminded me: “What's the successful prosecution rate for human murder, in Guatemala? It's around 4%. So 96% of human murders, total impunity. That's the context in which we're working and trying to promote improved governance of the reserve.” At every stage of response to a particular case, the doubling of threat from within/without the formal justice system can lead to a paranoid paralysis, the location of potential danger unknown.

The new Environmental Justice Forum was envisioned as a way to counteract this paralysis, a major coordinated attempt to change the dynamics of violence, injustice, and impunity, at least in the limited sphere of environmental crimes occurring in the Maya Biosphere Reserve. Several cases were being considered for

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20 The success of Otto Perez Molina's Mano Dura election campaign was a notable exception, and may indicate a shift in the role of crime and violence in Guatemalan party politics.
the launch of the forum, including the murder of a local conservation ally, the “loss” of huge numbers of cadastral records by a government office (linked to illegal sale of lands inside the reserve), and a major case of archaeological looting and trafficking of artifacts in Mexico. Each of these cases carried with them a shadow set of problems — networks of actors, interests, alliances, not all of which were known for sure, but which nonetheless deeply shaped the possibilities for response. In all three cases, serious discussions were held not just about what kind of evidence needed to be gathered, but the most effective strategic use of that evidence. This could not be a matter of simply turning information over to legal authorities, and in many cases meant collecting additional evidence about lack of legal action or follow up by those within the justice system. Similar to the use of monitoring data for political pressure during the elections, the strategizing for handling of particular cases was intense, but even more so given the ever-present possibility of violent retaliation.

Even without a formal administrative structure, the Forum did begin to make headway in late 2011, due largely to the unprecedented initiative of Attorney General Claudia Paz y Paz. Paz has been lauded in the international media for her willingness to prosecute major drug barons and to put a former dictator, Efraín Ríos Montt, on trial in the country for genocide (his conviction, a major accomplishment, was immediately overturned by the Supreme Court on a technicality). Her eagerness to actually pursue the cases presented by conservationists working in the Petén surprised them, and this unprecedented action spurred even more fear and self-protection, not least because there was at least one known corrupt link working within the
environmental prosecutor's office. Some of those who had been involved in the
development of the forum refused to give official statements, others pretended a total
lack of knowledge when they were outside the safety of the Attorney General's
“fortress-like” office, and all quietly worried about danger to their friends, families,
coworkers, and selves. My own inclusion in the planning meetings and discussions
for the Forum was abruptly brought to an end when these cases started to make
headway – I was shut out, most likely for my own protection as well as those who
continued to pursue action. Still, this danger was mediated by a rare shred of hope,
unfamiliar in the Guatemala, that perhaps the Forum would succeed in achieving real
legal repercussions for crimes that were committed under the safe assumption of total
impunity. Of course, Paz's aggressive prosecutions and success have come with a
price – not only has she received numerous death threats, even as I write she is being
forced out of office six months before the end of her constitutional term.

Conclusion: Hard Questions and Hard Data

There is much disagreement among people working in the reserve about how
much should be kept under cover, and how to manage the risks involved in exposing
or attempting to root out drug and other illegal activity. As the risk researcher
requesting drug trafficking maps learned, it can be incredibly difficult just to get some
conservationists to even discuss things like kidnappings or threats, even if these are a
regular part of their work life and experience. My own quiet exclusion from the
Environmental Justice Forum meetings when they got too specific, or drew too close
to dangerous information, mirrors this silence. In another moment, responding to a visitor's question about whether he would call to report landing strips he had seen in a monitoring flight to the governor or director of CONAP, one conservationist said incredulously, “on their phones? They'll find out. If they don't already know.”

At the same time, people worry about the consequences of participating in these silences. One NGO worker told me that if conservationists stick their heads in the sand like an ostrich, they're leaving the rest of themselves exposed to "a good screwing" (una buena cogida). He continued, obviously practiced at avoiding the word "narco":

There's been a lot of discussion, you know, with people from CONAP, and there's a lot of common knowledge about hot spots. It's a question… you know… that one of the challenges that faces conservation, that faces local communities, faces the sustainable future of this whole area, are these questions of really, you know, thorny governance issues. So… it's incumbent on us, as people that are promoting conservation, and that live from conservation, to find a way to grapple with these things, one way or the other.

Figuring out how to respond to these issues — both crime and lack of state response, governability and governance — was always a careful game of balancing accountability and protection from possible retaliation. As regional director of CONAP-Petén, Mariela Lopez garnered praise for her ability to walk this line, a skill credited to her years of experience working in CONAP's legal department. According
to an NGO conservationist, her especial skill lay in “triage” of problems and issues in
the reserve, defining these along an intertwined continuum of importance and danger:

There's *these* set of issues over here [at one end of a scale drawn out in the
air], these are just too intractable. Anybody that tries to open this pandora's
box is just *gone*. And… that means that some yay-sayer is going to come in
and just do the bidding of, potentially, some *other* interests. *This* set of issues
[at the other extreme of the indicated scale], they're not very complicated, we
can address them. *These* [in the middle] are the thorny issues, these are thorny
issues that if we set up the right alliances, if we have the resources, if we get
certain amounts of backing, we can actually make a real, significant difference
here. And that's what she [Mariela Lopez] did, and she focused on that central
set. To her credit.

The intractable contents of pandora's box, the “other” implied in “other interests” and
their assumed power to replace key figures in the government — these are the
shadowy presences of ungovernability, the hidden powers that make rule of law a
strange fantasy in Guatemala.

In this context, the power of apparently apolitical and objective monitoring
data produced by CEMEC was widely respected and desired, even as the data
themselves were haunted by the same dynamics they purported to represent. Many
considered CEMEC's new *gobernabilidad* indicators as essential tools for pressuring
politicians, police, the Attorney General's office, and judges to enforce laws —
formally measuring *gobernabilidad* was seen as key to improving it. Again, this
shifted responsibility for change away from the state and onto CEMEC and the NGOs responsible for creating and managing this hard data. But like Mariela Lopez's triage of problems in the reserve, CEMEC's knowledge creation practices carefully navigate between too much danger and too little impact.

The idea of gobernabilidad is tied to CEMEC through the dream of omnipresent vision and technoscientific neutrality, both promised by remote sensing technologies. At the same time, the unseen and the unknown hold sway. Life and work in Guatemala is dominated by rumor, suspicion, and entirely reasonable paranoia: *Just because a park is patrolled, doesn't mean the guards will report what they find. If an innocent farm laborer is killed, perhaps he wasn't so innocent after all.* CEMEC's indicators of gobernabilidad respond to these doublings and confusions, enacting a landscape on which there is a clear difference between the state and non-state, between legality and illegality, between the moral use of force to protect the environment and illegal violence linked to deforestation. These maps and reports enact a reserve in which gobernabilidad is identifiable, measurable, and straightforwardly improvable. In which priorities and necessary interventions become clear.

Yet still, each of these maps, indicators, and reports is haunted by its silences. A map of reported crimes haunted by the knowledge that reporting is extremely rare and that impunity rates are over 90%. A map of patrols haunted by an utter lack of efficacy or accountability associated with that institutional presence, and the knowledge that the state is just as likely to be involved in crime as preventing it; a
map of successfully protected forest cover haunted by the incoherency of conservation actions, such that the army is sent in to evict poor migrants in one part of the reserve while in another gun violence goes unreported while people spend weeks worrying over the life of a single deer. These silences and hauntings reveal that CEMEC's monitoring are not a simple representations of a coherent, singular landscape, but rather concentrated attempts to enact depoliticized, technoscientific landscapes of possibility and clarity.

But because these enactments always sidestep the most threatening and dangerous possible worlds, the actions they enable on the part of conservation NGOs, CONAP, the Environmental Justice Forum, and others are similarly haunted and contradictory. The equating of state presence with governance, and of deforestation with ungovernability, allow the Guatemalan state an easily improved measure of “success” that pays little attention to the effects of state and non-state action on the ground. In this way, the mapping of gobernabilidad in the Maya Biosphere Reserve will most likely reinforce state and international funding for military and police presence while undermining flexible responses to the complex, shifting problems that characterize the broad landscape of the reserve. Attempting to enact alternative landscapes of justice, accountability, or responsibility, even if these are desired, may simply be too dangerous. Those developing strategies for conservation and gobernabilidad in the reserve are trapped between the desire for clarity and its impossibility, and wending their middle path between violence and inefficacy, they end up resigned to their own participation in the same dynamics. As one NGO worker
told me, despite the fact that it's “uncomfortable” to confront organized crime, to deal with extreme violence, to work with the army despite its genocidal history, this is the future of conservation in the region.
CHAPTER THREE
A Reserve Full of Rooftops

December 2011: Pointing to a purple dot marked on an aerial photograph of the small forest village of Uaxactún, my friend Josue exclaimed excitedly, “that house just isn’t there anymore, that’s where Carlos used to live!” I sat with him and another local man, Marvin, in the sweltering mid-afternoon shade, where my maps, photographs, and questions provided them a welcome break from their usual labor maintaining WCS’s local installations. Together we were examining the photograph of the village, located inside the Maya Biosphere Reserve’s Multiple Use Zone, used by CEMEC in its annual estimation of population levels inside the vast reserve. Poring over the details of the photograph, with tiny rooftops coded as red, blue, or purple dots depending on how long they had been present, the two men oriented the photograph along the long, abandoned pista (landing strip) that ran down the center of the village, and eagerly worked together to fill in the human stories behind the
appearance or disappearance of particular rooftops in the photograph – who had moved in or out, when, and why. They delighted in locating their own houses, as well as those of their extended families and friends. Other parts of the image, they told me, were simply wrong, including the location of a small pond, which Marvin insisted was in a different place. As we discussed the use of this photograph to measure the village’s population, both men agreed that CEMEC’s methodology was deeply flawed, saying, “what CONAP is missing here is to bring this [image/report] here to the community, so that they are using more complete information.”

**November 2011:** Three weeks earlier, far away in the ornate National Palace of Culture in the capital, Guatemala City, I had watched as a PowerPoint slide with a similar aerial photograph, this time of the village Paso Caballos, flashed on screen (figure 2.3, in the previous chapter). The slide was animated to show population growth between 2006 and 2009 in this Q’eqchi’ Mayan migrant community, located inside Laguna del Tigre National Park. Part of the formal presentation of the *State of the Maya Biosphere Reserve* report to the president of Guatemala, Alvaro Colóm, the image was followed by a graph projecting population growth across the whole reserve over the next decade, and served to illustrate that population was one of the key threats to the reserve, alongside climate change, forest fires, and the delicately unnamed “powerful interests.” The presentation carefully balanced congratulations for the president on his previous support for protected areas with images like this one, designed to convince him of the urgent need for one last funding boost, as Colóm was on the verge of deciding his last national budget before leaving office.
February 2012: Months later, attempting to replicate my successful image-laden interviews in Uaxactún, I wandered the dusty, trash-littered paths of Paso Caballos with printed aerial photographs and maps in hand, but the majority of villagers I encountered were either unwilling or unable to speak to me. Sometimes this was due to a language barrier – many women and older men speak only Q’eqchi’ Mayan, not Spanish – or to fear that I was a dangerous gringa there to robar niños, stealing their children away for the black market organ trade. Other times, this reluctance was most likely due to an experience-informed distrust of outsiders, especially those coming in asking questions about how many people live in the village. Even those who happily discussed many aspects of life and work in the community could not or would not answer about questions about the village’s population, other than to briefly insist that the rapid proliferation of rooftops shown in CEMEC’s images reflected only the growth of current resident families (which often have eight or even ten children), and that no newcomers were moving into the village. Immigration such as this would break the rules of Paso Caballos’ tentative, semi-legal agreement with CONAP that allows them to live inside a National Park. One or two men admitted that there were people who had moved in that CONAP didn’t like, but these people were family, they insisted, and therefore should not really count as outsiders.

These three vignettes, and the two villages featured as photographs within them, frame my argument about the ontological politics of population in the Maya
Biosphere Reserve. Aerial counting of rooftops enables a reserve-wide view of population, which helps create and maintain a coherent narrative around landscape change and sustainable development needs across the reserve, useful at higher political levels such as the scene in the National Palace. In this way, remote monitoring of human settlements in the reserve enacts both a population object and a scale and politics within which that object is particularly meaningful. On the other hand, in terms of village-level decision-making and priority setting, this information is often inaccurate, and can directly conflict with other enactments of population, particularly those emerging out of these villages themselves. CEMEC’s official, technical estimates are often given greater weight than local understandings of village settlement and population dynamics, however, because of the perceived objectivity and neutrality of photographic methodology – hard adjectives to come by in a landscape beset by violence, social and political conflict, and rapid change.

But this trust in technological truthfulness is a political, not a technical, determination, and one with political consequences. There are two closely related problems that arise in the way that CEMEC’s population numbers are used and interpreted in conservation practice in the Maya Biosphere Reserve. First, the enactment of a “population problem” in the reserve flattens differences in history, ethnicity, land tenure status, demography, and poverty – both between and within villages – that play much greater roles in human environmental impact than the sheer number of people (Harvey 1974). Second, when official, remote population estimates are at odds with local enactments of human settlement and reproductive dynamics, it
is left up to individual state and NGO practitioners to make sense of the conflicting information, creating a rough patchwork of interpretations and decisions that reflect individual political preferences and social ties.

The idea of enactment draws attention to the ways that multiple ontologies of population arise through different practices, such as aerial monitoring or on-the-ground census (Law and Mol 2008; Mol 2002). My analysis of population monitoring therefore contrasts with those that might frame the question as that of multiple perspectives or approaches to a single ‘real’ object, and also shifts the focus from questions of agency or intentionality to insist that enacted objects like population are always also actors (Law and Mol 2008). This builds on the usual question: who made this population estimate, and why? In addition, this chapter also asks, what do population numbers do?

And population can do a lot – in the Maya Biosphere Reserve, it can incite fearful discourses of loss, draw state resources for health and education services, change forest protection policy and practice, reinforce ethnic identity and politics, and challenge definitions of belonging or rights to land. The first version of population that I will examine will be the one used across the reserve, enacted by remote aerial counting of rooftops by CEMEC. Following this, I will “zoom in” to the two villages of Paso Caballos and Uaxactún to look at the political and ecological factors elided by this remote monitoring enactment, and to examine alternate enactments of population, or, in the case of Paso Caballos, an enactment of human growth and settlement dynamics that doesn’t ever settle into a coherent ‘population’. Finally, I will analyze
the ways in which these different enactments, with their very different commitments and politics, come together (or not) in practice.

Population in the Petén

The creation, measurement, and management of the object known as population have long been tied to debates about modern governance, development, and the environment. Population, as a quantifiable and statistically defined view of humanity, provided the basis for the rise of modern nation-states and governmentality throughout the 19th and 20th centuries (Foucault 1991). The origins of international development discourse have also been linked to population, beginning with 19th century debates over Malthusian population-environment models, in which a predicted resource conflict led to an ideology of directed (as opposed to naturally-occurring) progress (Cowen and Shenton 1995). Malthus’ models were developed with an explicit ideological defense of capitalism and private property, but these connections have often been submerged and ignored in more recent versions of population science, where social-historically determined terms such as “resources,” "technology," “scarcity,” or “subsistence” are seen as natural, objectively-defined entities (Harvey 1974; Boserup 1976). As such, the idea that growing population poses a threat to natural landscapes has become one of the world’s most pervasive “environmental orthodoxies,” a powerful standardized narrative that is based more on political ideology than understanding of ecological landscapes (Forsyth 2002).
Beyond its circulation in global discourses, population in the Maya Biosphere Reserve in particular carries the historical weight of the Petén as a frontier region in the late 20th century. The tremendous population growth in the region since the late 1960s – from less than 30,000 to more than 750,000 people – was caused by a confluence of factors that continue to shape the landscape today (Schwartz 1990; Nations 2006; Primack et al. 1998). The first of these factors was a state-led program to colonize the region, known as the National Enterprise for the Promotion and Economic Development of the Petén (FYDEP). In the late 1960s, in order to relieve political pressure caused by the country’s vast land inequality without addressing the roots of that inequality, the US-backed military government began a program of road building and colonization into the Petén’s lowland forests. The financial successes of this campaign flowed to the oligarchy and military generals via lumber, cattle, oil, and mining development, while political rhetoric was focused on opening the Petén as an outlet for poor, landless peasants (Berger 1992; Colchester 1993).

By the late 1970s, the Guatemalan state was encouraging colonization on a massive scale, with over US $5.6 million donated by USAID to support rural resettlement programs (Wittman and Tanaka 2006). Despite U.S. support, these colonization projects were under-planned, underfunded, and beset with huge infrastructural problems: not enough and substandard housing, no health facilities, poor soils and tough-to-clear jungles, and isolation from national markets. The Petén was being used as a release valve for social and land pressure in other areas of the nation, but its continued isolation and agricultural undesirability quickly marked it as
a place left to the most desperate of the landless poor. As migrants flooded the region in excess of the state’s ability to manage them, the government quickly turned its own rhetoric on its head and declared them land invaders (Berger 1992:131).

Layered over this rural development program was the violence of the 36-year civil war. During the 1970s and early 1980s, the jungles of the Petén provided a relatively safe path of flight for hundreds of thousands of internally displaced people (largely indigenous Maya) whose highland villages were violently razed in scorched earth campaigns. But where people fled, the violence followed, and the Petén was one of the areas with the highest military massacre rates in the early 1980s (Egan 1999). Many people that had originally moved to the region in the colonization program soon fled across the border into Mexico, returning in the 1990s to a landscape newly overlaid with conservation concerns (Egan 1999). People displaced by violence competed for land with those pulled by the promises of colonization programs, and this competition has continued into the present over the attention and resources of conservation and development NGOs (Carr 2006; Egan 1999; Bailliet 2000). Returned refugees from Mexico who settled in the Petén have received much greater attention and support from NGOs, often due to access to education and organization in Mexico (Carr 2006). Those who stayed behind in Guatemala, whether displaced persons or agricultural migrants (and the lines between these are rarely clear), were almost certainly witness to, if not victims of, state violence, and the channeling of development funding to those people who fled can lead to serious resentment and conflict between communities.
Both the push of military violence and the pull of available land in the Petén intersected in complex ways with the ethnic divisions in Guatemala. Civil war violence was heavily targeted at indigenous groups, and approximately 20% of migrants to the Petén identify as Q’eqchi’ Maya (the majority as Ladino). From their beginnings, political debates surrounding state colonization programs focused heavily on racial and ethnic divisions among migrants. In 1967, the head of FYDEP, Oliviero Casasola, stated that what the Petén needed was Ladino businessmen, not Indian peasants: “No matter how much sympathy we have for the Indian problem, it is not this human contingent which the Petén process needs” (quoted in Berger 1992:148). Today, these divisions continue to play into conservation discourses and practices in a wide variety of ways. For example, Q’eqchi’ are sometimes assumed to be more harmful to Petén landscapes than Ladino migrants due to their mis-placed indigeneity, based on the idea that their indigenous farming systems are naturally adapted to different environments (e.g. Nations 2001; Nations 2006).

Migration and colonization waxed and waned over the years, but the push of military violence and the pull of available land combined to produce an immense population boom in the lowlands. This spectacular growth, unsurprisingly, resulted in the loss of more than half of the Petén’s lowland tropical forests, an impact that led to international conservation attention and the establishment of the Maya Biosphere Reserve in 1990 (Meyerson 1998). With this historical trajectory, it is unsurprising that the question of population remains incredibly important to both state and NGO agencies working in conservation and development in the Petén. Still, as the rest of
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this chapter explores, the ways in which this population object is enacted, measured, and managed have enormous political and ecological consequences.

A Reserve Full of Rooftops

Remote population monitoring is conducted on all settlements located in the nuclear and multiple use zones of the Maya Biosphere Reserve each year, barring budgetary, logistical, or climatic problems (for example, there is no 2012 population estimate for Uaxactún due to recurring cloudiness on scheduled flight days). CEMEC sends technicians (and occasionally, visiting anthropologists) on low-altitude flights to snap photos of the reserve in the dry months from late January through May, rigging a computer-linked digital camera to the side of the plane. This set-up, performed without specialized aerial photography equipment, requires an extraordinary amount of complex know-how, using plenty of tape, chunks of foam padding, zip ties, and stretches of cut up inner tube to secure the apparatus, ensure the proper zoom and angle, and counteract the small plane’s heavy vibration. A volunteer pilot – usually a retiree from the US, working with the non-profit flight organization Lighthawk – then sets out to follow the flight path planned by CEMEC, flying just high enough over settlements to snap single images that capture all the rooftops.

Aerial photography is used for several different monitoring projects in CEMEC, all of which require a careful location of photographs in space and time in order to compare them with previous years’ images. This process, called georeferencing, takes place back in CEMEC’s computer lab by matching the time
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stamp of each photograph against the flight’s GPS tracker for an initial location, then matching points of comparison (graphically distinct features) with previous years’ photos, so that each image is stretched precisely across a grid of latitude and longitude.21 Precise georeferencing is essential for CEMEC's rooftop counts, as individual houses need to be identified and recognized in photographs from multiple years. Once georeferenced, a technician carefully overlays the image with data from previous years, then manually marks each rooftop with a distinct color to indicate whether it was previously present, a new construction, or a new absence of a previously recorded building. The total number of rooftops in each settlement is then multiplied by 5.5 – the average number of people per family determined from a 2001 census of the reserve (Ramos et al. 2001) – in order to estimate the population of each village, and of the reserve as a whole.

The assumptions embedded in this methodology are: 1) that each rooftop is a “household;” 2) that all households hold to the 2001 reserve-wide average of 5.5 people per family; and 3) that the number of rooftops in a particular place has a linear relationship with population growth that follows this average. My examination of Uaxactún and Paso Caballos will show how these assumptions don’t hold well in particular places, but there are also several issues at a general level: 1) the original census measured people per “family,” which does not necessarily map onto number

21 Georeferencing is also widely recognized among CEMEC technicians as their most time consuming and tedious task, with the staff almost entirely consumed by the activity of searching for recognizable points for months during and after the monitoring flight season. During these months, even the office's receptionist is recruited to the dull work of photo matching.
of rooftops seen from above; 2) different communities had different per-family averages in 2001; Paso Caballos was slightly over 5.5, while Uaxactún was under 4.8; and 3) new rooftops do not necessarily appear linearly with population growth, but according to more complex social and cultural logics – for example, it makes little sense to imagine a household splitting in two when it reaches a critical mass of 11 people, but a new house would likely be constructed by a young couple moving out of their parents’ houses and starting a family.

Still, when averaged over the vast expanse of reserve as a whole, annual counting of rooftops gives a very good general indication of whether settlements are growing, shrinking, or staying stable, and at what pace, as well as a broad view of how human populations are distributed across the reserve. It also provides a relatively quick, cheap, and easy estimation of population, something which would be extraordinarily difficult to do otherwise with such scattered, remote villages, and with the complex dynamics of immigration and reproductive rates that vary highly between villages. Even beyond this pragmatic reasoning, on-the-ground census counts are notorious in Guatemala for poor coverage of remote areas, and the Maya Biosphere Reserve's social and political conflicts that can erupt into violence make census counts of illegal settlements particularly difficult. The 2001 census of the reserve, directed and published by CEMEC, had to be carried out by malaria public health promoters, who were able to enter and gain the basic trust of small communities that would otherwise turn away people too easily recognized as agents of the state (see box on following page).
In 2001, CEMEC published a census of the reserve that contained information about demographics, access to basic services (water, health, education, etc), agricultural production, and other economic activities in the majority of communities inside reserve boundaries (Ramos et al. 2001). The census also included the heavily populated "buffer zone" along the southern edge of the reserve that is not counted in current aerial population estimates. Funded by USAID, CARE (an international development NGO), and Austrian Development Cooperation, the census was considered an enormous success, especially in comparison to those conducted by the national government. In an interview, one CEMEC technician told me he considered the census the most impressive achievement of their office to date:

"The work was very good, because... because the government doesn't... the census of the government isn't so good. Here in Guatemala they don't visit all the houses, and the information is really limited. In contrast, here we asked two pages of questions, lots of information. This was the most important accomplishment up to the present moment."

Despite being conducted by CONAP, the extraordinary amount of census information was not collected in the villages by CONAP personnel, but rather by extension workers for the National Service for the Eradication of Malaria (SNEM). It was well known that many villages would be unwilling to give information to CONAP, which was perceived as an antagonist over land rights and access inside the reserve, so CONAP contracted workers who were familiar to and trusted by villagers to carry out the extensive, two-page questionnaires from house to house.

Even this strategy eventually met with some resistance: a few SNEM workers, particularly indigenous extension workers conducting surveys in indigenous villages, let it be known that the information they were collecting was in fact for CONAP, after which people in these villages began to "hacer bulla" (make a commotion). This reluctance to give CONAP information, in addition to the cost and logistical issues involved in carrying out an on-the-ground census, was a major factor in CEMEC's turning to the indirect population estimation method of aerial photography. As a result, of course, detailed demographic data such as age structure or ethnic identity, as well as information on livelihoods and various markers of "development", are no longer available for yearly comparison and analysis.

Enacting the Reserve Population

The outcome of each year’s population monitoring is a simple report, detailing the process with a sample photograph (in 2012, the example was again Paso
And including mapped images to indicate the percentage population growth of each community and their total estimated population (figures 3.1 and 3.2, respectively). Finally, the report includes a table of raw estimated population data and house counts for years in which the monitoring was carried out (beginning in 2006), along with a few comments on noted trends, important communities, and any missing data. This report circulates out from CEMEC through many state agencies and NGOs working in the reserve. The reserve-wide maps and summaries are often used in presentations, websites, and other reports, while population estimates for particular settlements are sometimes carried out to the villages by conservation and development practitioners, including WCS’s field staff assigned to work in Uaxactún and Paso Caballos.
The images, maps, and table in this report create a coherent, broad-view story of human population and its growth across time and space, easily digested and moved between contexts, and key to attracting support and funding from higher political levels. This information is incredibly useful in requesting support for both development projects – health and education projects for growing villages – and for conservation initiatives that may conflict directly with the above – more guards, control posts, or even discussions of forced evictions of groups of people (from the Western National Parks of the reserve in particular). When shown in the National Palace to President Colóm, this population data integrated seamlessly with a broader

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22 This particular conflict – whether to provide services for people, or whether those services would be seen as encouraging further illegal immigration to the parks – is a major dilemma for many conservationists in the reserve. This conflict is covered further in the next chapter.
message about the importance of proper funding and management of state protected areas.

Aerial monitoring enacts not only a single, undifferentiated population object, but also a neatly bounded “reserve” in which that population can be found and a coherent state assumed to manage both territory and population (Sheila Jasanoff 2004). Emerging from complex and tedious practices of aerial monitoring, the co-constituted objects of the Maya Biosphere Reserve and its population help create and maintain broad narratives about environmental change and sustainable development, simultaneously producing the need for intervention at departmental, national, and international political levels. And if enacted objects are also always actors (Law and Mol 2008), then a population – a numerical, territorially-bound, governable measure (Foucault 1991) – acts very differently from alternative enactments of local reproduction and migration dynamics, as the examples of Uaxactún and Paso Caballos clearly demonstrate.

**Zooming in: Population and Pageantry in Two Villages**

Uaxactún and Paso Caballos – and the enormous differences between them – provide two lenses through which to diffract aerial population monitoring and its corresponding reserve-wide scale. More than simply providing different local perspectives on population numbers, in each village the enactments of human

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23 By using the term "diffraction," I draw on methodological insights developed by Donna Haraway (1997) and Karen Barad, the latter of whom defines diffraction as "a tool of analysis for attending to and responding to the effects of difference" (2007:72), including ontological difference.
reproductive and migration dynamics form ontologically incommensurable objects. In Uaxactún, villagers comfortably estimate their own population, estimates that are up to 60% smaller than aerial counts and that claim the village’s numbers are shrinking despite the increase in counted rooftops each year. In Paso Caballos, villagers tend to reject the move to quantify inhabitants, turning instead to related concerns about women’s reproductive health and rights, and who does or does not belong within village boundaries. And in both villages, answers to questions about population are formed not as abstract numerical counts, but through complex understandings of land rights, ethnicity, economic and political position, and access to health and education services.

According to CEMEC’s 2012 report, Uaxactún’s population is currently estimated between 1,600 and 1,700 people, and has grown by less than 100 people since counting began in 2006 – although it is important to note that no successful rooftop photograph has been taken of Uaxactún since 2010, making the data slightly out of date (CEMEC 2012). Estimates from village residents and NGO staff who work in the community always claim a much smaller population, usually fewer than 1000 people, and also add that the local population has been slowly shrinking for the past few years. This understanding is in direct contrast to the slow but steady growth of rooftops in the village, but reflects the recent increase in education that has resulted in younger community members leaving to seek work in the central urban area of San Benito, Santa Elena, and Flores. In Paso Caballos, the 2012 population estimate was just over 2000 people, a number that has almost doubled since its measure at 1100 in
2006. In contrast to Uaxactún, those who lived and worked in the community were generally unable or unwilling to comment on the population estimate or provide alternative estimates; questions of who lived in the community were extremely sensitive due to conflict over strict Park rules about immigration.

In order to understand the vast differences between the enactments of population or village growth in these two places, I will explore the complexities of each village’s location, identity, and human dynamics. I use Uaxactún and Paso Caballos to illustrate my argument, emphasizing that these are not examples of two (or more) types of village in the reserve, but representative of the broader incommensurability between many different formations of local village life. There were 56 communities counted in the 2012 population report, ranging in estimated population from 28 to 3724 people (CEMEC 2012). Each of these is unique in terms of its mixture of migrant, Petenero, or returned refugee status; ethnic identities; and access to land rights, regional transportation networks, and health, education, and other services. As an introduction to these two communities, both located at the very end of long unpaved roads, I will use one of the key events through which I myself came to know the contrasts between them – their school pageants.

Two pageants

Who better to stand in for symbols of population growth than children? By strange luck of timing, and by virtue of my privileged position as a white North American researcher, I was asked by both Uaxactún and Paso Caballos to act as judge in their annual pageants, in both cases organized and involving contestants (only
Girls) from the village elementary schools. In Uaxactún, this was for the selection of the Niña de Independencia and Niña de Guatemala (first and second place), chosen as part of annual Independence Day celebrations. In Paso Caballos, the pageant was an ecologically-themed costume contest organized by the school as part of the village’s Carnaval celebration. In both cases, I accepted the invitation and approached the experiences with a cautious curiosity, wary of judging young girls on their appearance and performance. That discomfort never left me, but the contrast that emerged between the two villages’ pageants deeply illuminated the differences between each community’s social and economic worlds.

My invitation to participate as a judge in the Paso Caballos pageant came with little formality from a village teacher. When I arrived, a crowd of costumed and glitter-strewn children, along with a handful of teachers, parents, and curious onlookers, filled the bare-earth yard in front of the rundown school buildings, where the event was to be held on a rickety outdoor wooden stage that doubled as extra classroom space for the overcrowded school on clear days. Four child-sized desk chairs were lined up for us judges in front of the stage, and I was joined by two teachers and one of their boyfriends who had motorcycled into the village for the special occasion. After a ceremonious opening of flag-bearing, anthem-singing, and pledge of allegiance, we judges were provided with printed score sheets, listing six contestants' names, grades, and the categories in which we were to score them: costume, dancing, and presentation and speaking.
When the pageant began, I realized that the names on the score sheet were out of order and missing two contestants altogether, both representing the second classrooms of grades that were so crowded they had been divided in two. I required the repeated aid of the teacher seated next to me to deal with the confusion, and spent as much time simply trying to figure out which contestant was which as I did evaluating and noting their various scores. To make matters more unclear, an additional kindergartner stood onstage, danced, smiled, and waved with the other contestants throughout the contest, though she was not officially a part of the competition.

Carnaval had been altered by the school’s teachers from its traditional pre-lent party to explicitly reflect ecological themes, and the contestant's costumes – some store-bought, some roughly constructed from paper and fabric – reflected this emphasis. Seven of the eight wore costumes representing local wildlife: a blue-headed parrot, a jaguar, a bee, a butterfly, and three scarlet macaws, this last a local icon of conservation due to its endangered status and nesting sites near the village. The eighth contestant was dressed as agriculture, the sole source of income and livelihood for the village. The contest consisted of a brief introduction, a dance round, and short speeches, but most of the girls seemed nervous and unsure of what was expected of them throughout the show: during the dance round, only one girl (the eventual winner) seemed to know the choreography, and during the "speeches" only she and one other contestant said anything beyond their name and classroom.
Despite the disorganization, or perhaps because of it, the event was extremely fun. Between the rounds of the contest, kids from the audience were invited up onto the platform to dance with costumed teachers. After the pageant winner had been chosen, these dances became audience-applause-governed contests with the chance to win wrapped prizes – although the pageant's winner had received nothing but a sash and symbolic victory. No second or third place was awarded; the other girls were simply thanked for their participation and faded back into the crowd of costumed kids. The party that followed, with seemingly endless rounds of dance competitions, lasted longer into the night than I did.

The contrasts with Uaxactún's independence day pageant, a highly formal and serious affair, were striking. I was invited to join Uaxactún's judging panel by two women who solemnly approached me, asking if they might speak to me and ask a favor. I laughed when their serious demeanor resulted in a request to participate in the school's pageant, but soon learned – through the reaction of my NGO staff companion, Julian, to his invitation – that this pageant was serious business indeed: “Oh no, I’m not doing that again!” he cried. “No, it’s different now,” insisted Gloria, one of the two women, “there’s no money involved anymore, it’s just for simpatía [good will].” They explained to me that in past years, the girl who won would receive a cash prize as well as the honor of representing the community at various functions throughout the coming year. Historically, the community had voted on the winner, but each year scandals erupted as families made alliances and bought votes for their daughters, and the pageants were always followed by accusations and community-
dividing fights. Julian had been in charge of vote counting in a previous year, and afterwards half the people in the town turned on him, accusing him of manipulating the result. After some goading from Gloria, he reluctantly agreed to take part in the reformed pageant system: there was no cash prize, and the judging panel would be composed entirely of outsiders (ourselves plus three men from two other NGOs) in an attempt to eliminate bias.

The next evening I found myself seated at a special judge's table at the front of a community meeting hall packed with an audience of all ages, instructed to judge the eight contestants on three criteria: their outfits, artistic technique, and charisma and expression. After the same opening of formal, ceremonial patriotic demonstrations, the contestants then announced and brought one by one to the stage, each in an elaborate two-piece outfit with a headdress designed to represent some aspect of local identity and culture: one girl represented the xate palm, a local non-timber forest product (NTFP) harvested in Uaxactún's concession; two were dressed as fire and maize, representing local agricultural practices; one wore a costume symbolizing “conservation”; and the rest wore outfits related to the Mayan archaeological sites flanking the village or to colonial history and legends from the region.

This costume presentation was followed by two more, one choreographed group dance in which the girls wore their school uniforms, and another in which they emerged in long formal gowns and high heels to give brief speeches about patriotism, local pride, or the future of the community and country – their messages as candidates for Independence Day queen. Each of their movements, down to the one-hand-on-hip
pose they took while quietly waiting through their competitors' speeches, was tightly choreographed and well-practiced. Between acts, the teacher-MC gave surly admonitions to the unruly crowd of kids pushing up against the stage and to their parents who let them run free, lengthy discourses on the values of order and discipline. He also spoke of community and national identity and values: civic responsibility and the necessity of voting (the pageant took place a few days before the national election), and education as the future of Uaxactún, particularly a future that would provide alternatives to living off the forest. “Uaxactún,” he announced grandly at one point, “is the most important community in the reserve!” He explained that this was due to their “culture of conservation,” reminding villagers of the widely shared dream of an upwardly- and urbanly-mobile younger generation, closely linked to discourses of forest conservation.

Our determination of winners at the judging table was prolonged and difficult, resulting in the creation of a new third place title, the niña monja blanca (named for Guatemala’s national flower), invented to dispel the controversy. And although we judges had been selected from outside the community – a fact repeatedly emphasized by the MC throughout the proceedings – the following day there was still plenty of gossip about who had won, and why. When Julian and I showed up at Gloria’s comedor (informal restaurant) the next day, it was the sole topic of conversation: “I’m a little disappointed at who did win,” Gloria told us. “Only because people are now talking... the girl who won is one of my son’s students, and since you two and two of the other judges eat here with me, people are talking, you know.” It didn’t matter that
there was no money won, or that we were unaware of this obscure connection; the
stakes were still high and rumors and speculation were flying. “Still,” Gloria
reassured us, “it’s nothing like it was before.”

**Ethnicity**

These two village school events inside the reserve reflected vast differences
between the communities’ land tenure status, livelihoods, and ethnolinguistic identity.

Uaxactún is composed largely of *Peteneros*, families that can trace several
generations of local history living and working in the region’s forests and extractive
industries. The village is mostly Ladino (80% as of CEMEC’s 2001 census), with a
few people claiming Q’eqchi’ or Itza’ Maya or mixed heritage, and Spanish is spoken
by all residents. The residents of Paso Caballos, on the other hand, are nearly all
Q’eqchi’ Maya, an indigenous group native to neighboring departments of Guatemala
(particularly Alta and Baja Verapaz) who migrated in large numbers to the Petén in
the late 20th century (see Grandia 2012 for a history of repeated cycles of land
dispossessions and migration among the Q’eqchi’). In Paso Caballos many residents,
especially women and older men, do not speak any Spanish, isolating them from
direct communication with the many state and NGO representatives constantly
passing through their village.

Many people in the Petén echo a common stereotype about Q’eqchi’ vs.
Ladino communities. The indigenous villages are said to be more tightly knit and
united, but harder to get to know or work with due to being closed off to outsiders.
Ladino villages, on the other hand, are said to be more divided and individualistic,
with each person out for themselves but happy to use outsiders to their advantage when the opportunity arises. This makes conservation and development work in these villages easier, as Ladinos are said to be adept at understanding the benefits they might accrue through external projects and connections. This differentiation was made to me by both Guatemalan and, to a lesser extent, foreign NGO workers; by Guatemalan state actors; and by both Q’eqchi’ and Ladino villagers as well. These discourses of who is and is not capable of participating in conservation reinforce traditional power hierarchies and informally exclude people from the benefits of conservation and development projects and decision making in the Maya Biosphere Reserve (Sundberg 2003; Rahder 2008).

Mostly these differences were expressed without context, as if they were natural facts about Maya or mestizo village organization, but any truth to these stereotypes has grown from a long historical trajectory. Maya people in Guatemala began to form “closed, corporate communities” in response to the aggressive agrarian dynamics of first colonial (1600-1870) and then liberal modern (1871-1944) Guatemala, a trend that was solidified in the 1920s when large scale plantation agriculture overtook rural smallholder land and livelihoods (Wolf 1982; Handy 1990; Handy 1991; Colchester 1993). This retreat into tightly knit social worlds offered indigenous groups some protection from the external forces seeking to take their land and exploit their labor, and this isolation was further reinforced by state policies that marginalized Maya populations (Smith 1990a; Smith 1990b). These differentiations between Maya and Ladino were simultaneously broken down and fortified by the
ethnically-charged violence and resettlement programs of the civil war (Nelson 2009).

The distinctions between indigenous and Ladino also take on a unique cast in the Petén, as the Maya population "native" to the region (the Itza’) are now greatly outnumbered by Q’eqchi’ migrants. Q’eqchi’ in the Petén trouble the notion of ‘belonging’ to a place by virtue of their movements and multiple attachments (Grandia 2012), and challenge the idea of a shared pan-Mayan identity: locally, the word ‘Maya’ is used to refer strictly to the Itza’, while the Q’eqchi’ remain distinct. Q’eqchi’ are plotted on national ethnolinguistic maps as ‘belonging’ to other regions of the country, including the Southern edge of the Petén and neighboring departments of Alta and Baja Verapaz. But Q’eqchi’ migrants are often deeply emplaced in the Petén, and may have been in the department for all of their lives, although movement between communities (usually pushing further North over time) is common. At the same time, these migrants continue to be tied to other regions of the country (and to neighboring Belize) through family connections or through memory.

Ethnicity and belonging are thus complex questions in Paso Caballos and Uaxactún. In their pageants, some of these differences in local identity, belonging, and history could be seen: in Uaxactún, the girls' costumes were related to local identity and history, mixing colonial era folklore, ancient Mayan symbolism, and modern agricultural and forest concession livelihood activities. In Paso Caballos, however, the costumes were strictly relegated to the ecological world, with the exception of a single costume representing local agriculture. The ease with which
identity and belonging were expressed in the former, while no thought was given to Q’eqchi’ identity, history, or representation in the latter, is indicative of the differences between those who are seen to belong (or not) within the Petén and the Maya Biosphere Reserve.

Land Tenure Status

The differences in the pageants' representations of historical and ecological themes reflects more than simple ethnic identification. The range of costumes in Uaxactún and emphasis on local wildlife in Paso Caballos are also indicative of the two communities’ different spatial and administrative location inside the Maya Biosphere Reserve. Uaxactún has a community-run forest concession in the Multiple Use Zone, land owned by the state but managed by villagers for sustainable timber harvesting, harvest of NTFPs, and small-scale milpa (swidden) agriculture in defined areas. The village manages the concession under 25-year contracts with the state, and draws on varied local livelihood activities: paid work for the concession in timber harvesting, milling, or administration; jobs in neighboring Tikal National Park; assisting archaeological studies in the dry season; independent NTFP harvesting; and agriculture. Paso Caballos, on the other hand, is located inside Laguna del Tigre National Park, part of the human-exclusive ‘nuclear zone’ of the reserve. The Q’eqchi’ who settled at Paso Caballos in 1992 arrived after the official declaration of the Park in law in 1990, making them ‘invaders’ although their presence preceded the park’s practical establishment on the ground by several years. As such, the village managed to sign an agreement with CONAP in 1997 that granted the village semi-
CHAPTER THREE: A Reserve Full of Rooftops

legal status inside the park, alloting them use rights of highly regulated agricultural parcels and a minimal patch of communal forest reserve from which to gather wood, palm thatch, and other resources. Limited by this strict agreement, the village subsists almost entirely on milpa agriculture for direct subsistence and some monetary income.

Both communities have long histories of state and NGO intervention into their lives and livelihoods, but they are, in many ways, at opposite extremes of conservation and development practice in the Maya Biosphere Reserve. And while both have seen many NGOs, state agencies, and projects come and go over the years, Paso Caballos has had minimal long term success with any project, initiative, or institution, and is generally perceived to be a threat held in abeyance – not destructive enough to forcibly remove from the park, but not fully integrated conservationists either. On the other hand, Uaxactún has seen slow improvements in village education, employment, services, and infrastructure as a result of their involvement with conservation activities (although not all of these stand the test of post-project time, either). And, as mentioned by the pageant's MC, the village now cultivates a “culture of conservation” that permeates local rhetoric, sense of place, and identity. The differences outlined here gloss over important internal differences – there are truly committed Q’eqchi’ conservationists in Paso Caballos, and plenty of would-be forest destroyers in Uaxactún – but accurately reflect their locations in differently zoned

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24 A more detailed history of the struggle to gain this agreement, and of the rights and responsibilities contained therein, will be detailed in chapter four.
areas of the reserve, and the vastly different opportunities and land use rights afforded to them in those spaces.

These different rights and limitations intersect with the above outlined ethnic differences in community "openness" to shape very different experiences of conservation and development "success" and "failure." For many years, beginning with the negotiation of its formal agreement in 1997, Paso Caballos worked almost exclusively with the Guatemalan NGO offshoot of Conservation International (CI), ProPetén. ProPetén gained full independence from CI in 2002, and soon after changed its priorities from integrated conservation and development inside the reserve to more strict development work (particularly health and agrarian development) in the Southern half of the Petén. Following these shifts, the NGO ceased working with Paso Caballos, sold its neighboring biological research station to another Guatemalan NGO, Asociación Balam, and WCS and Balam together moved into the village-level vacuum left behind. ProPetén had worked with the village on many different projects, including a health outpost, education initiatives, ecotourism development, and environmentally-sustainable agricultural improvements. None of these projects have survived to the present day, the reasons for which include but do not end with ProPetén’s retreat from the community. At present, WCS is the most regular presence in the village, aside from occasional short-term or small-scale projects from other NGOs. The US-based NGO maintains a house in the village, and has a dedicated staff person who splits her time between the village and WCS’s office in Flores.
There is a similar WCS house and staff person in Uaxactún, although the range of NGOs working in the concessioned village is much greater. While Uaxactún, too, can count an impressive number of failed projects and interventions, slow but steady improvements to village life and infrastructure over the years form a strong contrast to Paso Caballos. Access to education has improved significantly with the institution of a telesecundario (remotely taught secondary school), allowing students to study beyond the basic literacy level while remaining in the village. NGO technical support for the sustainable harvesting of timber and NTFPs has been constant since the concession was granted in 2000, with more recent support for financial and administrative management of the concession as well. The shared community and NGO interest in managing and maintaining forest cover in the concession’s boundaries create a clear zone in which the two can work together.

Finally, the two villages’ different locations in the reserve and related designation of ‘belonging’ greatly differentiate their senses of security and long-term rights and access to the land. People in both communities frequently expressed concern about losing their land, homes, and livelihoods, as state ownership of all land in the Maya Biosphere Reserve ultimately trumps all other temporary agreements. In Uaxactún, the community is currently 14 years into its 25-year contract, but many villagers expressed worries that the state might kick them out if they did not manage the forest well enough, or if outsiders managed to invade the forest they were designated to protect. Still, this possibility seemed distant and was dismissed by most NGO workers – at least in the short term – due to the community’s strong record of
sustainable management to-date and NGO support as guardians of the forest. In Paso Caballos, on the other hand, though their signed agreement with CONAP has no expiry and has more or less held for 15 years, it exists in a tentative, uncertain legal limbo, leaving residents and conservationists alike in very delicate positions. By law, nobody is allowed to live in Guatemala’s National Parks, making access to government approval (let alone funding) for education, health, or other initiatives nearly impossible to secure. Ultimately, while Uaxactún has more legal claim and institutional support for their presence, both villages are subject to the fundamental uncertainties of the future Guatemalan state.

**Economics and Livelihoods**

These differences in land rights directly affect each communities’ livelihood strategies and options. Paso Caballos relies solely on agriculture for both subsistence and (if they can produce enough) cash income, while Uaxactuneros maintain much smaller milpa plots supporting family subsistence and rely more on monetary income from a variety of sources, particularly NTFP harvesting in the concession and employment with conservation and archaeological institutions working nearby (figure 3.3). While villagers in Paso Caballos may not describe themselves as ‘poor’ – based on the sole criteria that their families are not starving – they lack financial security, diversity of income sources, good local health or education options, secure access to clean water, and many other markers of wellbeing. In Uaxactún, where income is distributed more unevenly than in the Q’eqchi’ village, families usually rely on several different income sources throughout the year, in addition to the food they
grow and gather themselves, and education, health, and other infrastructural supports are much more well-developed.

These economic differences between the two communities were visible in their pageants. In Uaxactún, the contest had three stages featuring three different outfits, and the contestants’ families were clearly expected to invest in the activity and to purchase clothing and costumes from outside the village. In Paso Caballos, each girl wore only a single costume, and their outfits were visibly constructed by the participants and their families with materials provided by the school. While Uaxactún’s pageant was a major event, drawing adults and children alike from across the village to their communal salon, Paso Caballos’ event had only a scattering of parents and curious adult onlookers mixed into the crowd of costumed kids in the
dusty schoolyard. Overall, the level of formality, organization, and discipline present in the two events reflected the differences in access to resources, political and economic marginality, and exposure to and integration in ‘mainstream’ (Ladino) cultural values and norms.

Population Dynamics

Finally, to return to the question of human population dynamics and monitoring, a rooftop does not mean the same thing in each village. In Uaxactún, many “households” have two or three rooftops, reflecting the common separation of the kitchen into a separate building and legal access to forest materials for community use, such that even poorer families within the village may be able to construct multiple wood-and-thatch buildings. At the same time, the community’s forest concession has slowly increased local incomes and financial security, and Uaxactún, as one of the more legally secure communities in the reserve, also has a much higher proportion of non-household buildings than many: school buildings, churches, a sawmill, carpentry workshop, locally-owned ecotourism hotels, offices for the concession management organization, and a compound of buildings belonging to NGOs and IDAEH, the national archaeological institute. Although anyone who knows the village can easily identify these rooftops, CEMEC cannot take the time to get to know each monitored village, so each of these buildings is counted as holding an estimated 5.5 people.

25 In a quick count I was able to identify 25 non-housing rooftops in the 2011 photograph, accounting for nearly 10% of the current population estimate, and I am unfamiliar with the locations of small stores and churches.
In Uaxactún, the question of local population numbers was actively debated among NGO staff working in the village and representatives of OMYC (Management and Conservation Organization of Uaxactún), the community’s concession management non-profit. Multiple attempts to count the community's population have come up with numbers ranging from 724 to 1700, and per-family averages of between 4.79 and 11 people (Zetina Tún 2011). Part of the issue stems from different counting and estimation methods – rooftop counts, surveys, or even a "mental census" in which people sat together and imagined a house-by-house walking tour of the village – and part from the complex dynamic of people entering and leaving the village. While the community has maintained its strict policy of no immigration of new residents, those who leave the village to seek work for a single season or for many years may return at any time, with exact counts of who lives in the village at any time extremely difficult to obtain. Still, residents and NGO staff familiar with the village agreed that CEMEC's aerial estimate was too high, and its reported trend of slow and steady population growth was in contrast to the locally-perceived shrinking of village numbers.

These claims that Uaxactún’s population is shrinking are based largely on the effects of the recently-constructed telesecundario, following which many young adults have started to leave for the central urban area for further schooling or to find jobs. In addition, both interest in and access to birth control and (voluntary) sterilization for women in the village has increased enormously with a semi-regularly staffed health outpost, and the occasional arrival of women’s health projects in the
community. In general, families are getting smaller, and more parents express the possibility and desire for their children to grow up with education and opportunities that will move them away from the village and its forest livelihoods. Some women, including prominent members of the community, proudly talk about their decision to undergo “the operation” to prevent more children, and of their efforts to convince other women to do the same. During one of my visits, Gloria proudly explained that birth control and reproductive education efforts were clearly working, as 2011 was the first year in memory when the local school had not lost a female student to pregnancy.

In Paso Caballos on the other hand, the 5.5 people per rooftop estimate is more likely to be on the low side. Families commonly have 8 or 10 children, all crowded together in single houses – lower incomes, more limited land, and less access to forest building materials means that many households fit all their sleeping, cooking and other activities under one roof. A few households do build multiple buildings, but these are often quickly filled by extended families living together in close residence. Here, in contrast to Uaxactún, there are only a few buildings that are not used for housing: a scattering of over-crowded schoolhouses, churches, and a single communal meeting hall. As a result, CEMEC’s population estimates are more likely to be accurate in Paso Caballos than in Uaxactún. However, the question of measuring and monitoring indigenous migrant population inside a park carries extremely different valences than the same activities for a traditional Petenero forest community.
Unlike in Uaxactún, neither villagers nor NGO staff are likely to provide alternative population estimates. Instead, inquiries about the number of people in the village are either ignored outright or turned into a discussion of women’s health and access to birth control, or to the delicate politics of immigration into the village. While women seemed very interested in birth control in the abstract, linguistic barriers, poor project design, lack of education opportunities, and male objections have prevented most women in the village from taking advantage of various reproductive health initiatives that have passed through, and many girls marry and get pregnant at 15 or 16. In addition, while new immigration is strictly prohibited by the village’s agreement with CONAP, many people consider their relatives to be exceptions to this rule, while others expressed an empathetic refusal to reject newcomers: how can I turn another indigenous family away? As birth rates boom and family members continue to immigrate in from outside the reserve, the strictly delimited boundaries of the village have led to greater density of residences, creating increasing pressure on the thin, nutrient-poor soils allotted to their agricultural area and severe pollution of the slow-moving headwaters of the San Pedro River along which the village is built (a recent test found 1000 times the safe level of fecal coliform in the water, used for washing and bathing).

So while it is true that, as indicated by rooftops, the population of Paso Caballos is growing much more quickly than that of Uaxactún, CEMEC's estimates in both places may not reflect their true populations and reveal little about what kinds of sustainable development or conservation interventions are needed or will work in
each place. The proliferation of rooftops in Paso Caballos is frequently used as an illustration of the population “threat” to the reserve’s forests, as seen in the formal presentation to president Alvaro Colóm. But in fact, the people in the village, scared of being evicted from the park and losing their tentative land rights, have densified the small village without infrastructural support rather than expanding into neighboring parkland, resulting in major environmental, health, and social problems that are unrecognized by a population-leads-to-deforestation framing. Using this reserve-scale data to understand local dynamics or make village-level decisions leads to conflict, problematic assumptions, and contradictory understandings of human-environment dynamics.

**Decentralized Decisions**

The reserve-wide population enacted by aerial monitoring stands in sharp contrast to the enactments at the village level in both Uaxactún and Paso Caballos, albeit in vastly different ways. In Uaxactún, instead of a growing village of over 1600 people, locally-derived estimates state that the village has less than 1000 residents and is growing smaller every year. In Paso Caballos, rather than countering official estimates with numbers obtained through alternative counting methods, villagers tend to talk about population by way of its causes and effects – reproductive health, immigration rules, sanitation, health, and education. In both contexts, workers from both state and non-governmental institutions regularly confront the question of which version of population to accept when planning for conservation and development.
projects. And in practice, it is usually left up to individual field practitioners – technicians near the bottom of the institutional hierarchy – to work out the appropriate response according to their own political beliefs, social ties, and understandings of the evidence.

In Uaxactún, WCS’ resident staff person, Juan, was extremely concerned with the question of population, running over conflicting numbers with staff from other institutions, village leaders, and myself for several months after CEMEC’s annual report was released in 2011. Juan even participated in the “mental census,” sitting down with a small group of community leaders who imagined themselves walking through the houses and counting who lived in each one. This exercise, unimaginable in larger contexts, closely echoed the way that Josue and Marvin interpreted the aerial village photograph I showed them in my opening story, using their rich, detailed knowledge of residents’ comings and goings to fill in an image of rooftops with human names and stories. Following this, Juan decided that the population was in fact around 800 people, and stable or shrinking, and he began including that local estimate in his reports and work plans.

Building on his strong social connections to village residents and seven years of experience in the community, Juan ultimately used local understandings rather than official state estimates to make decisions about what kinds of support the community most needed from WCS. He met with little resistance in doing so, as the population of Uaxactún is not generally understood to pose a direct threat to the concessioned forest surrounding the village, so the concern with ‘population growth’ is not especially
powerful in this place. What did concern Juan was trying to understand the reasons that the village was shrinking, and how that might affect his work and planning. If, for example, young people were leaving for further education after completing their secondary school training, were they likely to return to the village afterwards, bringing with them new skills and expectations? If people were leaving to find work, were they sending money back to their families in the village? Were they planning on returning? These questions arose directly from local population estimates and understandings, and are framed by Juan’s strong local ties and personal experience in the community.

On the other hand, in Paso Caballos, different enactments of a growing population have caused conflict and disagreement between community members and state and NGO representatives. Villagers, when pressed to discuss population, insist that the growth does not include letting in “outsiders,” which is against the rules of their agreement with CONAP. They report instead that any growth is due to the high birth rates in the community, and to close family members who move to join them – a definition of insider/outsider that differs from state understandings that strictly limit “insiders” to those who were present at the 1997 signing of the agreement and their direct descendents. In meetings with external institutions, villagers repeatedly emphasized the need for better schools for their children, local health services, and access to clean water, while CONAP continues to insist on the priority of intensifying boundary-maintenance around the community’s territorial limits and on agricultural
fire management practices – priorities clearly determined by an understanding of human population and presence as a threat to the surrounding forest.

These two sets of priorities are both closely tied to questions of the village’s population dynamics, but respond to extremely different enactments of the population-environment question. As a result, WCS’s technician who has worked in Paso Caballos for five years, Rosa, found herself repeatedly torn between the competing visions and priorities of local villagers and CONAP. Her job required close coordination with both sides as well as a commitment to the conservationist mission of WCS, and the incommensurability between these enactments of population manifested in a frequent sense of uncertainty and anxious changes of plans in her strategies and decision-making. Rosa felt a serious responsibility towards the villagers and their needs, but also to the conservationist goals of CONAP and WCS, which pushed back against villager demands. In this case, decentralizing responsibility for making sense of competing versions of population led to more conflict and distrust, as Rosa was blamed for “changing her story” and the ultimate failure of many interventions, when in fact she was caught between the incommensurabilities of different ontological enactments.

Conflicts over who belonged in the village were particularly problematic for Rosa and her work. WCS has formal, written Acuerdos de Conservación (Conservation Agreements) with both Uaxactún and Paso Caballos, a Conservation International-led program providing two years of structured funding for specific conservation and development activities in return for observation of new rules,
The Acuerdo in Paso Caballos included provisions for temporary employment for villagers during the fire season, the hires to be selected by the village COCODE (Community Development Council, a village-level government structure introduced through the peace accords to increase community political participation) and approved by full community assembly and Rosa. However, at the beginning of 2012, the newly elected COCODE chose to hire two men who were not on the original census roll of the village’s agreement with CONAP. Rosa, as representative of an NGO committed to upholding this original CONAP document as part of its secondary signed agreement with the village, refused to hire the men, causing conflict and resentment among the COCODE and delaying the beginning of work on clearing the fire break around the village. She was forced to recognize publicly that she was contradicting the village council’s choice, even as she tried to argue that her work consisted only in supporting their decision-making processes. And, as she complained repeatedly, if any fire passed beyond the break into surrounding parkland, she would take the blame for failing to work out the problems in advance – not the villagers, not CONAP, not WCS as an institution, but her. As a field technician, Rosa became responsible for enforcing the question of

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26 These Acuerdos de Conservación are part of an international CI-led initiative that is slowly spreading, via partnership with WCS, across the reserve. Uaxactún was the first village to sign an Acuerdo in 2009, with Paso Caballos following in 2010, along with several other villages. In both cases, the village’s COCODE, WCS, CI, and CONAP are signatories, along with OMYC in Uaxactún, and all Acuerdos are approved by majority vote in an open community assembly.

27 This story is presented in much greater detail in the next chapter, focused on fire in Paso Caballos.
local belonging, and for the complex consequences of that belonging for the surrounding forest.

*Clashing Populations*

In both Uaxactún and Paso Caballos, the responsibility for determining which enactment of population will prevail in conservation and development projects falls upon the technical field staff, who may – like Juan – be well equipped to draw on local knowledge and social ties to frame their decision, or who may – like Rosa – be heavily burdened with the contradictions between competing commitments and priorities. In Uaxactún, the relative stability, privileged local history and Ladino-Petenero identity, and administrative location in a contracted forest concession allow a certain degree of flexibility and maneuverability within which villagers, NGOs, and state representatives can hold different population estimates and understandings with little to no conflict. In Paso Caballos, however, the looming threat of migration into Laguna del Tigre National Park, troubling discourses about indigeneity and population growth, and conflicts over definitions of family and belonging lead to blunt demonstrations of power that overrule local ontologies in favor of state-dominated technical enactments.

The case of population in the MBR pushes on the political side of ontological politics, particularly as described in Mol (2002), in which she deals with the various ways in which multiple enacted realities “hang together.” In Mol’s text, multiple ontologies can appear singular through a variety of means: one might “win” over the other and become the generally accepted reality, one might be translated into another,
they might get added together, or they might remain completely distinct but
distributed such that reality remains multiple, though never plural (Mol 2002). In this
case, however, there is conflict not only between different enactments of population,
but also extreme inequality – economic, political, and social – between state GIS
technicians, CONAP leaders and politicians, NGO field practitioners, Petenero
villagers, and Q’eqchi’ agricultural migrants, and a long history of violence and
exclusion that shapes the meeting of these realities.

Bridging the ontological turn with the idea of epistemic violence from post-
colonial theory (Spivak 2009), the triumph of the reserve-wide remotely monitored
population over local enactments may be considered a form of ontologic violence – a
denial and suppression of other worlds. In the case of Paso Caballos, this violence has
impacts not only on villagers, whose lived realities are routinely denied by the
priorities of protected area law, but also at those who end up caught in between
competing realities, like Rosa. Understanding this situation as a conflict between
different enacted realities, rather than perspectives on a single population object,
displaces the possibility of turning to rationality as a means of determining action;
seeking a ‘true’ understanding of population and growth dynamics in Paso Caballos
will not offer a way out of this conflict. But if, as Mol suggests, a focus on
enactments moves us from a politics of who (whose perspective counts?) to a politics
of what (what is to be done?), how do we begin to account for situations in which the
social positions within which different enactments are formed come together in such
extreme inequality and violence? How do we deal with the fact that disregarding the
'who’ – the positionality of being indigenous, migrant, agriculturalist – is an untenable political position? Can the subaltern enact? While the symmetrical analysis of ontological politics analytically places multiple enacted realities on even ground – and this is the heart of the theory's often hopeful politics, the possibility of worlds otherwise – the extreme asymmetry between enactments resulting from differently situated practices and epistemologies can repeatedly exclude and deny the lived realities of those most marginalized.

**Conclusion**

It is unsurprising that aerial photography has become the standard method to estimate population in the Maya Biosphere Reserve. It is cheaper, quicker, and easier to fly over many villages in a number of days than to conduct full on the ground census surveys, despite the much more detailed information that can be gained from a traditional census. Once you factor in notoriously poor national census procedures, conflict-laden reluctance among many villages to volunteer information to CONAP, and the charisma of ‘objective’ photographic methodologies that appear to stand above the fray of the reserve's problems, it becomes difficult to imagine alternatives. But, as is abundantly clear inside these monitored and counted villages, aerial population estimates are not necessarily accurate or helpful information, particularly in contrast to on-the-ground enactments of population dynamics.²⁸

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²⁸ CEMEC technicians are deeply aware of many limitations and potential issues with their estimates, but these limitations were discussed only in response to my questions,
Still, there is a broad preference for turning to CEMEC’s centralized, reserve-scale information in a wide variety of conservation contexts, and this preference has important political implications. In its construction of a coherent reserve scale and a measurable population object that neatly fits within it, aerial monitoring is a very useful and powerful tool for garnering support for protected areas and conservation initiatives from national governments and international donors. While there are many problems with the population/deforestation framing, it is still one of the most familiar and convincing environmental narratives around. In the presidential palace, telling a complex story about ethnic identity, poverty, and failed health projects in an illegal migrant community inside a National Park would not lead to greater budgetary allotments for protected areas. But that same discourse is extremely problematic when carried down into smaller scales: using the troubled and marginalized Paso Caballos as the photographic emblem of a “population problem” in PowerPoint presentations, while Uaxactún is congratulated for its good conservation practices, ignores the incredible social, historical, and economic differences between the two communities, further solidifying the gulf between them.

In the end, it often falls to NGO and state field practitioners to make sense of contrasting enactments and scales of population in the reserve. This decentralization of decision-making in village level conservation and development projects is a double-edged sword. People working in the reserve’s communities come to closely know the particular local dynamics of the places they work, and this can be an
incredible boon when they are faced with different enactments, such as Juan's informed preference for local population estimates in Uaxactún. On the other hand, it becomes their individual responsibility to negotiate between conflicting enactments and priorities, leaving others, like Rosa, in the middle of intense hostility. Overall, this dynamic creates a rough patchwork of decision-making processes that reflect individual practitioners’ political preferences, evaluations of evidence, and social ties, rather than any coherent overall vision for community-based conservation.

The ability to settle upon a single ontological version of population works differently in different places, affected by the many structural forms of inequality shaping the enactments that come into contact. It is easy enough to distribute different enactments in some places (Mol 2002): to let population be undifferentiated threat to the forest in the National Palace, and a complex dynamic of education, employment, and migration in Uaxactún. But Paso Caballos' enactment of population (or anti-population, since theirs is a refusal to be counted) is repeatedly denied, with consequences for both villagers and those who attempt to work with them. The effects and confusions of these clashing ontologies, identities, and power relations in the Q'eqchi' migrant village are the subject of the next chapter.
CHAPTER FOUR

Fire at the Edge of the Forest

Fire is many things. It burns, it warms, it cooks, it destroys, it kills. Fire is process, transformation, it never sits still. In the Petén, it is always started by humans, but never under human control. The multiple ontologies of fire — tool, weapon, threat, heat, image — do not sit neatly alongside each other, they do not add up to something new, or translate into each other, their distribution across time and space always burns around the edges. These terms — addition, translation, distribution — come from Mol (2002), in which they are presented as mechanisms through which multiple ontologies coexist while seeming singular. While many of these mechanisms are operating on the ontologies of fire in Paso Caballos, it is their failure to create singularity and the lack of closure, agreement, or translation to which I wish to draw attention. This chapter presents multiple firey realities, without attempting to bring them into harmony or control their flames: as a pixelated satellite reading of infrared
heat, as a threat to rich primary forests, as a tactic of genocidal terror, as an expression of the discontent of the oppressed, as a tool of agricultural life. There are many more fires, too, that I do not explore — the open cooking fires of village homes, the clearing fires of cattle ranchers, the smoldering piles of plastic trash in a village without waste services, the smoke and particulate ash that thicken the Petén's air from February to May each year with unknown health effects — but the flames of all these, too, lick into the edges of the stories presented here.

With a primary focus on the Q'eqchi' migrant village of Paso Caballos in 2011 and early 2012 — pulling from other times and places — this chapter also walks several edges: between the Maya Biosphere Reserve’s success and failure, war and peace, conservation and development, forest and farm, individual and institution. Paso Caballos teeters precariously on these edges, its future deeply uncertain. Edges mark *identity* — not individualized selfhood, but the clarity of a thing made whole by its juxtaposition with another. Edges mark relations of difference, draw boundaries laden with power, value, and meaning, and make the identities produced by difference seem natural, given. But like the fires that illuminate them, the edges presented here (and those things between which they differentiate) are never settled or clear, but shift and blur with each new look.

This chapter is fragmented. I present five fires — ontological multiples produced by different practices — and five edges — encounters, differences, and distinctions – all of which interlock and overlap but do not form a whole. Each of these pieces is further fragmented, containing moments, arguments, processes, and
practices that share points of partial connection across time and space, but are left smoldering, not yet cooled into the ashes of final representation. The fragments' arrangement means that a story’s middle might come before its beginning, and another story may not find an end. Exposition, explanation, and interpretation are left to a minimum, though of course the ordering of fragments suggests a particular reading, setting up its own edges and juxtapositions.

Fire I: A Pattern of Pixels

February-May, 2011. It is the dry season, the Guatemalan "summer": daily temperatures in the Petén hover around 35C (95F), shooting up into the 40s (115F) every week or two; less than one inch of rain falls across all four months. It is the hottest time of the year, the fire season, and the CEMEC computer lab is at its coldest, the aggressive air conditioning explained as technical necessity: with the heat of all these machines, the already extreme temperature would become truly unbearable. The large air conditioner unit mounted in the office sits directly above the Director’s desk, positioned such that his seat was the warmest in the office, with my own temporary desk positioned at the apex of the blast at the far end of the room. A temperature gradient traced the office hierarchy: Victor Hugo, David, and Luis (the technicians who had worked for CEMEC the longest), sat comfortably in diffuse cool air, while my desk-neighbors and I stashed jackets, blankets, hats, and gloves in the office to keep out the chill. Like its Skype-silence, this cold marked CEMEC as a
space of difference, and moving between the office and the un-air conditioned hallway to the rest of CONAP was a painful shock.

In cold CEMEC, fire is no hotter than any other digital image. Fire is a pattern of pixels, something detected by foreign-owned satellites, downloaded as raw data, electronically mapped, and sent via email and website to interested parties. When the computer lab was founded in 1996, they didn't have air conditioning yet, and smoked in the office. The lab's first task, with three staff people and a single computer, was simply to digitize area and topographical maps of the region, tediously hand-tracing the territory into new computerized form. But in 1998, the fledgling institution met its first major challenge: an el niño year, with major forest fires raging across the reserve. The lab stepped up and played a major role, downloading and analyzing publicly available satellite data from NOAA's website at 1km resolution, requesting higher resolution images when they were available. These old NOAA sensors, David told me, were poorly calibrated; they would often show fires in the middle of Lake Petén Itza, so the images had to be checked and corrected by hand before they made any sense.

These days, daily reporting of satellite-detected fires is a streamlined process. The MODIS satellite, a NASA system for global fire monitoring, passes over the Petén twice a day, in the morning and afternoon. The images are available for free at 1km-pixel resolution, and each pixel in which fire is detected is called a "hot spot"
(punto de calor). The satellite's second pass captures most daily fires, with the data appearing online around 4:30pm. This leaves just enough time to download the raw hot spot data, create a map of fires detected, and send this out to the fire season email list — all individuals and institutions interested in seasonal fires — before the end of the office day at 5pm. One technician in the office is put in charge of these daily reports for the entirety of the fire season, and described the process to me: “It’s not difficult, either, but, I have to download the data from the webpage… I download them, export them, put them into the map, and that’s it. The map is already made, it’s a basic map. You just have to change the date, a few little details, and that’s it.” Mundane, easy.

These daily reports include total hot spots detected across the whole Petén, and a map showing where they were located (figure 4.1). On some days, the reports indicate how many of these hot spots were located inside protected areas, and occasionally include additional maps of specific protected areas, most often Laguna del Tigre or Sierra del Lacandón National Parks. Sometimes, these reports don’t match up with what people find on the ground. Marco Gonzalez, director of the forest fire department of CONAP-Petén, who first introduced himself to me as “hotman,” noted that fires might be more or less severe than indicated by the reports, exist in places that didn’t get caught by satellites, or be reported in places where his team

29 NASA MODIS satellites capture data at three resolutions and multiple levels of sensitivity. The 1km^2 resolution images of hot spot data used by CEMEC are available online very quickly as part of the MODIS Rapid Response program, though the sensitivity of the instruments can be much greater than 1km^2. This means that the satellites routinely detect fires as small as 30m x 30m (900m^2), but will mark the whole 1km^2 pixel within which the fire was detected as "fire present."
could find no evidence of fire once they reached the site. Still, he insisted, the reports were an invaluable tool, making his work of directing CONAP’s fire response teams enormously easier.

At the end of every week, a standard report is written up and distributed to the email list as well as posted online. These reports include: 1) a map and description of hot spots detected in the previous week, including how many were in protected areas;\(^\text{30}\) 2) a line graph of cumulative precipitation beginning from January 1, with comparative lines tracing the previous past ten years of precipitation data and a brief

\(^{30}\) Sometimes these maps show hot spots from just the previous week, sometimes they show all hot spots of the year-to-date.
narrative description of how current precipitation patterns compare to previous fire seasons; 3) a graph of annual to-date Keetch-Byram Drought Index data from seven INSIVUMEH (national weather service) weather stations, a measure of vegetation dryness related to risk of fire; 4) paired photographic images from the beginning and end of the week, indicating phenological conditions related to dryness, especially loss of leaves from deciduous trees; 5) precipitation forecasts for the coming week, from NOAA; 6) temperature forecasts for the coming week, from NOAA; 7) a brief conclusion summing up the severity of fires in the previous week, and color-coded “alert level” for fires for the upcoming week. Occasionally other items are added to these reports: photographs of smoke, detailed reports on particular fire events, images from monitoring flights of fires in progress or burned areas, etc.

Email distribution of daily reports began in 2004 or 2005, and in 2011 the reports were also added to the CONAP website, even more accessible than before (at least to those with computer and internet access). In 2011, daily emails began in late February when the rains ended, with both daily and weekly maps and reports covering a fire season from early March, when the first MODIS hot spot appeared, to April 26, the final daily report. The timing of the fire season means that CEMEC is one of the few offices (especially in the government) that continue to work through Semana Santa (Holy Week, the primary vacation period in Guatemala). Two technicians and Victor Hugo each took home laptop computers from the office (the oldest of which, partially fire damaged, has been given the nickname chicharrón, “the
pork rind”), divvying up vacation days for daily coverage of hot spot reports. Fires do not take holidays.

According to CEMEC’s staff, 2011 was a “really good year” for fires: more rain than usual, fewer fires, and very few that passed beyond well-maintained fire lines into “pristine” protected forest. This assessment was made in the computer lab both by way of hearing from friends, colleagues, and relatives working field fire crews, but also by reading the comparative graphs in the weekly reports and by looking back through previous annual fire maps and images. One day in late April, as a technician was getting ready to send out the daily report, he commented on how few hot spots appeared, and others in the office gathered around his desk as he started opening files, maps, and images from previous years. The technicians began collectively pooling memories of what bad fire years felt like, outside the office — we could tell this year wasn’t so bad, it wasn’t even that hot outside, compared to some years — Some years, we would just be dripping with sweat! — And the smoke, sometimes the smoke is so thick, even here in the central urban area, that you can barely breathe, you can see little pieces of ash floating down like rain from the sky — that’s how bad the fires get. As they reminisced about the worst fire years, they sought out satellite images from those years to illustrate and verify their bodily memories: 2003, 2005, 2006, 2007. David piped up, “I already showed Micha the one where the smoke reached all the way to Miami! But show her 2005,” he directed.

Indeed, David had previously given me a tour of his own historical archives, digging through years of image files that he had saved, including 1998 NOAA
satellite images of smoke clouds blooming up from Central America and crossing the Gulf of Mexico towards Florida. David had everything saved that he had ever worked on, every map, every satellite image. “It’s history,” he told me, “it’s good to save them.” He reminisced about the day that he downloaded the image of the 1998 fire:

I still remember that day. The dark cloud came up suddenly, and the heat, I went running for the bus. It was 4, 5pm, late by then. And the next day I saw the image. They were good images, this one was the best there was. But the hot spots were no good…. They showed up here, see? [he opened a map file with a hot spot in the lake], And why, the lake, was it burning or what? The sensors weren’t well calibrated. That problem doesn’t happen anymore.

He clicked through more images, continuing to reminisce about extremities of fire, wind, and rain, all through satellite images: “in ’98, after the forest fires from el niño, there was a hurricane here. Here [in the Petén] it didn’t rain much. But I would sit here in the office until 5 everyday, looking, watching this site [NOAA]. There was a little wind, but not that much. But here, I was on this website.” The sensors may have changed over time, but the experience of fire, climate, and landscape as digital images has not.

**Edge I: The Threat from the West, or Conservation Success/Failure**

Laguna del Tigre is the largest National Park in Guatemala, its nearly 3000 square kilometers covering an expanse close to that of the USA’s Yosemite National Park. The park was created along with the rest of the Maya Biosphere Reserve in
1990, although CONAP had no physical presence in its boundaries until 1996 (Parks Watch 2003). Even a CONAP study of human settlements in the park only began its historical review of governance activities in the year 2000, leaving the entire first decade of the park's existence noticeably absent (CONAP 2006). That absent beginning was the beginning of the park's end: between 1986 and 1995, forest clearing in Laguna del Tigre represented about 14% of all forest conversion in the reserve (including the unregulated buffer zone), with rates within the park more than doubling between the periods 1986–1990 and 1993–1995 (Sader et al. 2001). Without institutional presence, early waves of migration into the park only increased after it was declared rather than slowing down.

These overlapping historical claims on the land – a protected area and an agricultural and resource frontier – have led to today’s most common characterization of the park: the wild, wild west. Coincidence, that the westernmost parks of the Maya Biosphere Reserve correspond in their cartographic orientation to this U.S. American frontier phrase, imported via conservationist discourse. The characterization shows up everywhere from casual conversation (including inserted in English into Spanish conversations) to refereed publications (e.g. Gould 2006). It calls up lawlessness, gunfights, and a violent and unbounded rush for resources. All of these take place in Laguna del Tigre.\(^{31}\) As a North American working with a Guatemalan NGO told me:

\(^{31}\) Sierra del Lacondón National Park is also often included in this "wild west," and has similar but somewhat distinct dynamics at play. The park does not share any borders with "intact" regions of the reserve as Laguna del Tigre does, so while the it is the subject of major concern for its own forests' sake, it is not seen as constituting the same level of threat towards the rest of the reserve. Sierra del Lacondón is co-
It really is the wild, wild west. Land speculation, illegal logging, looting, all this stuff just flowing up into Mexico, people getting shot all the time. And I mean, imagine the kind of people who are drawn to that situation. Pure greed, that's the only thing. I don't know… I don't care if you're some poor campesino, there's no reason to be there except self-enrichment. It's just completely out of control.

The frontier has been spreading steadily North since the late 1960s, most successfully along the Petén’s Western edge where rivers and oil roads opened up new possibilities. Now, reaching its limits along the borders with Mexico, it is assumed that this frontier, this dynamic of violent conversion led always by fire, will turn towards the east: out of Laguna del Tigre and into the Multiple Use Zone and its better-maintained forest cover. While the Multiple Use Zone still holds a promise of conservation success, Laguna del Tigre is often considered "lost" to conservation, a failure advancing aggressively across the landscape. This threat drives the strategy known as “the shield” (el escudo): increased patrols year-round and fire brigades in the dry season, defending the edge between the areas of the reserve "under control" and those that have spiralled out of hand. Paso Caballos sits directly in line with this shield, marking its ambiguity: is the village a part of the shield, or a part of the threat? (figure 4.2).

administered with CONAP by the Guatemalan NGO Defensores de la Naturaleza ("Nature Defenders"), which is another reason it does not show up very much in this chapter or thesis: its day-to-day administration was segregated from the rest of the reserve. Defensores had a CEMEC technician dedicated exclusively to their work and park, but he was rarely in the CEMEC office during my fieldwork, spending most of his time with the NGO.
The poor, often indigenous peasants who came as part of the rolling agricultural frontier mix here with powerful cattle ranchers (drawn to this park over other areas in the reserve due to available water), drug traffickers, congressional politicians with rumored land holdings, illegal loggers and archaeological looters, and every once in a while, conservationists. But for many, agriculturalists still deserve the ‘blame’ for forest loss in the park, as they often do around the world (Tsing 2003; Forsyth 2002; Sundberg 1998; Kull 2000; Lambin et al. 2001). They are the first wave of land conversion, and their clearing edge is the most visible, field against forest. One of Asociación Balam’s staff, on a boat ride between Paso Caballos and the NGO's neighboring Scarlet Macaw Biological Research Station, insisted that we stop
the motor so that I could capture a good photo of the clear physical limit between the village and the station’s territory. “The agricultural frontier,” he named my photograph, despite the fact that this particular “frontier” has not moved or changed since 1997, nor is it likely to any time soon (figure 4.3).

There are international corporate interests in this wild west frontier, as well. African oil palm plantations have started pressing into Sierra del Lacondón to the south, but have not quite reached Laguna del Tigre. But oil itself was found in the latter park's wetlands long ago. The French-owned oil company Perenco currently has operating wells in the park, under questionably legal terms. The renewal of their
expir

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eased contract in 2010 was the subject of heated debates over protected area law interpretation, and was rumored to lead to the replacement of the Executive Secretary of CONAP, bringing in a leader who would support the 15-year extension of the oil company's concession. In exchange for this extension, Perenco contributed funding to the military's new "Green Batallion" for the park, directly bolstering military protection of their own interests. Military and police presence in the park have since continued to rise; within the first few weeks of Otto Perez Molina’s presidency in 2012, over 1000 additional troops were sent into the park.

But sending in the army can't solve everything. The question of what to do about human settlements inside Laguna del Tigre was the subject of a 2006 technical study (CONAP 2006), as well as a 2011 meeting in which NGOs were invited to comment on this study and its recommendations. Included in the document were a set of possible interventions for existing settlements inside the park, ranging from military eviction to assisted relocation with institutional support to written settlement agreements for remaining in place, similar to those already held by Paso Caballos and a few other communities. Settlements were to be sorted into action categories based on a combination of geographical, ecological, administrative, and social factors, as well as vaguely defined qualities like “conflictivity” (conflictividad) or “willingness" (voluntad) to cooperate with CONAP. Settlements got sorted one by one: How many people live there? How long have they been there? Are they bordering particularly valuable or vulnerable ecosystems? What are their political and financial interests and connections?
In the meeting designated for NGO comment on these classifications and proposals, it was revealed that the document had undergone a number of revisions since its 2006 version. Some settlements originally classified as “communities” were reclassified as large fincas (ranches or farms), with a single “owner” (though without legal title to the land) and substantial residential population of laborers. But other revisions, rather than attempting to make the document more useful or accurate, reflected the political priorities of higher administrative levels of CONAP. In one example that was explained with deep frustration in the meeting, a map that proposed different strategies or priorities for different zones of the park was eliminated from the document altogether, as CONAP would not allow visual representation of any zoning other than the simple legal delineation of the park.

One community located near the center of the park, Río Hermoso, was isolated as a "special case," and was the subject of recurring and conflicted discussion during the meeting. The settlement was known to have strong influence over others inside the park, to be deeply protected against eviction (through political connections and armed residents), and showed little interest in negotiating or otherwise working with park authorities. One of the study’s authors discussed the difficulty of this settlement, particularly the perceived difficulty of kicking them out: "it's a really controversial point, because what does it mean if we let them stay, and everybody there is narcos?" An NGO representative spoke up in support of dangerous compromise: "We know the landscape (el campo), we know the reality of these areas. The case of, for example, Río Hermoso, which is a big community. But in the end, if
they stay, they will be able to help get others to leave, and if we can keep them in a polygon where they don't move? Good! I think the proposal should be something like that. I know it's complicated to make it legal, I'm probably forgetting a lot of things, lawyers and all that... But that would be the best for the protected areas."

In this meeting, many questions remained unanswered and far more problems were discovered than solved. Even if CONAP succeeded in negotiating new agreements with settlements inside the park, what would be included in these agreements, and how much land would be granted to each community? Given the demographic structure inside these settlements, with large numbers of children per family, how would land parcels based on current households accommodate the anticipated "population bomb"? How would they deal with the inevitable social conflicts and violence that would erupt during the process within each community as they worked out the agreements ("they will kill each other amongst themselves," one man said), given that these would re-distribute and equalize land holdings by parceling out standard tracts of land to each family or household, as in Paso Caballos? What to do with the many settlements just outside the boundaries of the park that were clearly using park land for hunting, grazing, agriculture, or extraction of timber and non-timber resources?

Despite the inability to agree on strategy, let alone implement one, at least these problems were being taken seriously, the differences between narcos and poor campesinos acknowledged, a multiplicity of responses emerging in theory, if not yet in practice. Of course, as the afternoon wore on, the felt insurmountability of these
challenges grew, and the meeting eventually devolved into cynical jokes about buying up land in the park before the next government un-declared it altogether. The lines between conservation success and failure were drawn not only along the edge of "the shield," but in time as well – how long could any conservation hold in such a place? How long until the whole reserve had failed?

Fire II: An End to Forests

"Wake up and burn nature, that's what I like to do," one conservationist declared to me bitterly as we flew over a smoldering patch of land in the western Multiple Use Zone. The threat from the west materializes as fire, licking its way, year after year, across the landscape. When mapped, this pattern can look like a single slow-moving fire, spreading steadily over the years out from settlements and along old oil or logging roads. These cumulative images collapse many fires into a single destructive force: agricultural field or cattle ranch, lit by drug runner or poor peasant, legal or illegal, practical or vicious, all become part of a unified fire-threat, smoldering its way towards the still-maintained heart of forest cover in the reserve (figures 4.4 and 4.5).

Because of the centrality of this threat to all conservation practice in the reserve, fires were chosen as CEMEC's test run for a new Flash-animated mapping program designed for website presentation. MODIS hot spot data from 2001-2010 was coded according to which part of the reserve it was in, and then built into a dynamic map with a sliding time scale for easy comparison of fire intensity across the
jurisdictional spaces and years of the reserve (available on the State of the Maya Biosphere Reserve website here). This new way of viewing old data opened up discoveries in the computer lab, further solidifying the image of a threat from the west. Those viewing the new animated map had previously assumed that the buffer zone, an essentially unregulated agricultural and ranching landscape, would

Figure 4.4 A map showing NASA MODIS hot spots detected in and around the multiple use zone from 2001-2008. Controlled agricultural fires within the multiple use zone (outlined in yellow) can be permitted, but here the presentation of all fires as part of a unified threat is clear. This image circulates as a piece of evidence against community concession management in a controversy over the Mirador archaeological site, further described in Chapter 6. (Image source: Global Heritage Fund 2012).

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32 To view hot spots density (rather than total number detected in each zone), click on "PC Normalizado" on the online map. The current default settings for this online map differ from the version discussed here, making it less obvious that Laguna del Tigre had more fires than the buffer zone in several years. This is due to display settings rather than different data, which can be adjusted online if desired. The original data is embedded in the map for examination as well.
consistently show the highest fire rates. But the yearly slider clearly showed that in 2005, and every year from 2007-2010, fires were in fact more common in Laguna del Tigre. A new program for visualizing old data re-intensified the existing sense of threat.

But this threat is not unified, and the effects of fire are not even across the landscape. A patch of forest will be more or less affected by fire depending on whether or not it has burned before, and how long it has had to recover. The swampy bamboo groves in the North of Laguna del Tigre might burn 10, 11 times, year after year, and still bounce back, barely affected. But set just one fire on the steep thin-soiled slopes of the Sierra del Lacondón hills, and the land will be devastated for years to come (Ramos, personal comment). Agricultural fires, at least in communities...
with established relations with CONAP like Paso Caballos, are strictly regulated and controlled with fire breaks, restrictions on time of day and climatic conditions, and other management practices. Regulated communities are expected to control their own fires, calling on NGOs for resources and technical support, and on state institutions only in the event of a fire getting out of hand and crossing into primary forest. Other fires, of course, are set without these intense preventative measures, sometimes just to avoid the extra labor of control, other times deliberately for maximum damage and spread. When these are detected by satellite or field crews, they set CONAP's firefighting department in motion.

CONAP-Petén only has funding for two regular staff, plus the director Marco Gonzalez, in their fire department. In 2011, this two was increased to 13 by way of temporary, externally funded projects, but 13 is still a paltry number in comparison to how many bodies are needed to fight fires in the field. In the biggest fire of 2011, which took place in a community forest concession that had recently had its management contract revoked due to mismanagement and illegal land sales, over 250 men were called onto the front lines, and CONAP was forced to call on support from not just the usual SIPECIF (National Forest Fire Prevention and Control System), but also CONRED (the National Coordinator for Disaster Reduction), the Ministry of the Environment, DIPRONA police forces, and the Army.

If fire-fighting bodies are hard to come by, protective equipment is even more so. Funding to buy new equipment always lags behind the need, and old and out-of-date tools are used and reused long past their regulated lifetimes. The current
equipment used by teams in the reserve is extremely basic, especially in comparison to US, from which specialized training materials often arrive, mismatched to the realities of Guatemalan practice. Even when equipment it is available, many men on the frontlines will refuse to wear it, claiming it is too heavy, too hot, or too hard to move in. Gonzalez was frustrated with this dynamic given the amount of time and energy he put into securing funding for and buying the equipment, and then holding specialized trainings so the men would know how to use it. The advantage of hiring Peteneros, he said, was that many of these men had years of “empirical experience” working in the field as firefighters. But this sedimented field experience was sometimes a barrier to using new techniques taught in formal trainings. Getting men to wear helmets was among his biggest frustrations. He told me of a visiting gringo who told a story about a helmet he had seen in a firefighting museum in the US, with an enormous dent and a heroic tale of how the helmet had saved a firefighter’s life. But the men here, Gonzalez continued, they’re too cocky, fearless (bravo).

Firefighting in the Petén is rarely framed as the brave defense of nature or noble sacrifice that you might hear among wildfire fighters in the Western United States. Machismo and bravado enter the tales, certainly, but as a demonstration of personal trial, survival, and ability, not a selfless sacrifice in the name of the forest. Firefighting is work. Hard work, hot work, dangerous work, paid work.
CHAPTER FOUR: Fire at the Edge of the Forest

**Edge II: War/Peace**

If this chapter traces edges, the signing of the 1996 Peace Accords marks an important historical one. Legally speaking, the moment marks the difference between 36 years of civil war and military-dominated dictatorships, on the one hand, and a constitutionally defined representative democracy, bringing with it land reform and protections for indigenous groups, on the other. Legally speaking. As Diane Nelson notes, there is more than one post-war in Guatemala, a multiplicity of edges that fold back over themselves in processes of healing, restitution, and lack thereof (Nelson 2009). But the passage of the Accords into the heart of Guatemalan government structures stands as the major historical monument to this transition, even with their hugely contradictory effects still reverberating through the Petén.

The accords allowed refugees, including 46,000 who crossed the border into Mexico, to return and legally claim land, much of it in the Petén — a process that began in the early 1990s but was formalized by the new constitution (Egan 1999). Some of these refugees fled directly from southern departments of Guatemala, but many had previously been part of the colonization of Petén, returning to find their former FYDEP settlements now inside protected areas, especially Sierra del Lacondón and Laguna del Tigre National Parks. In addition to the arrival of conservation, many of the settlements abandoned by refugees had been inhabited by other migrants, who were encouraged to suspect returning refugees as guerilla sympathizers who might bring military attention and action down anew (particularly those who returned in the early 1990s before the accords) (Egan 1999). The poor soils
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of the Petén, requiring 3-5 years of fallow to return to agricultural productivity after 1 or 2 years of cultivation, meant that not only did returners need land, they needed a lot of it — between 7.5-45 ha per family (Egan 1999).

The experiences of refugees in Mexico with NGOs, UN agencies, and Mexican government support programs gave them greater access to health, education, and other key services, but these supports never included land. For this reason, many worked hard to find ways to return to Guatemala, despite its many disadvantages (Egan 1999). Their experiences across the border also transformed refugee communities, arming them with new knowledge and skills for organizing within their communities, gaining access to institutions and services, and buffering them from some of the brutal psychosocial effects of the war. When they returned, then, these refugees who settled in the Petén were able to garner much greater attention and support from NGOs, due to access to education and organization in Mexico (Carr 2006). Those who came back before 1996, too, were able to resist the last vestiges of recruitment into the military's civil patrols:

One can look at return communities as small islands of resistance in the sea of militarization which was rural Guatemala. Within the Ixcán and west Petén, the return communities were relatively large, well organized, and based on relatively democratic principles. Return communities refused to participate in Civil Patrols, something most other rural communities did not dare to do. (Egan 1999: 9).
Those who stayed behind in Guatemala were almost certainly witness to, victims of, or forced participants in state violence, and the channeling of development funding to those who fled led to serious resentment and conflict between communities in the late 1990s and early 2000s.

Paso Caballos was not a return community, but formed in the early 1990s in the ruins of a former Petenero settlement that had been abandoned during the height of the war’s violence. One Petenero NGO worker, Vincent, spoke to me of the time he first came to Paso Caballos — over 30 years ago, when he was working in the petroleum industry, and the world of conservation hadn’t yet reached the Petén. Back then, Paso Caballos was a Ladino town, a petroleum and forest resource extraction center with no access roads but an airstrip used to shuttle in people and supplies. The town was “much better then,” Vincent told me, with infrastructure for power and water paid for by the oil industry that the town in its current incarnation doesn’t dream of. It is unclear whether the town was harboring guerillas, leftist sympathizers, or was simply in the wrong place at the wrong time, but one day in the late 1970s warnings drifted in that the military would be coming to raze the town in three days. By the time they arrived, Vincent recounted, the entire population had disappeared, and never returned.

A group of Q’eqchi’ migrants found the spot sometime in the early 1990s, and brought their families on a long swampy trek to this little spot on the San Pedro river to found the indigenous community that occupies the location today. The shell of the previous town is still visible in a few places in Paso Caballos. A large water tank by
the airstrip blew down in a storm, the wooden tower supporting it slowly picked apart and hauled off for reuse. The landing strip itself is grown over with thick weeds and grasses, and the forest is encroaching from all sides onto the previously barren stretch, reclaiming the abandoned land of industry. The burned out husk of half an airplane lies in a stream nearby, the remnants of a failed drug transport landing, a tilted wooden bridge built over top of it to discourage curious boys from playing in the rusted metal. Paso Caballos was colonized, emptied, ruined, and resettled in less than 30 years, leaving scars etched into the land on this little spot at the source of the Rio San Pedro.

When asked why they settled here, in this place as opposed to so many others in the Petén, the answer of Paso Caballos residents is unanimous: water. While the headwaters of the Rio San Pedro are too full of salts and minerals to be potable, the river allows for fishing, transportation, washing, and cool swimming (despite the occasional presence of crocodiles), immeasurable advantages in a landscape characterized by very few water sources and a long, hot dry season. But the water, which has never been drinkable, is now unsafe for even washing and swimming — though the village still uses it for these activities. The lack of proper infrastructure in the village and haphazard, poorly maintained toilet facilities (often no more than shallow pits in backyards), have led to major contamination of the slow-moving headwaters. Along with frequent exposure to malaria, dengue, and other tropical diseases and lack of access to medical care, continued use of this water is a major factor in poor health throughout the community.
The transition from war to peace also brought the rise of human rights discourses and movements in Guatemala, led largely by MINUGUA (United Nations Verification Mission in Guatemala) and other UN officials overseeing the transition and highlighted by the awarding of the 1992 Nobel Peace Prize to Indigenous and human rights activist Rigoberta Menchú. Human rights, including cultural and political rights for indigenous groups, are explicitly recognized in the Peace Accords and new constitution. And in Guatemala, as around the world, human rights have come into conflict with conservation, particularly as people are evicted from strict protected areas like the Maya Biosphere Reserve’s western Parks (West et al. 2006; Adams et al. 2004; Agrawal and Redford 2009). If evicting people from parks is the default reaction to their presence — legally, if not always in practice — then those being evicted have been given a new set of discourses and allies in Guatemala, constitutionally instituted by the accords. As one NGO worker noted of human rights observers: “they just talk to those people who represent themselves as victims, and... ok. But they don't see both sides of the thing, so they come out in support for these people, and it's difficult.” Human rights violations have occurred in the Maya Biosphere Reserve in the name of conservation (Ybarra 2012). But those working in the field insist that many settlers strategically take up this language to claim rights that they do not legally have, such as the right to buy and sell land inside the reserve, to newly invade protected lands, or to raise cattle.

In August 2011, an interview with Alberto Brunori, representative of the UN High Commissioner for Human Rights in Guatemala, was published in the national
newspaper *Prensa Libre* (Valdez 2011). The article, which focused on the human rights situation of settlements living in protected areas in the Petén, set off a rash of email exchanges and conversations in the back room of WCS. The reactions ranged from a considered “this will make things a little bit difficult” to a deeply sarcastic “the poor campesinos without rights…” to “well, that’s their [the human rights commissioner’s] job.” One man pointed out the citation of a 2004 MINUGUA report in the interview, which had predicted the development of many current problems and dynamics, but whose recommendations were never followed. The man continued:

> I was there back in 2004. I remember when MINUGUA was preparing that report, and I went down to the capital to talk to them. Because in their report on land conflicts in the Petén, they were talking about all these factors: historical cattle ranching development, the movement of different ethnicities, the impacts of the war. But in all of that, they didn't have anything to say about what I saw as a major factor: organized crime. So I went down there and talked to them, showed them a bunch of evidence of what we knew was happening. And I said to them, ok, so we're not these violators of human rights — they had been seeing things about burning people's houses and that kind of thing — but we do find ourselves clashing with these people, these populations, just based on our work and where they are.

Another incredulously paraphrased a selection from Brunori's *Prensa* interview: “they say that the involvement of the military in the fight against organized crime and
The comment was met with derisive, resigned laughter.

Current Attorney General Claudia Paz y Paz, appointed in 2010, has a background in human rights law, and has been a boon to the prosecution of rights violations in the country, including several high profile cases against military and political leaders from the civil war. Early in her tenure, she declared her staunch opposition to evictions in the Maya Biosphere Reserve, citing human rights concerns. According to one conservationist, this position resulted from a meeting that Paz had held with leaders from communities within Laguna del Tigre, facilitated by a campesino rights organization and with an invited UN representative. When Mariela Lopez, director of CONAP-Peten, eventually met with the Attorney General to discuss prosecution of environmental crimes in the reserve, Paz reportedly told her, “I have your name here as a violator of human rights.”

Despite this rough beginning, Paz continued to meet with Lopez and other conservationists to discuss gobernabilidad problems within the reserve, and, in mid-2011, took a helicopter tour of the western areas of the reserve, guided by Lopez. An NGO leader also present told me the tour was designed to demonstrate that not all people living in parks were poor campesinos:

33 The paraphrased selection originally reads: “the military has no business working in public security. The experience of combating organized crime with military forces, as can easily be seen in neighboring and distant countries, does not lead to results. Results can be achieved with a good PNC [National Civil Police], excellent coordination with the MP [Ministerio Publico, Attorney General’s office] and a civil intelligence that does its work” (Valdez 2011; my translation).
It's amazing how this human rights stuff is manipulated, it's really terrible. I mean, who's against human rights? But [Paz] came up here and took this flight with us, so at least now she's seen the other side of the coin. We flew over the big fincas, the communities that are maintaining the airstrips... so we just have to wait and see how it'll turn out, I guess.

While Paz never moved to full support for evicting settlements, she did begin to work more closely with conservationists in the Petén as the year went on, particularly in the development of the Environmental Justice Forum. Another NGO leader involved in the development of the Forum told me, in regards to a few major cases that the forum was preparing with Paz’s support against land invasions: “if there is any convergence between an honest human rights agenda and an honest environmental agenda — and let’s face it, both of these are easily corrupted by other interests — this is it. The concentration of state lands in the hands of the wealthy few.” He saw the roots of this problem in the inaction in the face of earlier park invasions, inaction that was legitimately motivated by protection of human rights. Right after the Accords, he told me, CONAP had to decide to either create agreements with the settlements inside Sierra del Lacondón and Laguna del Tigre and try to work things out, or to send in the army to kick them out. While he supported their choice, (“right after signing these historic Peace Accords, to send in the army, how would that look?”), he also saw this historical reticence as the origin of current problems with land grabs in the reserve.
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Fire III: Scorched Earth

This historical view recalls yet another kind of fire: that used extensively as an anti-insurgency weapon during the war, alongside torture, rape, massacre, kidnappings, disappearances, and other horrific forms of violence. Fire extended the military's genocidal brutality from (primarily indigenous) people to their crops, animals, and homes. By the end of the war, 626 rural massacres had been carried out and over 400 villages burned to the ground (Ybarra 2012). These counterinsurgency campaigns operated at the scale of landscapes rather than targeting rebels, because of the shifting, hidden nature of guerilla warfare:

The state, with its warlike tactics undermined by such a moving target, attacks not the guerrillas but the population and the terrain. Massacres, scorched earth, displacement, defoliants, and resettlement are ways to control, monitor, reorganize, and redeploy insurgent networks and forces. If, as Mao Tse-Tung said, guerrillas move among the population like fish in water, Guatemalan counterinsurgency strategy, especially from 1978 to 1983, was to remove the water from the fish, to transform the milieu. (Nelson 2005: 220).

The Guatemalan army used this same metaphor to justify its actions at the time, aiming to “drain the sea” of civilian support for the guerilla movement (Jonas 2012).

Villages in the Petén were subject to some of the most extreme violence, including burning, in the country — housing, humans, fields, livestock, all went up in smoke (Egan 1999; Ybarra 2012). The region was targeted because its thick jungles were particularly welcoming waters for revolutionary fish, provided hiding places for
many leftist rebels. In addition, the unruly agricultural frontier confused categories of people, place, and politics, confusions that the scorched earth campaign aimed to clarify:

First, following the coup that quashed agrarian reform, the militarized government actively encouraged colonization of the northern lowlands. Small insurgent groups that represented a threat to the militarized state tended to base themselves in the jungle. In response to this, the military’s counterinsurgency campaign sought to tame the subversive jungle. The jungle as a guerrilla refuge deepened the military’s perceived need for army control of the jungle and a territorial strategy to separate nature from civilization/agriculture. (Ybarra 2012: 489).

Rather than settling and securing the landscape, however, this tactic resulted in an intensification of the already temporary and moveable nature of settlements in the Petén, as entire villages would empty of people if the military was known to be approaching, including the former inhabitants of Paso Caballos (Egan 1999).

**Edge III: Conservation/Development**

What are the boundaries of acceptable conservation practice? Should a conservation NGO be doing development work? “A philosophical question,” as WCS director Roan Balas McNab put it, reworking the boundaries of conservation again and again with me and with others: If there are people living inside a National Park, where they have invaded illegally, do you help them gain access to water, education,
health services, and try to restrict them from cutting deeper into the forest in exchange? Or does this signal that invasions are a legitimate and successful path to gaining access to land, opening the door for future problems? Roan reflected:

What it comes down to, for me, is that we're here ultimately to work for nature. So which is better for nature, for those beings without voices or votes, that's the ultimate question. And how do you work with those communities to save what you can while also making sure that the conditions are right so that it isn't easy for others to do that, invade, in other parts of the reserve? These are the kinds of tough questions I grapple with all the time.

Roan's shifting back and forth on these issues mirrored the way that global conservationist discourses and strategies have shifted back and forth over the past few decades, from strict nature protectionism to integrated conservation and development in the 1990s (Adams et al. 2004; Howard et al. 2007), and then back again in the early 2000s (Brechin et al. 2002; Bray and Anderson 2005; Brosius and Russell 2003).

While WCS' director struggles philosophically with these issues, his field technician Rosa works on development projects in Paso Caballos. Through their 1997 agreement with CONAP and their newer two-year Acuerdo de Conservación signed with WCS and other institutions, Q'eqchi’ villagers trade participation in conservation activities for development assistance: money for the school, seasonal jobs, a village health outpost started and failed and started and failed and started and failed. When I ask Rosa why health projects never last here, she replies: "the people don’t want it.” When I ask why the school buildings are so run down, the construction on a new
addition unfinished for years: "the people don’t want it.” Her statements about the village get confused in the lines between conservation and development, contradict themselves. First, *I’m here to support the community, to do what they want. If they don’t want something, that’s their choice. I can’t do anything about it.* And then, *I’m here as the representative of a conservation organization. It doesn’t matter what I think is right, I have to prioritize conservation.*

There are two possible futures for Paso Caballos, Rosa told me. Either people will start invading the forests around the village, or… she trailed off, failing to provide her alternative future. "The soils are already becoming exhausted," she said instead. "With this many people and agriculture this intensive, it can’t continue."

There were many things about the village that she still didn’t understand after four years working there. In fact, she told me, she felt like she hardly understood the village at all. Still, she told me that the village was her favorite place that she had worked because people put up with things that she couldn't get away with elsewhere – silly things, like yelling out at people while she walked around the village, giving joking answers to questions that weren't addressed to her, loudly inserting herself into conversations where she didn't belong. “*Pueblo chiquito, infierno grande*” (small village, big hell), she says, explaining: everybody knows everybody’s business, is involved in everything. And then, contradicting herself again, Rosa insisted that she didn't stick her nose where it doesn't belong, "I don’t get involved in other people’s problems."
Sometimes, of course, she simply can't get involved, excluded by the tightly protected linguistic separation of the Q'eqchi' villagers. In their meetings with state and NGO institutions, the people of Paso Caballos frequently slip into Q’eqchi’ Mayan to hold private conversations in the shared meeting space, deciding on a course of action or response before switching back into Spanish to address the outsiders again. This is a powerful tool, and one which the villagers protect vigilantly: when it was discovered that an NGO staff person was fluent in a similar Mayan language and able to understand a good deal of their conversations, they began asking him to leave the room while they held their discussions in front of the rest of the visitors. That these villagers take this code switching for granted, and do not leave the room themselves, is indicative that the power relations in these encounters are not straightforward. Outsiders — CONAP, NGOs, and others — have many structural advantages, but are repeatedly frustrated by their inability to impose whatever new programs or rules they like on the marginalized migrant community.

This linguistic shield also meant that the community, largely reticent to speak with me one-on-one, welcomed me openly into their general community assembly meeting where they hashed out highly contentious issues. An easy invitation, since they knew I could not understand their conversation. I listened as best I could, occasionally posing questions to Manuel, a villager who had been my translator during my Master's research in Paso Caballos in 2007:

I ask Manuel what they are discussing, and it turns out they have jumped right into the fire season plan and who will be named the promotores [fire
regulation promoters, seasonal jobs paid by WCS through the Conservation Agreement. The discussion starts out involved and attentive, but relatively calm: people take turns, Geraldo [auxiliary mayor, head of the COCODE] speaking between the others and moderating the proceedings. Their speech is peppered with Spanish connecting words relating to life inside the reserve and the work of fire management: *brecha, ronda* (words for fire breaks), *sopladora* (leafblower), *instituciones* (institutions), *Rosa, Acuerdo* (conservation agreement).

As the meeting proceeds, it gets more and more animated, until people are gesturing wildly, standing to yell their opinions over each other, and finally the whole room erupts in people shouting over and at each other. Even those who aren’t speaking up are clearly engaged, and while there are maybe 10–15 men who speak the most, many throw in an opinion or two. No women speak, though they are listening. At the end of the discussion, agreement or consensus is reached, and Geraldo runs through what seems like a summary of their final position. The assembly responds with a chorus of ‘*oos*’ (‘good’ in Q’eqchi’), then moves on to discussion of a failed satellite internet project. When the meeting is over, I learn that the assembly decided to reject the entirety of the NGO and state-proposed seasonal fire plan. When I ask Geraldo why, he responds simply: It’s because these institutions always offer support, and never follow through.
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This rejection resulted from the way the boundary of acceptable conservation practice (or development practice that is acceptably conservationist) is sometimes drawn around a who, not a what. Only those villagers included in the 1997 signed agreement between Paso Caballos and CONAP and their direct descendents are eligible for WCS-paid seasonal work as fire management promoters. The village assembly's uproar concluded in rejection of this condition, selecting two men who arrived after 1997 as their choice for the jobs and with this choice rejecting an entire inter-institutional fire season plan, which had been laboriously hashed out in a meeting with the COCODE a few days prior. How to move forward?

Fire IV: Burning down the house

Setting fires to houses is more than just a tool of oppression and scorched earth military terror. Those without an army, too, can light a match. Like back burning to fight a wildfire, these smaller fires burn in opposition to whole villages lit by the powerful. Park guard houses, state-run control posts, NGO village-residence huts, biological research stations, all of these have burned in the Maya Biosphere Reserve, set alight by the poor, the angry, the dispossessed. Terrifically violent yet potentially subtle, the burning of institutional structures in the reserve has served as a regular punctuation to the slow spread of state (and state-like) territorial control. And in many cases, something new has risen, phoenix-like, from the ashes — new buildings replace the old, transformed in both material and social relations.
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Even CEMEC, its office outside the boundaries of the reserve, has been threatened by this kind of fire. Between 2002-2009, the lab relocated away from CONAP’s San Benito office to Flores, occupying office next door to WCS. As David recounted to me, the move was motivated by the threat of counter-flames after the civil war:

In the year 2000, we were here in this [CONAP] office. And then in 2000, President Portillo started here in Guatemala. And there were a lot of people who started to say that those who were in the war, that the government had to give them money. Those who had been part of the Civil Patrols — they were civilians who supported the military, the Autodefensa Civil. So, there were some leaders who started to say that the government has to pay them, the Patrollers, and if not they were going to burn down the public institutions. So in that time … CEMEC left CONAP for Flores.

The forced participation of Guatemala’s people in civil war, turning communities against themselves, came back in this threat of fire, putting the state on the run. CEMEC, in its hybrid nature, had WCS to run to; the NGO paid (at least initially) for the rent of the Flores office. But in 2009, a new director of CONAP-Petén began to resent the power relationship implied by CEMEC’s continued location with the NGO rather than in a state office, and moved the computer lab back in. And by the time I arrived in 2011, threats against state institutions in the Petén were coming from narcotrafficking gangs, not former civilian soldiers, bomb threats instead of fire.
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This use of fire is more widespread than these former military collaborators, however. Rosa used to work in Uaxactún rather than Paso Caballos, but quit WCS for two years in between these assignments when her house in the first village was burned down. WCS has maintained a semi-residential presence in Uaxactún since 1996, building small houses for their staff to live and work in. Built first in the local style of wood houses with thatch roofs — cheaper, and both cooler in the intense heat and warmer on the rare chilly day — these houses proved too flammable for the institution’s inclination towards permanence. One by one, these houses were burned down. Loss of an NGO-paid job. General disapproval of outsiders. Project failures. Alcohol. Personal vendettas. One by one, the buildings were built again, this time with heavy concrete bricks and corrugated tin rooftops that trap the dense heat of the midday air, but successfully keep out even hotter flames. The institution rebuilt, replaced, and remained. Rosa left Uaxactún in frustration but eventually came back to WCS, and began to work in Paso Caballos instead.

But the roots of the Q'eqchi’ village's stability inside Laguna del Tigre are also awash in flames. Like shoots of maize in a milpa field rising from the ashes of burned forest, Paso Caballos’ agreement with CONAP grew from the ashes of the first Scarlet Macaw Biological Station, constructed less than 6km down river from the village in 1996. When the first group of Q’eqchi’ migrants settled here at the headwaters of the Rio San Pedro in the early 1990s, there was no park presence, only water, land, and the ghosted ruins of a former oil extraction camp, abandoned during the civil war. CONAP arrived a few years later, along with NGOs including
Conservation International’s Guatemalan offshoot, ProPetén, which undertook construction of a new biological research station just inside the eastern limits of the Park. As the NGO built its station, CONAP began the work of evicting now well-established communities from the park. Stories from this time sometimes say that CONAP was burning down people’s houses to make them leave, but whether or not the state indeed revisited this scorched earth tactic is uncertain. What is certain is the fear that people felt in Paso Caballos, fear that this land they had finally found after long processes of dispossession and displacement might again be wrested away (Grandia 2012).

So they burned. Villagers from Paso Caballos and other migrant villages combined forces, heading for the station in small boats along the Rio San Pedro, kidnapping NGO staff for several days, and burning the brand new buildings to the ground. The hostages were released, alive but not unharmed, after ProPetén’s leader, Carlos Soza Manzanero, negotiated a settlement between park and people: the villages would be granted conditional usufruct agreements inside the park, and in exchange would contribute to the rebuilding of the station. This tale has now circulated widely, with striking variation, illustrating in different contexts the failures of conservation (Parks Watch 2003; Grandia 2012), the duping of Q’eqchi’ villagers by other interests who "paid for and orchestrated" the burning (Bray and Anderson 2005), the heroic character of Soza (Nations 2006), or the essential role of community-level participation in environmental development (Grandia 2012; Sader et al. 1997).
I had therefore read the tale of the burning several times before my first trip to the Petén in 2007, for my Master’s research on the relationship between Paso Caballos and the Biological Station. During that trip, I asked everyone I met to tell me the story, and collected as many mentions and versions as I could. I heard the stories of three people who were kidnapped and held hostage, those of a few who lived in Paso Caballos at the time, and more who have since moved to the area or otherwise heard the story secondhand. I have also continued to collect published accounts or mentions of the event, however brief, some of which purport to represent the perspectives of (some of) the attackers themselves (Grandia 2012), a perspective that no one I spoke to claimed directly. The variation in these stories is significant, pointing again to the fact that more than a simple difference of perspectives, this event was a conflict between different realities, and a reminder that when contradictory realities come into contact in Petén, the differences might erupt into flames.

One of the most complete versions of the story I heard over the summer of 2007 came from my friend Byron, a worker at the Biological Station who had been kidnapped, who performed the tale for me as he swept out the Station’s dormitory rooms, using the broom to gesture wildly and act out the dramatic scenes. Like many, Byron began his version with a familiar standard opening, one that indicates a clear beginning to a story that might otherwise reach back much farther into local and national histories: the trouble began in 1996, he told me, when ProPetén built its new...
biological station. Bringing the broom down from where he was sweeping cobwebs out of dark ceiling corners, Byron leaned on the long wooden handle and set a scene of confusion: it was November, and after working on construction for nearly a year they were on the verge of inaugurating the station. The scene Byron set was one of confusion. From where he was working atop a bodega (storehouse) roof, he could see down to the river, where a tangle of motorboats were coming and going — workers from the station off in one boat to get drinking water, other boats filled with local fishermen fishing, and others simply part of the river traffic that snaked along the San Pedro, moving back and forth between the more than 20 illegal villages that had been established inside the park. “All of a sudden a boat full of men with machetes, with pistols, with guns. . . They started running up towards us with their weapons.”

Perhaps it was bravado in front of his gringa secretary, but Byron claims that at this point he turned to the manager of the station and cracked a joke: “It looks like we have some visitors… but how odd!”

Byron continued, his story weaving people’s motivation for violence with the actions themselves:

They came because CONAP had been burning their houses, and they were angry. But we weren’t burning their houses. They thought that it was us [ProPetén], that we were burning, but we didn’t have that authority. We didn’t have anything to do with it. So they came running up at us, yelling ‘hands up!’ And what could we do? We didn’t have guns, or anything more than machetes to defend ourselves. We couldn’t run, they said they would shoot us in the
back. But we didn’t know anything about the burning. We couldn’t do anything.

The attackers — I have heard estimates ranging from 15 to 450, the most reliable probably around 60 — came running up from the river, kicking in doors, smashing and breaking everything they could find, and finally using the station’s own stores of gasoline to set fire to the brand new buildings and equipment. 13 workers were forced into motorboats, their legs and arms tied together and to each others’ captive limbs. “We didn’t know they were burning until we were out in the boat and felt the incredible heat of the fire.” Bound and surrounded by gun-wielding men threatening to kill them, the ProPetén workers were carried downriver to near the Mexican border, where they were held hostage for two nights. The fire demolished every last shred of the biological station, as well as much of the surrounding forest, before it was brought under control.

According to Byron, ProPetén did not find out that they had been kidnapped for two days. Although the kidnappers’ guns were never used, the hostages were beaten and threatened continually. Byron described how the station’s manager, because he was ‘boss,’ took the worst of it, getting kicked in the stomach. The men also used the broad sides of their machetes to — thwack! — slap the hostages across the back. The manager later told me that he was so physically and psychologically traumatized by the experience that he could not return to work for a year, and his eyes still welled with tears when he told the story. Pausing his tale, Byron returned to his
sweeping and fell into silence for a few minutes, then looked up at me, “you know? We were a little bit nervous.”

Enter the hero. “But then ProPetén — back then, the boss was Carlos Soza — he came and sorted everything out.” Soza, a Petenero and director of ProPetén for its first ten years until his death from illness in 2002, has acquired a gilded sheen in the memories of ProPetén workers, especially those I met at the Biological Station in 2007. Bridging a deep passion for conservation, a local feeling for the forest, and an unusual sensitivity for the plight of poor migrants, Soza deftly coordinated between a number of different groups to start negotiations with the attackers, leading to the formal agreements between CONAP and the communities (including Paso Caballos) that would allow them to stay within the park. His entrance into Byron's story brings it to an abrupt end, much like prince charming riding in at just the right moment, followed closely by a happily-ever-after. “He made the agreement with the communities, and they all followed it… And up to now we’re all friends, everything is fine, there haven’t been more problems. Todo tranquilo (everything quiet).” After this incident, people “learned the difference” between CONAP and ProPetén, but the NGO’s work in the village dwindled over time, and in 2010 the organization sold the Scarlet Macaw Biological Station to Asociación Balám, the Guatemalan NGO started by WCS.

Other versions of this tale, including that told to me by anthropologist and social historian of the Petén, Norman Schwartz, emphasized the material transformation of the station itself: the construction materials and architectural design
of the station were entirely different when rebuilt, providing a material analogue to the transformation of relations between park and people. The original buildings, according to Schwartz, resembled “pillboxes” or “bunkers.” “When you make sudden moves,” he explained, "you’re likely to confuse and upset people. So the combination of the way the station looked combined with the suddenness of its arrival really freaked people out.” The reconstruction effort, led by Soza, redesigned the station’s buildings according to the local style, with wood from the station’s forests, screened but largely open walls, and thatch roofs. This transformation is described as a ‘localization’ of the station’s design, and carries an implied shift of decision making power from CI to ProPetén — though the latter was not yet independent. As such, the material reemergence of the station is told as a triumphant process, providing an allegorical parallel to the emergence of locally-negotiated agreements standing against National law and international conservationist priorities.

Finally, though in several published accounts Paso Caballos is named as one of two communities that led the attack (Parks Watch 2003; Grandia 2012), people in the village usually denied knowledge that this burning ever happened or displaced the action onto others. One villager, Don Pablo, focused his version of the story on the essential differences between Q’eqchi’ and Ladino migrants to the Petén. When I asked about the burning, the first words he spoke were those of ethnic differentiation: “it was castellanos [Spanish-speakers] who burned the station.” While Don Pablo never talked about the Q’eqchi’ with words like oppression, marginalization, or unfair treatment, his fear and resentment of Ladino culture was evident. Ladinos, he would
tell me, are *mala gente*, bad people: “when they get mad, they do whatever they
want.” Today, people from both the village and the station talk about the lawlessness
*abajo*, downriver towards the West and the Mexican border. The burning of the
station was blamed on communities from abajo in almost all the stories I collected in
2007, a shift in historical attribution that reflects the current distribution of threat and
fear while quietly covering over the village’s own conflict-ridden past.

The closest that any in Paso Caballos came to acknowledging responsibility
for burning the station to me was by emphasizing their misunderstanding of NGOs vs
the state: we didn’t know that CONAP and ProPetén were different things, they
repeated. Now we have learned what conservation is, now we know better. Still, even
if the attackers had confused ProPetén and its research station with the state's park
authority, Don Pablo pointed out that “CONAP stuck their foot in it. They also
wanted to kill the people.” When the station burned, Don Pablo told me, they were
scared in Paso Caballos, too. The villagers saw the smoke and thought CONAP was
coming to burn their houses; people were ready to flee. One woman told me the story
as one of fear for her own home and life. It wasn't a tale about who burned the station
or why, the agreement with CONAP, or ProPetén. Instead, it was simply her own
memory of the time, filled with fear, confusion and fire:

> When the station burned, we were all scared that our houses would burn next,
that there would be a huge forest fire and that all of our houses and clothing
would burn. In order to prepare, we put all of our clothing into big *costales*
[containers used to store corn]. Everybody got together and put their clothing
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into these costales so it wouldn’t burn. We were scared of the fire, and scared because there were so many boats coming in and out all of a sudden, and helicopters flying over, and we thought the fire was coming.

People from Paso Caballos, along with others from other migrant villages, started this fire. But once a fire is lit, it belongs to no one.

Edge IV: The Fire Break, or Forest/Farm

There are metaphorical edges, like those I have been tracing, and then there are physical ones. This is the brecha, the fire break that cuts a line, 5-6m wide in most places, through the jungle around the outer limits of Paso Caballos’ agreed upon territorial polygon (poligono agricola). Fire breaks cut mapped boundaries into living vegetation, a delimitation of nature (forest) from culture (agriculture) made manifest by chainsaws, machetes, and leaf blowers. There are smaller brechas, too, cut around individual patches of farm land to be burned; these might cut lines within an individual's parcel but always clear the mapped boundaries between them, such that the landscape begins to look just like the map designating Paso Caballos’ use rights, included in their orginal agreement with CONAP (figure 4.6).

At a February, 2011, meeting in the village to plan the upcoming fire season, these brechas were divided into three categories, differing in priority and who would take responsibility for their maintenance: 1) the western external border with land managed by Asociación Balam’s Scarlet Macaw Biological Station, 2) the Northern
CHAPTER FOUR: Fire at the Edge of the Forest

border marking the edge of Laguna del Tigre National Park with the Multiple Use Zone, in particular a community forest concession belonging to AFISAP (Comprehensive Forestry Association of San Andrés, Petén), and 3) the Eastern border and internal brechas between individual agricultural parcels. The meeting, given an unwieldy formal title, “Activity Planning for the Prevention of Forest Fires in the Sector of the Paso Caballos Zone and its Areas of Influence,” involved two representatives from WCS (including Rosa), the director of the biological station and

Figure 4.6 Map showing both external and internal brecha lines of Paso Caballos' *polígono Agrícola* (agricultural polygon), including a small communal forest reserve at the northern edge of the village's territory (ProPetén 2000). The three edges along the western side are shared with the Scarlet Macaw Biological Research Station, the northern edge with the AFISAP forest concession.
two additional Balam field staff, the CONAP director of Laguna del Tigre National Park, a representative from SE-CONRED/SIPECIF (national disaster reduction and forest fire agencies), two representatives from the AFISAP management board, and all current members of Paso Caballos’ COCODE.35

The first two sections of fire break were given the highest priority, based on the economic and other sanctions the community would face if fire passed from village land to either Biological Station or AFISAP territory. Starting with the Western brecha, two men from the COCODE explained that they had finished clearing the line in December, but the director of the biological station quickly objected, saying that he had recently walked 3km of the line on a patrol and that the break needed to be widened by at least 1m in order to ensure that even large fires could not pass. Responsibility for clearing that stretch of fire break was described by Rosa as 50/50 between the station and the village, but this assertion was met with confusion and disagreement — did this mean equal contributions of funding? Labour? Shared responsibility if a fire should pass? Eventually, the group decided that maintaining this break was not a truly equal collaboration or shared responsibility, because any fire that passed would be the community’s responsibility first and foremost. Instead, the station simply lent its support to this effort due to its direct interest in the protection the brecha offered.

35 One participant in the meeting expressed discomfort at the idea of it being recorded, although they were OK with me taking notes and pictures, so all quotes from this meeting are paraphrased.
In contrast, the second section of firebreak shared with AFISAP was considered a true collaboration, with the community concession offering clear coordination with Paso Caballos over which areas remain to be cleared. One of the men from San Andres reminisced about a fire that passed from Paso Caballos into AFISAP territory in 2009, offering this as an explanation for why the concession now found it useful and worthwhile to coordinate break clearing with the village. For both of these stretches of brecha, exact responsibilities and contributions of all the different institutions and actors present was broken down in the meeting — how many people each could commit, for how long and on which days, and how much gasoline, equipment, food, funding for equipment repair, and other resources each would contribute. The meeting was tense, with representatives of each institution and community pushing back on the others and looking out for their own interests. One institution offered packages of “expired food” (*comida vencida*), an offer met with derisive laughter from another participant: “do they think we’re children? That we want that?”

Finally, with the first two brecha sections mapped out and negotiated, Rosa noted that the third section would be dealt with last, as resources allowed, downloading the majority of this responsibility onto individual agricultural parcel holders. For all three categories, two "promoters" from the village would be chosen by the COCODE, paid from WCS funds through the recent Conservation Agreement, and given responsibility for contributing to brecha clearing, ensuring that other villagers cleared the edges of their own parcels (especially those along the western
and northern edges), and coordinating between state and NGO institutions and the rest of the community for all seasonal fire prevention and management activities. These activities included recently introduced measures like a colored flag system to indicate daily conditions and suitability for burning, a complete seasonal calendar scheduling different parcel burnings, and a required form to secure COCODE and institutional approval before starting any fires. This last requirement had been instituted somewhat haphazardly in the previous year, with perhaps 2/3 of fires registered by the forms.

The planning calendar was dropped entirely, despite being used in other communities successfully, because the COCODE insisted that people will only come to them 2 or 3 days before burning to fill out their forms and request permission (if at all). After a few hours of hammering out many minor details, the meeting ended calmly. Despite the tensions and occasional eruptions of conflict during the proceedings, Rosa told me afterwards that she was surprised by how smoothly it went.

This smooth sailing did not last long. Despite the fact that Rosa and others had made it clear that only villagers included in the 1997 CONAP agreement could be hired for the promoter positions, the COCODE chose two men classified by this document as “invaders” for the jobs. Two days later, when discussion over the COCODE’s choice and institutional restrictions broke out in the community assembly, it led to a rejection of all aspects of the settled fire plan. Villagers refused to sign off on the plan and to submit their authority of choice over hiring men from
within their own community.\textsuperscript{36} They expressed deep distrust in any promises made by institutions, and were particularly suspicious that the fire planning meeting had taken place with the COCODE only, such that the entire assembly was not present to hear representatives from the state and NGOs make promises to their faces.

The fallout was immediate. Rosa, back in Flores, caught wind that something had gone wrong, and started dialing through the cell phones numbers of anybody who might be in the village, trying to get a handle on the damage done and whether or not she was taking the blame for the plan’s failure. The men of the COCODE stood in the communal meeting hall where the assembly had just cleared out, face to face with CONAP and SIPECIF staff who were passing through again to check on the proceedings. Unlike the tense but restrained atmosphere of the meeting a few days earlier, this encounter felt like open conflict, a direct face off. The state representatives — all Ladinos — spoke loudly and authoritatively, standing taller and broader in their institutional uniforms over the leaner, shorter Q’eqchi’ men, dressed for the fields, who tended to listen quietly, or to interject even their deep disagreements with softer, more cautious voices.

The conversation hinged around promises of support (or lack thereof), particularly the question of buying gasoline for brecha clearing equipment. Each side insinuated that the others’ claims of poverty and lack of resources was disengenous.

\textsuperscript{36} This refusal, in addition to the reasons outlined above, was also about the act of signing a fire plan document. Entangled with a general distrust of institutional promises, one man explained to me that people refused to sign this document because they knew it would be taken by the institutions to other places (\textit{otro lado}) and used to secure further funding for them. In other words, signing documents served institutional interests, not community interests.
A park representative, Ronaldo, stated that CONAP had no money for fuel: “if I had that money, I’d just come give it to you.” One of the COCODE members responded, “what about your salary?” causing a round of quiet, nervous laughter. In turn, when Ronaldo stated that CONAP support was particularly difficult given the recent government transition, that sometimes staff didn’t get paid for months during transitions, and that his own position in park management was insecure, he turned to the Q’eqchi’ man standing next to him and asked, “and how many manzanas of land do you have?”

**Fire V: Agricultural Tool**

Fire is a key agricultural technology in the Petén, as in many parts of the tropical world. This form of agriculture — swidden, slash-and-burn, *milpa* (the maize-centric version familiar to Central America) — has been practiced in the region for millennia. While pyrophobic discourses and inflammatory images of poor people burning down primary rainforests still dominate many environmental imaginations, other responses are possible. Many argue that shifting agriculture, milpa or otherwise, is best practiced with low population densities and large extensions of land, allowing larger scales of time and space for the regeneration of forest growth between uses of the land (Dove 1983; Angelsen 1995; Lambin et al. 2001; Sillitoe 1996; Fox et al. 2000). From this perspective, it is the overcrowding of swidden-supporting forest landscapes — caused proximately by migration or population growth, and structurally by reconfigurations of land rights and access — which poses a problem, not the
agricultural method itself. These problems, not milpa itself, cause people to start cutting into the primary forest.

Of course, this analysis lends still itself to a distinction between the milpa of migrants — a rolling frontier putting pressure on the forest — and that of Peteneros, long accommodated to a local balance of field, fallow, and forest. Many sustain that migrants, especially the Q’eqchi’, have brought particular practices from other regions with them, such that they are now particularly ill-suited to their new environment (e.g. Nations 2001), although other research has shown that there are no substantial differences between indigenous or Ladino migrant or Petenero milpa practices (Atran et al. 1999). While environmentalists working in the region claim to see differences between ‘local, traditional’ swidden fields and those of indigenous migrants, these differences reflect conservationist perceptions of the bodies and histories of those lighting the fires, not the fires themselves.

Migrants themselves recognize ways that their agricultural practices have shifted and adjusted to the different climate and soils of their new landscape. Men in Paso Caballos were quick to tell me about these differences, the most favorable of which was the Petén’s hotter, wetter climate, allowing two consecutive maize plantings per year, sometimes even three, instead of the single one possible in Alta Verapaz, from where their families came. The varieties of corn you could grow were different, too, and some crops grew only here — rice, the spicy *chile Petenero* — or there — coffee, cardamom.
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In the relatively cool month of January, after the rains have slowed but before the heat sweeps in, people in Paso Caballos begin cutting their parcels in preparation for burning — chopping down trees, vines, overgrown agricultural residues, and whatever else may be growing, leaving it rough on the ground for a month or so to dry out. The next step — mandated and closely watched, though not always carried out to the letter — is to cut the fire break around your parcel, between 2-6m wide, depending on the height of the guamil (fallow, secondary vegetation) you cut, the botado (cut material) you now have, and the corresponding potential height of flames. As soon as the extreme heat of the dry season hits, usually in late February, burning begins. During the peak of the fire season in February, March, and April, daily temperatures regularly exceed 40C (104F) without a drop of rain, so the heat that people feel when the landscape lights up is incredible.

To light that fire, they must carefully cut and control the burn, accounting for wind direction, slope, and time of day so that their fire only burns their own patch of land (fires sometimes accidentally cross from one agricultural parcel to another, but nobody worried about this too much unless it got near the forest edge). The fires return tangled vegetation to the soil in a quick burst of essential nutrients. After burning, the land is left to rest. If it rained, there would be trouble — the lighter surface ash layer carried away in waste. But this is the dry season, so the layers settle, integrate. If the guamil is tall and the botado thick, you can grow on a patch without reburning for two or three years; if they are too small, maize won’t grow at all.
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_Pepitoria_, a staple squash plant, is planted first after the burning is finished, in March and April. Small mushrooms, called _xiquinché_, sprout from downed logs when the rains arrive, filling small corn-dough empenadas for a seasonal local delicacy. The first of the two maize crops is planted late in May, just in time to catch the first rains, and harvested in June or July. This is followed by a second planting, harvested in September or October, and — if the conditions are right — a third planting can follow this, harvested in December and January. Two types of corn are planted together, small/ _lcta_ and large/ _Petenero_, and they mature and are harvested at slightly different times in this cycle. Rice is planted mid-May, and harvested in September. Peppers (hot, not sweet) are planted in August, with black beans following in September through November, both harvested in January and February.

Some conservationists have come to recognize of the necessity of fire in this agricultural system. This defense of fire can be surprising, with conservationists who have worked in agriculturalist communities in the reserve defending their practices to those who fly in from abroad, delivering projects, funding, research, and authoritative expertise. How could we ever tell people to give up their fire? The Petén-trained conservationists will ask. What are we supposed to tell people to do instead? How else, when you are living at the absolute end of the road — the rutted, rain impassable dirt road, bridges crumbling — when you live there with no vehicle, with no supply stores, with no possibility for earning currency beyond the sale of what you have grown in your neatly bounded parcel, how else will you get nutrients into the thin, nutrient-poor, alkaline soils? Who will buy the fertilizers, year after year? Who will
deliver them? Who will provide the labor to spread them? Fire is the simplest, cheapest, and most accessible source of soil nutrients available, these environmentalists will explain. Replacing it is unfeasible and unwanted. Better to regulate and control it than to ban it altogether.

But how does an agricultural system built on movement, multi-year fallow cycles, and the life-giving potential of fire fit in a closely bounded, spatially-stabilized polygon inside a National Park? Lines and limits are drawn to restrict people's actions, hoping that fire, too, will respect these boundaries. Maybe they will, if the brechas are cut wide enough. If the promoters are thorough in their clearing of flammable material, using machetes, chainsaws, and leaf-blowers to expose bare unburnable earth. If the proper forms are filled out. If people pay attention to the color of the warning flags. If people can keep up with all of this, conservationists hope, maybe fire, too, will follow the rules and stay within the lines.

**Edge V: A Question of Responsibility, or Institution/Individual**

Waiting for the fire planning meeting to begin, Rosa and I chatted with Geraldo, head of the COCODE, and representatives of WCS and Balam. “Which do you think is more difficult,” Rosa asked, "being president of the Republic [of Guatemala], or president of the COCODE?” One of the Balam technicians clarified, “which is more difficult [mas difícil, technical difficulty], or which is harder [cuesta más, personal difficulty]? Because being the President of the Republic is probably more difficult, in terms of level of difficulty, but being the president of the COCODE
definitely cuesta más." Rosa responded, “When something goes wrong as the president of the republic, you can send somebody else out to take the blame. But here you’ve got to face right up to it.” Finally, Geraldo, actually holding the latter position, contributed his perspective: “it’s definitely más yuca [more impossible, intractable, problematic] being president of the COCODE.”

This is not the palace of the president, so who takes the blame if a fire crosses the line of Paso Caballos' external brechas? Is it the Q’eqchi’ agriculturalist in their regulated parcel, who lit the match? The village as a whole, for not maintaining the fire break and following protocols properly? WCS, as the primary institution supporting Paso Caballos’ fire management regime? Rosa, WCS’s field technician, for failing to ensure a smooth fire season? Balam, for not maintaining control of its part of the park around the station? CONAP, for not maintaining control of the park as a whole?

The anxiety caused by the possibility of an unruly fire, and heated arguments over who will take (potential) blame, crackle and spark conflict in the dry tinder of the social, political, ethnic, and economic differences that characterize fire work in and around Paso Caballos. Rosa told me how a man with Maya heritage working for another NGO once asked her, ‘can you imagine how the people of Paso Caballos feel, taking orders from a Ladina like you?’ She responded, ‘and do you know how much I’ve suffered, working for years with machistas like you?’

So many fires, so many different institutions, groups, and individuals with some stake in their flames. When fire is so multiple, responsibility for that fire is
distributed unevenly, with gaps and overlaps. CONAP is responsible for setting rules and restrictions, while the village's COCODE is responsible for enforcing them. Individual villagers, the COCODE, and Rosa will all suffer consequences if something goes wrong – not to mention the forest itself. To try to get them to follow the rules — particularly by filling out their registration forms prior to burning — Rosa tells the villagers about the satellite hot spot readings, describing CEMEC's daily emails as though they were high resolution spy surveillance over the village: “They will see the fire, in CONAP,” she tells them. “They will see that there is a fire where there is no fire scheduled, and they will call me up on the phone and ask me what happened, ask me who is lighting fires.” Anything to get a form filled out.

Rosa often claimed, “if a fire passes the line, I’ll get blamed. It will be my fault.” At the same time, she staked out the boundaries of her own responsibility — to WCS, to the community, and to the forest — very clearly: WCS does not work in firefighting, only in prevention. Once a fire has passed, she may be blamed for failing in prevention, but there her responsibility will end. When planning and coordination in the village seemed to be breaking down after months of extremely hard work — particularly when it was disagreement between villagers and other institutions that caused the breakdown — Rosa declared in frustration: “I’d rather see it burn than give one cent to fire control.”

It is the state that is responsible for this control, if and when a fire gets out of hand: CONAP, along with CONRED and SIPECIF. In fact, it is incredibly difficult to get support for prevention programming within the state, although that is a large part
of Marco Gonzalez’s personal mission as head of the fire department of CONAP-Petén. There just isn’t political support for it, he reported, although he does his best, trying to frame fire as a threat to political careers as much as to the forest, hoping to eke out better budgetary futures for his small office and projects. Even the permanence of his office was only created in 2008; before that, fire control in CONAP was an entirely seasonal affair, collapsed within other departments, and focused entirely on reaction. Rosa, Marco, Geraldo and others must constantly negotiate the discomforts of their positions, caught between their personal commitments, ideas, politics, and priorities, and those of the institutions they work for.

**Combustion**

I left Guatemala just as burning began in 2012 in Paso Caballos. I left before the promoter question was settled, before the brechas were cleared, and before the fires were lit. I know enough to know that there were no disasters, that the village cleared their lands, burned them, planted again for another cycle. Rosa spoke frequently of leaving the village when WCS’s two-year Conservation Agreement ran its course, but I do not think she has. Twice over, from a distance too far to smell the smoke, I have received weekly email updates between February-May, with neat maps, graphs, and comparative indicators, tracing year after year of fires from the sky. I never saw the matches lit, the botado burned, nor forest licked by edge-crossing flames.
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Fire draws together – willingly and unwillingly – villagers, NGO field staff working in Paso Caballos, conservation leaders making broad strategic decisions about the reserve, remote sensing and GIS technicians, politicians, satellites, agricultural and forest ecosystems, and seasonal weather patterns that are now beginning to shift unpredictably with global climate change. Leaving the multiple ontologies of fire — pixel, ecological threat, military weapon, resistance to power, agricultural technique — side by side, without reconciliation, shows how it is simultaneously tedious and terrifying, a tool of oppression and radical expression of discontent by the oppressed, an ending and a beginning to life on the landscape, and always out of control. Like the stories presented here, these ontologies bleed into and interrupt each other in ways influenced but never determined by the many edges upon which Paso Caballos balances: conservation and development, forest and farm, success and failure. As such, fire in Paso Caballos demonstrates the inherent instability of ecological and social worlds inside the MBR, and how these worlds are pieced together and negotiated, barely holding.
CHAPTER FIVE

A Known Place

Uaxactún is the "pulmón del mundo" (the lungs of the world), one of the village’s men declared to me proudly. The pronouncement came as we chatted in his kitchen; I had just finished surveying his household's access to basic good and services on behalf of a conservation NGO project. I had heard the phrase, pulmón del mundo (most often used to refer to the Brazilian Amazon), associated with this village's forest several times. But this time, after the man stated this fact he asked me to explain it back to him: is it true, he wondered, that forests "clean" the air, and that the air cleaned by Uaxactún's trees travels far away, like to France? It's true, I answered, doing my best to briefly explain global air circulation and the oxygen/carbon balance of the world. The answer was deeply satisfying to him,

37 For an analysis of the circulation of “lungs of the world” in global discourse, and its convergences with South and Southeast Asian environmental discourses, see Dove (2003).
explaining something else he wondered about—why so many foreigners are so
desperately interested in the fate of this patch of forest, and the people who live in it.
Our exchange made clear: the lungs of the forest exhale clean air, then pull
international conservationists in on their deep inhale.

That this moment confirming Uaxactún's place in the global forest
conservation order occurred during a household survey is no coincidence. Surveys,
studies, and observation conducted by outsiders are a constant, mundane part of
village life, ranging from technical forestry studies to detailed ethnographic
examinations of the community's dense social world to broad ecological and
archaeological views of the surrounding landscape. When I served as volunteer labor
for this NGO study, there were four other surveys circulating simultaneously in the
community. Even before I showed up at their doorsteps asking for household
characteristics, villagers easily identified me as a researcher (not a tourist) because I
had stayed for more than a single day. Children called me by the names of other
gringa graduate students who had worked there before, while their parents reminisced
pointedly about the gifts those visitors had left. This is a well-studied place, and the
knowledge made in and about Uaxactún is fundamental not just to the way that the
village enters regional, national, and global conversations, but also to the construction
of the village and surrounding forest as a local, knowable place.

Uaxactún's community forest concession permits villagers to eke out a living
from certified-sustainable extractive industries, harvesting timber and non-timber
forest products (NTFPs) for global markets. As villagers extract forest materials,
NGOs, state agencies, and other researchers like myself harvest data points, interviews, names, and numbers, processing them up into global chains of meaning and circulation. While in many cases the knowledge generated seems to disappear when a researcher leaves the village, it returns in the way that others enter and interact with the community – in their projects, their assumptions about ways of life, beliefs, and priorities common to Uaxactuneros (village residents), or even just in the simple decision to come study and work in this village over so many others in the reserve. But few results from studies are ever reported back to the community. A commonly-used Spanish verb for carrying out a study, sacar un estudio, literally means to extract or take out, reflecting this dynamic of removing data from its local place in order to turn it into authoritative knowledge. But just as extraction of forest resources transforms the landscape left behind, constant external study of Uaxactún shapes local understandings of identity and place.

Knowledge making and place making

Knowledge about the village and its concession have become integral to local senses of place and identity, shifting and shaping ecological and livelihood practices. In this chapter, I focus on the relationships between these dynamics of monitoring, study, and other "outsider" knowledge-making practices with the people, plants, and issues being studied. In contrast to fire in Paso Caballos, where the ontological worlds of institutions and villagers can come into violent conflict, this chapter explores the way that multiple senses of space, place, and identity in Uaxactún are co-constructed with official, external knowledge.
The idea that outsiders, WCS in particular, know more (or know better) about the village and its landscape than villagers themselves – a common sentiment that privileges technoscience and formal education over local knowledges – has become incorporated into local senses of place, closely tied to Uaxactún's ecological awareness and forest extraction practices. This analysis follows recent work on place, in which places are considered to be constructed translocally, amid complex relations of power and meaning that are not geographically bounded even as they produce seemingly localized places (Gupta and Ferguson 1992; Massey 1994; Moore 2005; Tsing 2005a). In Uaxactún, these translocal knots of knowledge, power, place, and identity are being constructed through evolving relations between villagers, the state, NGOs, and other researchers (including myself), and the landscape and its many non-human inhabitants. In particular, I argue that knowledge about Uaxactún made by outsiders is key to local senses of place, even though that knowledge is largely unavailable to local people. Rather than a sense of knowing, a sense of being known shapes how villagers understand their own and others’ place in the forest.

In this chapter, I analyze two knowledge-making practices in Uaxactún and their intersections with local senses of place and identity, one which only moves "outward" to funders and donors, and another which is also reported back to the community. The first is a “Basic Necessities” survey, designed to assess locally-relevant measures of poverty and well-being, data which were to be incorporated into the State of the Maya Biosphere Reserve report. The second is the ongoing monitoring of “quality” (marketability) in harvested xate (sha-tay) palm, an NTFP
that serves as the primary source of income for much of the community. Both convert complex social and ecological dynamics into generalized, comparable numerical measures in different ways, and for different purposes and audiences. In addition, both reveal the complex connections forged between villagers and institutions through knowledge-making practices, relations that can serve and transform both sides in unexpected ways. Reports that move outwards and serve institutional needs, like the Basic Necessities survey, also provide opportunities for villagers to connect with new actors, access resources, and sometimes to shape future projects and interventions into their lives. Reports that come back into the village, like xate monitoring, not only transform local livelihood and ecological practices, but also provide examples of positive change and data that is "useful" to local communities, both key for future NGO funding.

The Concession is the People

The name Uaxactún refers to several things beyond the ancient Mayan site from which the name is borrowed: first, it is a village with a deep Petenero identity, established over 100 years ago and undergoing several transformations and re-namings since that time. Second, it is a unidad de manejo (management unit), or a

38 The name was chosen by U.S. archaeologist Sylvanus Morley in 1916 to refer to the ancient Mayan city next to which the current village sits. The words “Waxac” and “Tun” mean “eight stones” in Maya, but were also chosen because they sound like “Washington.”
39 For most of its history, Uaxactún was a center for the chicle (an NTFP) trade, with the population (especially men) spending much of the year in forest camps and returning to the village during the off season or to transport NTFPs back to the
named area delineated in 1999 that covers 323 square miles (83,558 hectares) within the Maya Biosphere Reserve's multiple use zone. Finally, it is a timber concession, assigning management and usufruct rights and responsibilities through a 25-year contract between the Guatemalan state and the village non-profit OMYC (Management and Conservation Organization of Uaxactún). Of course, the distinctions between these three blur in practice, as one OMYC member's attempt to clarify for me made clear: "the unidad de manejo is just the area," he said, "the concession is the people." Echoing this equation of communal identity and contractual obligation, he informed me that a recent survey question (from yet another study) about the concession's benefits to the community simply didn't make sense: the concession is "a right," he insisted, too fundamental to the community's existence to ask about what benefits it brings.

Uaxactún's forest concession, the largest under community management in Central America, was one of twelve granted to local community organizations in the Maya Biosphere Reserve in the late 1990s and early 2000s, two of which were cancelled in 2010 due to repeated mismanagement and illegal land sales. The concessions join two industrial logging concessions and four delimited but uncontracted management units in the Multiple Use Zone, the piece of the reserve that most directly reflects the UNESCO biosphere program's emphasis on integrating biodiversity conservation with sustainable use and local livelihoods. The concession's granting was therefore part of a broad shift in global conservation during the late 20th

government's airstrip for extraction. See Schwartz's (1990) excellent social history of the Petén, forest labor, and identity.
century towards community forest management, one which has been widely critiqued in terms of its reconfigurations of politics, knowledge, subjectivity, and environmental and subsistence practices (e.g. Sivaramakrishnan 2000; Agrawal 2005; Zerner 1994; Pacheco et al. 2008).

Any village resident is free to join OMYC, membership that offers access to rotating temporary (up to one year) employment, and the ability to participate in concession management and policy decisions. Beyond the rotating positions provided by OMYC (timber harvesting, working the saw mill, etc), jobs are few in the jungle. The village is flanked by two well-excavated early Classic Maya sites, and the surrounding landscape is rich with many more. This archaeological abundance provides seasonal work for men who are hired to dig and sweep away layers of history in the dry season, or occasionally for women hired as cooks for the archaeological camps. Still, most men in Uaxactún rely heavily on NTFP harvesting for subsistence income, and opportunities for women to earn money are exceedingly few. Only 18% of adults had permanent paid employment in 2011, and a third of the community reported that xate, which can be harvested and sold year round, is their primary source of household income (Zetina Tún 2011).

To arrive at the village, you must first drive an hour from the central urban area of Flores to world-famous Tikal National Park, home of manicured lawns surrounding an ancient Maya city, easily viewed wildlife, and stunning temple-top views of the jungle canopy. The road to Uaxactún goes right through Tikal, veering off paved park roads onto 23km (14.3 miles) of bumpy dirt track through the jungle,
eventually leading to the long swath of open grass – a defunct air strip, now decorated with sports fields and lazily grazing horses and mules – that runs down the center of the village. Houses are arranged in loose clusters snaking around and off from the landing strip, which until the 1980s provided the only direct access to the village.

Entrance through Tikal deeply shapes Uaxactún, providing guard and maintenance jobs for a few Uaxactuneros and fueling the village’s dreams of developing their own Maya sites for profitable ecotourism. The park’s guarded gates also provide some protection for the concession against easy invasion from outsiders, illegal logging, and cattle ranching.

OMYC and Uaxactún have been widely praised as an example of successful community forest management due to the concession’s well-maintained forest cover (Gretzinger 1998; Nittler and Tschinkel 2005). However, these accolades ignore the fact that the concession generated debt rather than profit for many years, with poor financial management, oversight, and guidance. In addition, OMYC's leadership is challenged by a fractured, socially and politically diverse membership. By regulation, members elect the OMYC board of directors every two years. In practice, however, each new board quickly takes the blame for any problems that arise in the concession, and have in recent history always been ousted long before their term is up. While

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40 Early NGO inputs and accompaniment focused heavily on timber harvesting practices and infrastructural development, with financial and administrative decision making largely left up to inexperienced local administrators. The past few years have started to see a push back in the other direction, with a variety of institutions recognizing the necessity for administrative training and assistance, while also instituting a variety of neoliberal transparency and accountability measures that lean in similar directions.
concession jobs theoretically rotate through all OMYC members, in practice they go to those with friends – or at least, a lack of opponents – on the current board of directors, further hastening the desire for overturn among those left out. Factions split along old tender lines again and again, tearing apart the administrative structure from the "participatory" inside, but this tumult in OMYC leadership is perhaps a reflection of how truly democratic the organization is. Social and political divisions run like fault lines through the community, and the concession’s institutional structures and ecological landscape are deeply entangled with this social world. After all, "the concession is the people," and Uaxactún’s people are infamous among state and NGO staff (who otherwise extol the pleasures of working in Uaxactún’s beautiful forest) for their social turmoil.

*WCS - an NGO at home in Uaxactún*

The Wildlife Conservation Society has a long history of working in Uaxactún – in fact, the Guatemalan branch of this US-based NGO started with a single short-term project in the village in 1996, and has slowly expanded to its current broad geographical and political influence. True to its origins, WCS-Guatemala has maintained a constant, if part-time, residential presence in the village over the years, building up from a single hut to a large multi-building compound shared with other institutions. Over the years, most of the houses that WCS built were burned down by villagers, but WCS has rebuilt every time. While relations between the NGO and villagers are never settled or conflict-free, especially given divisions within the
community itself, this demonstration of commitment has built up a slow and steady trust between the NGO and many Uaxactuneros that other institutions fail to achieve.

If the concession is the people, WCS's current field technician in Uaxactún, Juan Castellanos – friendly, open, and outgoing – is well suited to his position coordinating between the village and NGO. Born and raised in Flores, Juan spends between 25-50% of his time living in the village, depending on the season and projects underway. The work in the village is "un rollo social," he tells me – tricky social business.41 Echoing the famous development critique of Mosse (2005), Juan told me that official measures of success and failure in the village didn’t mean much: "Maybe at the end you get something that looks like ‘good results,’” he said, "but [projects] won't actually do anything without the social aspect." Walking through the village, he greets nearly everybody he passes, calling out friendly hellos to a few and stopping to linger in conversation with most, keeping close tabs on daily happenings, concerns, and small-town gossip. With all this pausing to chat, it takes four times as long to get anywhere; Juan jokes: it's like we're in Antigua, visiting the stations of the cross. Even when there is nothing much to say, there is a friendly presence to be made felt, an enduring human connection to be maintained with the institution.

WCS, though far from the only institution working in the village, is central to dynamics of knowledge, livelihoods, and identity in Uaxactún. With its mission of scientifically driven biodiversity conservation, the NGO is regularly involved in a

41 The Spanish term rollo carries rich connotations that are difficult to translate – in this context, it most directly means “business” or “matter,” but also calls up something complicated, messy, or difficult to navigate.
wide variety of studies and monitoring activities in the village. Both the Basic Necessities survey and xate quality monitoring are carried out in part by WCS, as were several other studies and surveys conducted during my visits to the village. This knowledge production about Uaxactún goes hand-in-hand with WCS’s long-term commitment to its residents and forests, and is an important part of the institution’s broader work across the reserve. In the following sections, I focus on how these external studies intersect with residents’ experiences of local identity and place and transformations in their ecological and livelihood practices, rather than their role in constructing official understandings of the reserve for broader conservation contexts.

**Aggregating and Extracting: The Basic Necessities Survey**

The Basic Necessities survey is a prime example of the extractive model of knowledge production about Uaxactún, as well as of the many transformations, erasures, and elisions required to translate complex village lives and livelihoods into standardized numerical measures. The 2011 survey was a follow-up to a first round of focus groups and surveys carried out by WCS and Asociación Balam in 2009, which established a baseline measure of local poverty for a major multi-year project funded by the U.K. Department for International Development (DFID; see box on following page for details on survey purpose and methodology). The survey was re-conducted in 2011 and 2012 in four different reserve villages in order to assess whether or not the DFID project was having a measurable impact on the well being of residents in target communities. My involvement with Basic Necessities began through my
recruitment by WCS contacts as a number cruncher, helping to process and interpret this new iteration of survey data for another village, Carmelita. But after struggling to make sense of numerical shifts in perceptions and poverty without any local contextual knowledge, I was invited to help conduct the follow-up surveys in Uaxactún.

As it turned out, however, helping to carry out these surveys in a place that was already familiar only increased my uncertainty in interpretation, rather than diminishing it. Essential to the Basic Necessities methodology was a direct comparison of the same households after two years time. The first survey was carried out as a semi-census, going door to door to get as complete a sample as possible in

Basic Necessities Methodology

The Basic Necessities survey is designed to identify and measure locally-relevant indicators of poverty and well-being, rather than relying on globally-standardized calculations. The methodology begins with focus groups to identify goods and services considered locally necessary, or potentially so. These exercises are used to compile a master list of 35-40 items that might range from clean drinking water to chainsaws to personal computers. This list then forms the basis for the survey: a representative of each household is asked to indicate first whether they have access to or own the item in question, and then whether or not they consider that item a "basic necessity," defined as "things that all families should have and none should live without" (WCS Living Landscapes Program n.d.). Any item that 50% or more of surveyed households declare a necessity is then included in community-wide calculations of poverty, regardless of how many respondents have access to that item.

Each household's "poverty index" is calculated, representing the total number of surveyed items that a household has access to weighted according to their communal rating as necessities. For example, if access to medical care is considered a basic necessity by 100% of respondents, and cell phones by only 85%, then a household with access to a doctor but no cell phone would have a better score than vice versa. In WCS’s comparison of Uaxactún’s survey results between 2009 and 2011, a very slight reduction of poverty was seen, with no change in the distribution of poverty within the community.
order to measure DFID project impacts across a broad swath of the community. Each household surveyed was recorded by numbering its rooftop on an aerial photograph, by GPS point, and by recording the family's surnames. For the follow-up, our job was to follow the marked aerial image to find the same families from the first round, in order to directly measure improvements or declines in household well-being.

Unfortunately, the map had been lost. Instead, we only had the list of family names, so it fell to me and my co-surveyor from Asociación Balam, Julian, to re-mark the map while trying to find households based on surnames alone. But with complex naming conventions and a small village with multiply-overlapping kinship lines, this made things particularly difficult. If the household name "Alvarez Nuñez" appeared on the list, was this a family headed by a man surnamed Alvarez Nuñez, or one in which the husband's last name was Alvarez and his wife's Nuñez, giving their children the joined name? I rarely felt certain that I had found the correct household, but wandering through packed-dirt paths and calling out to quickly canvass the names of each house I passed provided an exceptional introduction to the relations of kinship and geography mapped out in the village. As would soon become a familiar pattern, the things I learned from conducting this survey were rarely those things we set out to measure.

The Basic Necessities methodology translates complex questions of priorities, preferences, and access to goods and services into a numerical measure, ready for

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42 Naming conventions in (Ladino) Guatemala use the paternal surnames of a person’s father and mother, in that order. In some cases, married women may choose to take on their husbands’ paternal surnames in place of their own maternal surname.
aggregation and comparison across sites. Julian and I acted as instruments of standardization, gathering ranges of data and slotting them into their proper categories. We moved slowly from house to house, matching our observations and inferences with the answers of our interlocutors and working to create clear distinctions between 'yes' and 'no' answers in interaction with respondents who favored evasive, grey-zone answers such as “cuando hay...” (we have X item, when it's available). Other answers, while apparently clear, might be undermined by their accompanying commentary, such as one woman's answer that: "Yes, a chainsaw is a necessity, for when I'm fighting with my man!" Our algorithms were inconsistent, evolving, worked out in the interactions within each household – what to mark down when a husband and wife disagree about whether a television is a necessity? – and then again reset between survey days as we talked between the two of us about which questions were hardest to get "good" (yes/no) answers to, and how we might gently rephrase them without invalidating comparison to previously gathered answers.

More worrying to me than the transformations of some individual answers was the complete erasure of others. In one household, the husband returned from work partway through my survey and took over answering while his wife retreated from her previous friendly engagement to a wary, watchful silence. In another, a bare hut of thin poles and thatch built at the farthest edge of town, a Q'eqchi' Mayan family answered with hedging “cuando hay”'s to questions that most households had happily joked about: Access to three meals a day? I sometimes eat five! The family’s survey results proved a blunted reflection of their relative poverty and marginality, but as I
walked away from their house I realized that I had misconducted my surveying: their names did not, in fact, appear on my list, and their data would therefore have to be excluded from the overall analysis. By sheer luck of methodology, this household was erased, its poverty not even sample-able.

*Open to interpretation*

Only once the villagers' nuanced answers had been coded and quantified did our task turn to making interpretive sense of the results. When the survey was finished, I set to processing the data in excel spreadsheets, trying to pull meaning out of the numbers again. This data analysis further disappeared the grey zones of surveying, aggregating yes, no, and necessity answers into household and community-wide measures of poverty and access. I remembered the stories and tentative moments, and just how uncertain each data point had felt as it was collected, but my uncertainty was displaced by an emergent trust in the aggregate results as the final graphs and statistics surfaced out of my spreadsheet. After all, one family's "cuando hay" had been marked as a "yes" for the question of eating wild game meat, but another had surely chosen to answer "no" when they actually ate deer regularly, knowing that the survey was being conducted by a conservation NGO that might frown upon hunting. Overall, the story of well-being in the community was probably pretty accurate, or more so than the results for individual houses. In the data and knowledge that I was helping to construct, a charismatic truthfulness emerged in the aggregate of individually untrustworthy data points.
Although the village's overall poverty index distribution had not changed much since the 2009 survey, patterns emerged that indicated a balance of improvements (many more motorcycles) and losses (a perpetually broken community water tank), as well as shifts moving faster in people's perceptions of necessity than in their actual access to those items – internet access being a model item for this pattern. Factors that did not change the overall statistics were the most important to Julian: he pointed out that he was extremely happy to see so many houses where only the adults worked, not their children, a trend that he connected to the growing emphasis on education in the village. He was also fascinated by the patchwork of income sources that each household drew on, and the implications for NGO practice in the village – nearly all families answered with a single income source (usually xate) at first, but upon further digging it turned out that most had three or four minor sources of monetary income in any given year.

Because the overall poverty index did not change very much, the survey results failed to reflect what DFID project implementers insisted were widespread benefits and improvements in village life. Instead of serving its original purpose of an aggregate measure of project impacts, smaller items in the data ended up being more useful and interesting to NGO staff. For example, in response to the survey question of whether they ate wild game meat, many people responded: “no hay” (there isn't any). Julian optimistically chose to interpret this response not as a reduction in local wild animal populations due to overhunting, but as a reflection of fewer people dedicating themselves to hunting as a source of income, resulting in fewer
opportunities to buy wild meat in the village. The village-wide results showed that both the consumption of wild meat and its perceived necessity had dropped significantly, while perception of domestic fowl and pigs as necessary had increased without a corresponding increase in animal ownership. Had economic or legal factors, conservationist cultural values, loss of local animal populations, or some combination driven the reduction in wild meat consumption? Was the increasing perception of the necessity of owning domestic animals a response to declining availability of (otherwise preferred) wild meat? While these results raised more questions than they answered, once again they demonstrate that the things learned from the Basic Necessities survey were rarely related to its purported purpose.

An over-examined life: surveys and sense of place

Concurrent with the Basic Necessities survey, there were at least four other household surveys going on or planned in the community. Most results never find their way back to the village; the findings of these studies are directed outwards to international academic and professional audiences, to NGO donors or granting agencies, or into state and NGO project files. Many villagers expressed frustration with this dynamic, asking, what do these studies do for us? Moving from house to house, I carried my ethnographer self alongside my NGO surveyor role, inviting respondents to ask me questions as well or to discuss survey items as we went. The most frequent response to this invitation reflected exasperation with the intensely studied nature of life in the village. People asked: What is this survey for? Who will see the results, will we? What happens if the results don't look good for the project?
Of course, much of the knowledge generated by these surveys, while never formally reported back to villagers, is already familiar to them in intimate detail. One of the other concurrent surveys enrolled kids aged 13-16 from the village school to carry out the door-to-door work, teaching them basic research methodology while providing free labor for the NGO conducting the study. The kids were instructed in the proper way to politely approach a home and ask questions, but also reminded not to bother asking questions if they already knew the answer. The teacher prompted: it wouldn't be nice to ask a family whether they have electricity if you know they don't, and we all know which houses do and which don't.43 "What about Doña Anna?" he asked as illustration, "her house by the entrance to the ruins, does it have electricity?" "Yeeeess," answered the chorus of teenage voices. Right, he responded, so you don't have to ask. You don't want to be rude and leave people with a bad feeling about surveys, the teacher concluded, because there will always be more.

Several villagers also recognized that those conducting studies often brought other benefits along with them, or might return to the community in other capacities. One man pointed out that Roan Balas McNab, American director of WCS-Guatemala, first came to Uaxactún for his Master's research, and then stayed – the origin of one of the most influential NGOs in the reserve today. At least three others who originally came to conduct studies have returned to work in the village on behalf of NGOs. Foreign researchers like myself often choose Uaxactún as a research site due to its relative accessibility, safety, and the availability of institutional introductions to key

43 There is no electric grid in Uaxactún, but some houses have gasoline-powered generators or a rooftop solar panel.
people in the village; I crossed paths with two other U.S. graduate students there. While the implications of our academic studies may be even farther removed from daily village life than those of NGOs, our presence fuels small-scale local economies and a sense of connection to global ideas, markets, and worlds otherwise inaccessible.

This sense of connection is also a sense of place. Through the experience of being the objects of constant study, Uaxactuneros come to know their place as one defined by its standing forests and the "clean air" they produce, its lauded example of community-based management, and its carefully cultivated cultura de conservación (culture of conservation). This phrase, deeply reminiscent of Agrawal's environmentality (Agrawal 2005), is heard often in the local school, community assemblies and meetings, and documents, reports, and presentations about the community. These priorities of identity and place are constructed in interaction with outsider institutions and individuals, and in many ways villagers adopt these along with the sense that others know their place better than they themselves. One survey respondent told me (without noticeable irony) that WCS had more information about the community and concession than OMYC, such that now when they want to know something about themselves, they go to the NGO to ask.

Authoritative knowledge about this place was increasingly recognized as extra-local, while some of the most valuable local knowledge included the ability to access and navigate external discourses, institutions, and resources. Of course, 

\[44\] I do not mean to imply that there is no "local knowledge," ecological or otherwise, but rather that there is a common sentiment that authoritative statements about the village and its forest, those recognized to be true by broader audiences, must refer to
beyond the ways that these outward-bound studies enter Uaxactuneros’ senses of place, other monitoring efforts are reported back to community members. These practices, like the monitoring of xate quality, can shape not only senses of identity and place, but also local arrangements of labor, livelihoods, and ecologies.

Caring for Xate, Caring for Xateros

Josue paused as we hiked along the forest path and crouched down to carefully untwine a tightly wrapped tendril of climbing vine from a xate palm leaf, twisted and pulled by the vine's pernicious grip. “There are xateros (xate harvesters) who don't take these off,” he said, “but, oooh! Pobrecita! (poor little thing!)” he declared, delicately smoothing out the crumpled palm leaf. “When it rains it will become more beautiful,” he assured me. Implied in this beauty was the leaf's recuperation into being harvestable, marketable, a potential source of income for xateros like himself, to be sold and shipped to the U.S. and Europe where the leaves are used in floral arrangements. Beyond a simple economic relation, however, his actions pointed to the ongoing transformation in Uaxactún of xate from a "natural," exploited part of the landscape to something to actively cuidar, to care for.

The current transformation in Uaxactún residents' relationships with xate, the primary NTFP harvested in the concession, is at the center of evolving webs of knowledge, identity, institutional alliances, and livelihoods. Xate palms — actually or be based on external monitoring data. In practice, much of what is eventually recognized as official, external knowledge has actually been passed to the institutions through informal interaction with villagers.
Three species of xate palm (*Chamaedorea spp.*) are harvested in Uaxactún, known by the Spanish common names *jade* (jade, also called *macho* or male), *hembra* (female), and *cola de pescado* (fishtail). All three are understory plants, preferring dense shade, and grow in rich ecological interaction with several species of beetles and thrips (pollinators), as well as birds and mammals (seed dispersers). Once harvested, xate leaves can stay fresh for up to 4-6 weeks, making them an ideal product for international floral markets.

The market for jade (*C. oblongata*) persists year round, and the palm is found throughout the concession in high abundance. *Hembra* (*C. elegans*), too, grows abundantly in Uaxactún, but its market is concentrated in the dry season (February-May), with a surge around Easter. Seeds of both species are collected locally by xateros, and sold to OMYC for enrichment projects, taking 2-4 years to mature and produce seed. Jade harvested in Uaxactún is exported to the United States and Europe, while hembra is sold primarily to the Netherlands.

*Cola de pescado* (*C. ernesti-augustii*) is by far the most valuable of the three species, with a year-round market. Very little of the palm is found in the concession; some people claim that fishtail has never grown in this area, while others report that it used to be abundant but was overharvested to near extinction. It is now being (re-)introduced into Uaxactún's forests by a municipal project: seeds are bought from dealers outside the community for Q300/lb ($38/lb), and the plants will take up to eight years to mature and produce seed.

Three species of xate palm — are simultaneously the "daily beans" for the vast majority of Uaxactún residents, the object of intense study and regulation, a commodity marketable to international floral markets, a marker of local identity, and a ubiquitous part of the forest landscape. Between 60% and 80% of Uaxactún households rely on xate income at some point during the year, and the plant accounts for 30% of total monetary income in the community (Zetina Tún 2011). Because of this extraordinary subsistence role, recent conservation and development projects designed to increase xate's local abundance in the forest understory are a rare example of convergent ecological and economic goals in the reserve. NGO-driven practices of study and scientific curiosity,
at the heart of these projects, are central to ongoing shifts in the relationship between xate and Uaxactuneros.

Ecological care

I use the term "care" to describe particular relations – affective and practical, material and discursive – both between Uaxactún's xateros and their palms, and between WCS (and other institutions) and Uaxactuneros. The term has been used with different definitions and theoretical orientations in a wide variety of literatures, most often in feminist analyses of feminine-gendered labor, especially childcare, healthcare, and education (Hochschild 1995; Held 2006; Mol 2008). Care has also appeared in the environmental context, particularly in ecofeminist work critiquing associations between 'caring' women and nature (Salleh 1993; MacGregor 2004; MacGregor 2011). In the case of Uaxactún, however, it is men who are involved in the discursive and labor formations that I describe as 'caring,' requiring a broadening of the term from these heavily gendered contexts of care.

Other feminist theory has taken up the idea of care in a much more general sense, describing it as involving both practice(s) and a particular disposition or set of values (Tronto 1993; Held 2006). A good working definition is provided by Joan Tronto and Bernice Fisher:

On the most general level, we suggest that caring be viewed as a species activity that includes everything that we do to maintain, continue, and repair our 'world' so that we can live in it as well as possible. That world includes our bodies, our selves, and our environment, all of which we seek to
interweave in a complex, life-sustaining web (Tronto 1993:103, emphasis in original).

Importantly, this definition is not restricted to care for humans, nor to actions by or on autonomous individuals, but rather recognizes care as fostering complex, distributed, ongoing relations of broad interdependence. I therefore also use care to decenter human exceptionalism in my analysis and to emphasize that xate, too, is an active participant in these relations – what it likes and needs, how it grows, when it reproduces, all these affect emerging formations of labor, livelihoods, and identity in Uaxactún. In a similar usage, Mol et al. (2010) describe care as a logic or ethics that seeks to ameliorate, to make more livable, but without an assumed end goal of an ultimate best practice, cure, or solution. Instead, an ethics of care emphasizes that the question of the "good" is never settled, and always unfolds in particular contexts "full of complex ambivalence and shifting tensions" (Mol et al. 2010:14). Importantly, these definitions emphasize that practices and relations of care are never disembedded from complex intersecting sets of power relations, and that care is not an exclusive category – particular practices can simultaneously be caring and exploitative, instrumental, or oppressive.

For the case of xate in Uaxactún, I build on these definitions to emphasize an ecological notion of care, attending to the interplay of knowledge, power relations, and material interaction that shape the way care emerges at particular scales and relations, but not others. WCS has led many recent xate projects in the village, including formal studies, ongoing monitoring of extraction and marketability,
understory enrichment, and others. WCS and its projects have been instrumental in turning Uaxactuneros' relationship with xate from simple extraction into complex relations of care. The shifts described in this section are always partial – not total transformations, but complex, subtle, and often contradictory processes of change in both material and discursive relationships between villagers, plants, institutions, and the forested landscape. These projects enact multiple scales and types of care – of villagers for understory palms, of an NGO for local people, and of a community-NGO alliance for a forested landscape – revealing how multiple forms of care can simultaneously support and undermine each other, particularly when considered within broader political ecological contexts.

_Caring for Xate..._

On the day he took me harvesting, Josue showed me how to collect xate according to the rules of OMYC's sustainable management plan, leaving at least two full-grown healthy leaves, or one plus a shoot of new growth (called a _candela_, or candlestick), to ensure the survival and flourishing of the plant. But he also cared for plants that he wasn't harvesting as he moved through the underbrush: removing diseased or insect-ridden leaves, or patiently disentangling the palms from aggressive vines. Josue is a xatero, a forest labor identity that builds on histories of harvesting other NTFPs in Uaxactún, particularly chicle, the natural rubber used in chewing gum before the invention of synthetics. Many Uaxactún residents still refer to themselves as _chicleros_ (chicle harvesters), even though the market for chicle dropped.
enormously in the 1960s, due to political upheaval in Guatemala and the invention of synthetic gum alternatives.

Xate has since replaced chicle at the heart of Uaxactún's forest livelihoods, and now stands as a symbol of regional histories of extraction in which it never really took part. Other NTFPs are still harvested in the concession, including chicle (Manilkara zapota), allspice (Pimenta dioica), ramón nut (Brosimum alicastrum, sometimes sold as "rainforest nut" in English), and others. But xate has thoroughly permeated the village as a symbol of local identity, even forming the basis for a costume in the village's annual Independence Day pageant. One member of OMYC's board of directors referred to xate harvesting as an "actividad de nuestros abuelos" (activity of our grandfathers), while another told me that xate had always been "everywhere," but until recently was just one more plant on the landscape, completely without value. The latter version is perhaps more historically accurate, but the imaginative memory of xate-cutting abuelos reflects current intersections of local identity and forest livelihoods. By connecting xate with old chiclero histories, the palm is tied to a deeper sense of identity and tradition based on living and working in the forest – a historical claim that also helps strengthen community demands for ongoing management and extraction rights within the reserve.

*Learning to Care*

The material and discursive underpinnings of xatero identity are shifting, and not just from one NTFP to another. Xateros – those who cut – are becoming
conservationists – those who protect. Josue's heartfelt reactions and care for xate as he collected leaves is one example of this shift, an affective connection shaped by a recent six-month job with WCS in Uaxactún. These WCS jobs rotate through OMYC members, and include daily care for xate in nurseries around the NGO's housing compound in the village and in plantations beneath the concession's forest canopy. Uaxactuneros hired by WCS learn to talk about ‘what the plants like,’ and are trained to be mindful in their work with the seeds and seedlings. This manifests in many details: xate seeds are neatly arranged in furrowed rows of soil (a strong contrast with the spatially-irregular sowing of crops in traditional milpa agriculture), watering pipes over seed beds are patiently watched and manually rotated so that the water falls evenly across them, thatch roofs over the nurseries are tended to mimic the shade of the forest, and watering is adjusted to seasonal patterns of heat and humidity – not to replicate natural conditions, but to encourage the palms to survive and mature more quickly.

These micropractices of care are part of recent projects to increase the abundance of xate in Uaxactún's forests, established through their formal Acuerdo de Conservación (Conservation Agreement) with WCS. This agreement provides material and technical NGO support to the community in exchange for participation in conservation activities such as annual fire management plans, patrolling against

45 Of course, not all harvesting practices were previously purely destructive, and indeed historic chiclero practices of leaving chicle-producing trees to recover for several years between rubber extractions is often cited as proof of a longstanding "sustainability" or "conservationist" ethic among Uaxactuneros and Peteneros more broadly, though these practices were not understood in these terms at the time.
land invasions, and administrative reform within OMYC. Through the Acuerdo, WCS provides support for education in the community, assistance with fire management and monitoring of the concession, financial incentives for sustainable harvest of xate, and xate enrichment programs in the forest. Responsibility for xate projects is shared by OMYC and WCS, with OMYC buying seeds or seedlings and WCS paying for the labor (including Josue’s six-months) involved in germinating and tending seeds in their outdoor nursery, and in transplanting a minimum of 20,000 palm seedlings per year into the concession's forest. There are xate enrichment projects underway by a few other organizations as well, including the Rainforest Alliance and the Municipality of Flores (in which Uaxactún is located), but WCS’s permanent physical presence in the community and Acuerdo-structured funding commitment make its projects particularly influential.

These enrichment projects reflect a shift over time from a focus on xate harvesting practices to increasing the abundance of the palm in the concession’s forests. Along with its nurseries, WCS started an experimental xate plantation in an abandoned agricultural patch regrown into secondary forest at the edge of the village. In it, school kids were given responsibility for 20x20m plots, taught to transplant, tend and harvest the xate without permanently damaging the plants, and allowed to keep the small income from any xate they grew and cut. The plantation was, according to Roan Balas McNab, an experiment in three senses: biological, economic, and social. Biologically, the xate flourished under the guided care of the kids and WCS's rotating staff. Economically, they determined that it would take about nine or
ten years to start to see a significant return on investment in such a plantation, but that at that point the plots would be producing seed as well as plenty of palm leaves, becoming economically as well as ecologically sustainable. But socially, Roan told me, it was a disaster. Being so close to the community, as opposed to a tough day's walk through the jungle, the experimental plantation was regularly sacked by xateros, and Roan noted that such a project would need constant vigilance and patrols to work – thereby negating any economic benefit.

The xate enrichment projects that WCS is currently implementing as part of the Acuerdo do not follow this private-property plantation model, instead allowing OMYC to select an area of the concession already designated for NTFP harvest and transplanting palm seedlings to enrich the natural abundance of a common resource. It is in the nurseries associated with this project that new relations to xate are being formed. The ability to reduce germination time for xate seeds was accidentally discovered by a Peace Corps volunteer who forgot to remove the seeds from a diluted peroxide solution simply meant to wash them, leading to a 10-day soaking practice that causes seeds to germinate about a month before they would with simple watering. This accident led to a more experimental relation to growing xate, requiring hired Uaxactuneros to cultivate curiosity, to learn to recognize the needs of the plants with great sensitivity (signs of sun damage, insect infestation, etc), and to become familiar with the different growth and reproduction rates of the three different species. The three men who rotated through the WCS positions during my fieldwork — all of whom usually rely on xate harvesting as their primary source of income — spoke
with great pleasure about how much they had learned about xate, identifying this new knowledge as their favorite part of the job, and demonstrating a real tenderness in their interactions with the plants.

*Monitoring and Transformation*

The move to increase xate's local abundance and to institute sustainable harvesting practices was triggered by the rise of external monitoring practices that came along with Uaxactún's concession contract in 2000. In the concession's early years, xate was sold to external contractors by weight, encouraging xateros to simply cut as much as they could – including damaged or diseased leaves – to earn money.⁴⁶ A 2004 WCS study of the quality of harvested xate (defined as the marketable percentage of harvested leaves) estimated that only 25-30% of leaves sold to contractors were being selected for market. Concerned with overharvesting and poor economic returns from this system, a xate selection facility was established in Uaxactún, operated by OMYC with NGO accompaniment. The concession now pays xateros per marketable leaf instead of by weight, doubling the price per leaf paid to harvesters, allowing more oversight and control within the concession, and capturing a larger proportion of xate's economic benefits within the community by cutting out contractors and selling directly to exporters in Guatemala City (OMYC 2009). In addition, women from the village are hired for sorting and selection of harvested palm leaves, adding a frequently touted benefit to local women to the project.

⁴⁶ This local NTFP extraction sold to extra-local contractors was the dominant form of labor organization in the Petén throughout most of the 19th and 20th centuries (Schwartz 1990).
Around the time that the selection facility was introduced, WCS conducted another study of the ecological impacts of xate harvesting practices, determining how many leaves could be cut from a plant without killing it, and OMYC developed its current xate management plan based on this information. These days, actual cutting is not surveyed in the field; instead, the continued monitoring of xate quality in the selection facility has became a proxy measure for sustainable harvesting practices – less waste at the market selection point indicates less careless overharvesting in the forest. Each individual xatero now has their quality statistics reported back to them as an assessment of their harvesting practices. Similarly, the total percentage of xate selected for market is calculated by WCS, and then reported back to the concession.

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47 CONAP is formally responsible for field monitoring of xate extraction, although this has recently been part of a very strained relation that has focused more on other activities of xateros, such as hunting or leaving trash in campsites, rather than harvesting practices.
by graph as a measure of their ecological management success (see Figure 5.1). Since this monitoring began, the percentage of leaves selected for market has remained well above the 70% minimum set by OMYC's management plan, and in 2011 stayed consistently above 90%.

A poster-sized copy of the xate graph hangs in the selection facility, where WCS posted it to communicate monitoring results to xateros and selectors. However, reading graphs requires specialized visual and numerical literacy, and this one was not designed well for communication to a non-expert audience. In fact, the graph is hard to interpret even for those familiar with the visual medium (look, for example, at the inconsistent timescale on the bottom, the unexplained line at 70%, etc.), and for those unfamiliar with reading scientific figures it is nearly impenetrable. For people working in the selection facility, the graph is usually interpreted simply as a reminder that somebody is watching to make sure they're not screwing up. In my visits to the facility, I never once saw anybody glance at the graph without my prompting, until the day a USAID delegation visited and gathered around it to see the impacts of their funding, at which point the graph very successfully communicated responsibility, collaboration, and sustainability to an important donor (figure 5.2).

Reporting back

Despite its local illegibility, the graph hanging in the selection facility forms an important part of WCS's new initiative to report monitoring data back to

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48 2009 is entirely absent from this graph due to a lack of funding for ecological monitoring in WCS that year. Previous monitoring was funded through the WCS Living Landscapes program, and beginning in 2010, funds for this activity were guaranteed by their inclusion in the Acuerdo de Conservación.
community-managed concessions throughout the Maya Biosphere Reserve, a strong contrast to the Basic Necessities and many other studies that simply extract information. 2011 marked the first year of this reporting, with formal presentations and electronic and hard copy summaries of findings presented to the leaders of several community concessions, including OMYC's board of directors. These ecological evaluations combined broad, remote-sensing based factors from CEMEC (deforestation, fire damage, etc) with fine-scale indicators particular to each area (like xate quality in Uaxactún), creating a somewhat general rubric for comparison between concessions.

Uaxactún's 2011 presentation was highly congratulatory and full of lively discussion, with frequent questions from OMYC board members and comments
provided by Juan Castellanos, who acted in a kind of translator capacity, providing local context and explanation for the data projected on screen. For example, when looking at a map of satellite-detected fires, Juan pointed out that all the fires were well within the limits of the designated agricultural area of the concession (controlled burns are part of local agricultural practices), and that although they registered as burnt forest according to satellites and technical definition, locals would recognize the burned lands as *guamil* (regrown fallow), not as mature forest.\(^{49}\) Juan's guiding commentary also reflected his subtle awareness of the gap between NGO lingo and local ways of speaking. Once, he recounted to me, he had seen a poster in Uaxactún discussing "tools for sustainable development," but people did not seem to understand what it was about. He asked a few men what they understood by the word "tools" and they answered: hammers, screwdrivers, saws. He made clear that the issue was not with literacy *per se*, but with the ways that language shifts between formal institutional and rural contexts – an issue that echoed back to me when viewing the xate quality graph in the selection facility. Still, even basic efforts to report back to the concession sets WCS's xate quality and other ecological monitoring apart from most studies.

In the case of xate, monitoring and reporting back have played a pivotal role in the transformation of institutional, labor, and ecological relationships. Even without understanding the xate graph, its presence in the selection facility communicates the presence of external oversight and the supportive message that the

\(^{49}\) Forests are defined by CEMEC as 30% or more canopy cover and a minimum 5m height.
concession is successfully managing the ecological sustainability of a key NTFP. And this reporting back also serves the NGO. One WCS biologist emphasized the importance of external evaluation for the concession, and the interdependency between WCS's monitoring program and OMYC, formalized in the Acuerdo de Conservación. Through this exchange, OMYC gains measures and reports of their ecological success that have high reliability and rigor, as marked by coming from external sources. On the other side, WCS can say that their monitoring programs serve an important purpose for local people, justifying further funding for future monitoring of the landscape.

...Caring for Xateros?

External monitoring practices are found at the heart of new formations of caring for plants, caring for the landscape, and caring for people. These knowledge-making practices, and the projects attached to them, continue to transform xateros' relationships to the forest landscape and the plants within it, shifting these from pure extraction to more complex interactions characterized by curiosity, nourishing, and care. WCS's xate projects – from germinating, raising, and transplanting seedlings to careful harvesting, selection, and monitoring of marketable leaves – have changed the plant from a natural part of the landscape into something that is actively cultivated and cared for. At the same time, they are changing xateros from ecologically destructive bulk harvesters to careful conservationists. Most xateros have not yet worked in WCS's nurseries, but as people rotate slowly through these jobs and interact with different kinds of monitoring and attention, they emerge with
transformed perspectives and affective connections to the plant, its place on the
landscape, and shared human-xate futures.

But as much as these transformations are hopeful in many ways, the focus on
increasing the abundance of xate leaves many problems unaddressed. A large
proportion of Uaxactuneros rely on xate for basic subsistence, and when I expressed
my hopefulness about these projects as a way of caring for people by way of caring
for the plants and landscape, Juan Castellanos brought me back down to earth.
"Maybe…" he hesitated, "No, maybe not. In the question of food security, no. It
wouldn't cover it. It wouldn't guarantee enough income." Similarly, when Josue spoke
to me of his pleasure in learning about xate in WCS's nurseries, he emphasized his
changed perspective, but also pointed to the limits of this knowledge:

Before working here, I didn't know anything about xate – how to grow it, how
to... nothing. But thank god, I learned, I learned. Not just to cut. Not just to
destroy. Because to be a xatero is to destroy. But I'm not saying... Maybe you
have a huge need, and if you find a little plant of xate that just has one leaf,
you just have to cut it, out of necessity. And then that little plant is going to
die.

For Josue, the need to earn enough to support one's family trumped both discourses of
sustainability and the individual relations of care that he has cultivated with xate
plants.
CHAPTER FIVE: A Known Place

Care is not a panacea

This transformation of perspective might be read as a form of environmentality, of making new environmental subjects (Agrawal 2005), but without transforming the broader conditions of life and labor in the reserve. As much as caring for xate may be transforming perspectives and relations, and will almost certainly help ensure access to the resource in the future, it does not change the basic structure of work that requires men to work as independent laborers, trekking through the forest to cut and haul palm in large bundles loaded onto mules, motorcycles, bicycles and strong backs. The advantage, another Uaxactunero told me, is that whenever you have a free day, you can go out and work, and you'll see the money quickly. But, he continued, in the summer it's unbearably hot, and in the rainy season the paths are nearly impassable with mud. It's difficult physical work, entirely dependent on uncertain international markets, and work that is heavily gendered.  

Those women who were hired to work in the selection facility? Their work involves mostly sitting around unpaid, waiting for xateros to come back from harvesting in the afternoon with bundles of palm, at which point they work in short, ten minute bursts of sorting. The women separate marketable from damaged, too small, or discolored leaves, then report the totals to both the xatero and the facility supervisor, who records them in a monitoring log. The selectors, like xateros, are paid by the leaf, and on a good day they might earn between 25 and 30 Quetzals ($3-4),

50 People say that there used to be xateras, female harvesters, but nobody could tell me exactly when or why women stopped harvesting xate, nor think of any woman currently living in the community who ever cut xate.
compared to the 600 to 800 Quetzals ($75-100) that a xatero can earn in the same day. Even the packers – also men – who work alongside the selection women, trimming and rolling up bundles of xate after they have been sorted, are paid more than twice as much per leaf. The women’s work is by no means hard, and there are few other opportunities for paid employment for women, but to sell these meager earnings as a great gender-equality benefit is hard to swallow.

And while the possibility of earning over $75 for a hard day's work can seem like an extraordinary opportunity in a place otherwise devoid of income sources, the precarity of this income – especially considering factors like global markets or external supports – should not be underestimated. While the global commodity chain into which xate is sold currently operates in a regular, structured way in Uaxactún (OMYC has contracts with mid-level distributors who transport the palms by truck to Guatemala City, at which point they are flown around the world), the overall structure of this supply chain and the U.S. and European floral decoration markets upon which it relies are inherently unstable and precarious. There are many points of vulnerability along this chain, a change in any one of which could undermine this vital source of income for Uaxactuneros – for example, there have been increasing attempts to start xate plantations in other regions of Guatemala, where the palm is grown under artificial shade to replicate the forests of the Petén. If these become successful, they may undermine Uaxactún's xate sales through direct competition or via ecological claims to provide the plant without harm to protected forests.
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Most significantly, the future consumer market for the palms is unpredictable in terms of potential shifts in valuation or demand. Chicle, the former heart of Uaxactún's economic activity, is instructive in this regard: extraction of this single resource deeply influenced the social and ecological formations of the entire Petén region for centuries, but a sudden drop in market demand in the 1970s collapsed most of these formations (Schwartz 1990). Xate may have replaced this natural rubber in local forest labor identities (xateros instead of chicleros), but the regional system in which this older extraction took place has also disappeared. Now, the individualized risk and reward of NTFP extractive labor are no longer an exception on the global scene, but are a part of the constitutive combination of "self-exploitation" and "superexploitation" that drive global supply chain capitalism (Tsing 2009). Combined with these changes in global political economic structures, the declaration of the Maya Biosphere Reserve in 1990 shifted state and NGO priorities in the region towards conservation, a position fundamentally at odds with extractive economies.

Uaxactún's geographic marginality places them at an advantage in terms of these new regional priorities to preserve forest cover – protected as they are by poor road access and the buffering effects of Tikal National Park – but at the same time undermines many possibilities of improving access to basic goods and services. The village still lacks reliable drinking water, electric, or communication infrastructure, all of which are tightly constrained by protected area regulations (a single landline serves the community, although a recent project brought satellite internet access to the local school). Uaxactún's concession is more than halfway through its 25-year
contract with the state, and despite recent praise for its forest management practices, the threat of losing concession rights, or even being evicted from the area, is strongly feared within the community (Zetina Tún 2011). OMYC documents also point to a lack of political or legal security with changing national governments; lack of political will on the part of various state agencies to uphold their end of the concession contract; neoliberal trade agreements that undermine local rights; lack of market regulation for many of the forest products produced; petroleum interests; and other serious threats to the concession (OMYC 2009). At multiple interlocking scales, vulnerability and precarity dominate.

Temporary solutions and improvements, including the xate enrichment and extraction activities detailed here, are deeply subsidized (as well as supported in non-economic ways) by NGO projects, which are themselves constrained by short term funding cycles and global institutional priorities that may have little to do with local needs. While the Guatemalan branch of WCS enjoys considerable programmatic freedom from its global head office in New York City, the contradictions between the organization's driving biodiversity conservation mandate and efforts to integrate local social, political, and economic concerns are many. Even at the level of maintaining its daily operations and institutional structure, WCS must prioritize extensive studies, project writing, assessment and reporting activities, and other work that has little to do with local people. The uneven dynamics of knowledge production, and the recognition that "reporting back" to local actors is also a generative activity for future NGO funding, are exemplary in this regard. These contradictions are deeply familiar
to those working in WCS and other NGOs, but recognition of these limitations is not the same thing as transformation. Juan Castellano's recognition of the difference between official project "success" (valuable to the institution and its donors) and actual positive outcomes on the ground begins to ameliorate this tension, especially since this recognition shapes his work and decisions in the village. But this itself is a precarious, tenuous intervention, reliant on the social skills and political judgments of a single individual who is ultimately unable to change the power relations in which he too is embedded.

Bringing the concept of care into my analysis allows a recognition of efforts to ameliorate the situation of marginalized people and environments on multiple scales while simultaneously recognizing the embedded contradictions and structural limitations to these efforts. If care is a striving towards something better, without assuming that an ultimate goal or solution will be reached, then WCS's xate projects indeed fit the definition, working as they do towards sustainable shared human-non-human futures. But overall, these xate projects might best be described by the phrase oft used by Donna Haraway: they are necessary, but not sufficient (Haraway 2008). While the projects do run in parallel with a strong emphasis on education initiatives aimed at getting kids out of Uaxactún and forest labor in the future, they are ultimately more concerned with the permanence and well-being of the plants than the people.

This case also shows how is essential to consider care ecologically – that is, at multiple scales and embedded within complex and contradictory relations of power.
By attending to the interplay of knowledge, power, and material practice at multiple scales, it becomes possible to see the ways in which care emerges at particular scales and relations, but not others. Care makes it more possible to live in the absence of fundamental changes in the political, social, ecological, and economic marginality of Uaxactún, but it is this exact same extension of possibility that means care is never enough. Conversely, close attention to both the material practices and embedded values of care is useful for not disregarding these and other conservation and development projects as simple extensions of the broader structural status quo. Care is a striving, a concerted movement towards something a little bit better, if not an ultimate good. Like Josue's affectionate attention to the health of wild xate palms and ultimate prioritization of his family's food security, the contradictions of conservation and development contexts are inescapable. And like Josue, finding ways to care even when faced with these contradictions is an essential form of striving, a striving mirrored by WCS in its projects even as it is undermined by the many other external political and economic forces shaping life, livelihoods, and ecologies in Uaxactún.

**Conclusion**

Changes in Uaxactuneros' identities, senses of place, and livelihoods are being driven in large part by the dynamics of external monitoring and study, part of a broader dynamic of knowledge-extraction and NGO intervention that shapes villagers' understandings of who they are and where they live. Rather than a strict contrast between "local" and "external" knowledges, studies about Uaxactún – its
people, priorities, or plants – are always constructed out of the relations between villagers and institutions or researchers, with "official" or "scientific" knowledge relying heavily on local experiences and stories (and only sometimes recognizing this fact), and vice versa. More important than the content of any one study is the way in which this constant monitoring reinforces the village's place in regional institutional and global environmental orders, and brings into daily relief its marginality in networks of capital, knowledge, and meaning.

The intensity of external monitoring and knowledge production in Uaxactún have become a mundane – if not always uncontested – part of daily village life, and the practices and outcomes of these studies have effects that range far beyond stated research goals. Xate quality monitoring is based on a strange calculation in which marketability stands in for ecologically sustainable field harvesting practices, but its ongoing presence in the village has been key to transforming local plant-human relations. The Basic Necessities survey is intended to measure NGO-led transformations, rather than trigger them, but its results end up raising new questions, problems, and sites for further study and intervention. Both cases are tied into Uaxactuneros' omnipresent awareness of having no control over the questions and terms of studies being carried out, reinforcing the identity of the village as an externally-known place.

Uaxactuneros do not necessarily know any more or less about their village and forest than outsiders, but they do know it differently. In WCS’s ecological monitoring presentation to OMYC, the presenter walked through data on the
measurement of seed trees left for regeneration in parts of the concession harvested in past years. She described various scientific measures of tree health, while discussing how the trees – individually mapped with GPS coordinates – were almost impossible to locate without the help of a villager who had worked the timber harvest of that particular forest patch. Despite the supposedly universalizing measure of GPS points and maps, lived, experiential knowledge was here a necessary complement to externally standardized official knowledge. And if there is one thing that is being particularly well developed as local skill and knowledge, it is knowledge of how to properly answer a survey.

This dynamic of constant study and monitoring of all aspects of life is perhaps not particular to Uaxactún – it happens everywhere, in different ways – but the visibility and local awareness of this dynamic, combined with the marginality and differences in power and access between extra-local knowledge producers and villagers, strongly affects people’s ideas about who they are and their place in the Maya Biosphere Reserve, the Petén, and the world. There is much frustration over the amount of study leaving the community and so few direct benefits coming back in. Still, although work is hard to find, local economies are dependent on global markets and extensive certifications, and people are burdened by debt at the household, community, and national levels, most people are relatively content in Uaxactún, and happy with where they live. It is, after all, beautiful, and there is always xate to keep one’s family afloat. The surveyee who told me that Uaxactún was the pulmón del mundo, after an extended rant about Uaxactuneros paying for global problems,
returned to the same image for comfort, sighing in resignation: “At least we breathe good air, here in the reserve.”
Sitting atop an ancient temple at sunset in the pre-classical Maya city of Mirador, a friend and I swapped stories with our local guide, outdoing each other with increasingly strange details of the fight over the ancient city’s future. Our stories turned to a well-known and respected American archaeologist who has studied Mirador for over 30 years, Richard Hansen, who is locally notorious – not for his archaeological findings, but for his scientific claims about a geological basin surrounding the site, and his support for a redrawing of the boundaries of the northeast corner of the Maya Biosphere Reserve within which Mirador lies. Our guide, a resident of the nearby village of Carmelita, told us entertaining tales of the rumored hidden motivations behind Hansen’s scientific and political beliefs – stories ranging from wanting to construct luxury hotels in the jungle to desires to build an enormous, illegal personal collection of Maya artifacts. I traded back rumors that I
had heard in other contexts, while my friend – always up for a good conspiracy story – joined in with wild speculations about worldwide Mormon networks and Hansen's religious drive for domination. Conspiracy theories like these swirl around conflicting scientific claims about the forested landscape that stretched out as far as we could see in every direction. At Mirador, rumors and paranoia are as deeply entangled with scientific controversy as the vines and roots of the forest are with the abandoned Mayan cities that lie beneath them.

The ancient city of Mirador is located in a National Park tucked away to the north of the reserve's multiple use zone, and while there are archaeological debates about the significance and interpretation of Mirador's history, the primary controversy has formed not around archaeological remains but rather around the geological shape of the landscape on which it stands. The site is at the center of a raging scientific and political argument over the existence of a geological basin (*cuenca*), and people ranging from poor local villagers to members of Guatemalan congress to Mel Gibson, Arab Sheiks, and representatives of the UNESCO World Heritage Program line up on one side or the other. While both sides draw on conservation rhetoric, arguments over the presence or absence of a basin define struggles over the region's future, with different visions of the landscape competing for legal, social, and economic control over the Northwestern corner of the reserve. The existence of a basin is used to argue for a redrawing of boundaries inside the reserve, creating more strict park-like protected areas while removing large tracts of land from current forest concessions. Those who deny the existence of a basin support the concession model, particularly
community concessions like that managed by Carmelita, which stands to lose the most land if the basin lines get drawn. The national election and government transition of 2011-12 re-enlivened this controversy, which has been ongoing for many years, and heightened rumors of hidden agendas and secret dealings that circulated on both sides of the fight.

_Conspiracy and Science_

Usually, when conspiracy theory and science appear in the same sentence, it's in reference to some kind of anti-science "wackos" trying to deny climate change (Lewandowsky et al. 2012), or to the ways that science can help you prove or disprove conspiracy theories once and for all. But in this remote Northeastern corner of the Maya Biosphere Reserve, the intertwining of scientific controversy, political conflict, and paranoid rumor-whispering challenges this framework of rational science vs. irrational paranoia. Science is always political, and in the Mirador basin controversy – as in many parts of the world – speculative storytelling and conspiracy theories are a primary mode of doing politics. In this controversy, rumors, gossip, and conspiracy theorizing create and reinforce social, political, and scientific alliances, and also enact coherent and powerful epistemologies through which scientific data and evidence are filtered.

This chapter returns to the themes of instability, violence, and non-transparent powers that shaped the mapping of _gobernabilidad_, but centers less on the production

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51 Two industrial forest concessions would also lose territory under a basin-ist rezoning, but these losses were not usually raised in debates over the area, as both sides were more focused on representing themselves as providing benefits to local communities.
of knowledge than fights over its interpretation and assessments of evidence and "truth." Conspiracy theorizing – storytelling that refers to deliberately hidden coordinated actions with nefarious motivation – offers those embroiled in this controversy a way to see clearly through these unstable dynamics, contradictory evidence, and uncertain futures. Elite and military domination, rampant corruption, and uncertain responsibility for current and historical violence all contribute to a political landscape in which conspiracies do take place, and paranoia is both a reasonable epistemology and a practical political strategy. Here, the paranoia, rumors, and fears of a hidden reality are inseparable from scientific knowledge claims, not an opposing social field for science to battle. In the case of Mirador, and throughout the Maya Biosphere Reserve, paranoia is not a pathological context in and against which scientific reasoning must work. Instead, Mirador unsettles the normative assumption that paranoid conspiracy theory and science are antipathetic, instead showing how the two are deeply entangled ways of determining truth on a politically fraught landscape.

**Mundane Conspiracy**

The words "paranoia" and "conspiracy theory" call to mind pathological extremes, the fearful fantasies of the lunatic fringe. These tendencies are typically placed in opposition to science or rationality, but recent scholarship has marked the move of conspiracy thinking from the extremes of society to a more mundane place at the center of political thought (Marcus 1999b; Stewart and Harding 1999). As George Marcus argues, paranoid thinking can, in certain contexts, be: "within reason, a
'reasonable' component of rational and commonsensical thought and experience" (Marcus 1999a). Following Marcus and others, I use paranoia to refer not to individual pathologies, but rather to a mode of political thought borne of social contexts in which suspicion of hidden dealings is a perfectly reasonable response. The term denotes a particular style of politics characterized by "heated exaggeration, suspiciousness, and conspiratorial fantasy" (Hofstadter 2012:3), and indicates a lack of clear limits around what is too extreme to be true, undermining straightforward relations between evidence and belief.

Conspiracy theorizing, a particular form of paranoid storytelling that posits deliberate, coordinated, hidden action, can be considered in two overlapping ways: first, in its epistemological and hermeneutic logics, seen through the content of the rumors and stories; and second, through its political action and effect, related to the contexts and ways in which these stories circulate. While always linked in practice, analytically teasing these subtle differences apart illuminates different effects of conspiracy theorizing: the contents provide powerful frameworks to explain the hidden workings of power, drawing attention to non-transparent political forces, practices, and exclusions (Butt 2005; Nelson 2009; Stewart 1999); while the circulation of the stories draws tellers and (receptive) listeners together in the pleasures of mutual trust around a shared secret, forming or reinforcing alliances through stories that provide clear markers of us/them, right/wrong, and truth/lies (de Vries 2007; Soares 1999; Wynne 1992). Current literature tends to focus on either one or the other of these aspects, but as the controversy around Mirador demonstrates,
epistemological and social-political effects should be read as the warp and weft of rampant paranoia.

In terms of their content, conspiracy theories are flexible, powerful explanatory tools, "born of a world that cries out for interpretation" (Stewart 1999:16). Contrary to common assumptions, conspiracy theories provide a more clear explanatory framework, not less, and are able to coherently contain contradictory statements or events by using paranoid leaps of logic (Marcus 1999a). Writing about apocalyptic thought in the United States, Stewart and Harding argue that conspiracy theories explain the contradictions, catastrophes, and excesses of (post-) modern life, while offering a return to an (imagined) simpler, stable truth: "Reason fails to explain events or to provide means for minimal predictability, which leads to a distrust of 'the reasonable' and a search for an alternative epistemology" (Stewart and Harding 1999:294). At Mirador, clashing scientific data are one such contradiction, and the turn to conspiratorial reasoning provides a clear route through the inconsistencies.

In their content, conspiracy stories point to the hidden workings of power, exacerbated in contexts of extreme inequality, violence, and non-transparency like Guatemala. Diane Nelson writes that post-civil war Guatemala is characterized by fears of duplicity, "that there is someone behind the scenes, pulling the strings" (Nelson 2009:xvi). These fears are driven in part by the "two-facedness" of the 36-year war in which the state killed or disappeared over 200,000 people, in which people were forced into complicity with military action via mandatory civilian patrols, and for which historical impunity is still the norm (Nelson 2009). In addition,
opaque and highly unequal government regimes are ripe for the development of
cracy stories that illuminate those aspects of power (Butt 2005). Guatemala’s
eous land, economic, and ethnic inequalities and non-transparent national
itics dominated by an elite and military-backed oligarchy further heighten these
arotic conditions. Thus, while paranoid politics and conspiracy theories occur the
world over, in Guatemala these forms of thinking move from the margins to center
stage, becoming a dominant mode of understanding power and politics.

In addition to exposing the hidden workings of power, the circulation of
conspiracy stories works to establish and reinforce social, political, and institutional
entities and alliances. Beyond their explanatory power, Brazilian anthropologist
Soares argues that paranoia has major political utility in situations characterized by
violence, particularly state violence:

When trust in institutions, in the action of others, in the effectiveness
of the morality in force, is undermined, when expectations are shaky,
conditions are favorable to the exploitation of conspiratorial theories,
to active or preventive conspiracies – even, I insist, if only to stabilize
[institutions] again. Or, conspiratorial paranoia is part and parcel of the
process of stabilization of expectations, creation of legitimacy,
consolidation of identities (Soares 1999:226).

In a similar vein, Kirsch (2002) notes that rumors about state violence in West
Papua not only reflect, but also reproduce, conditions of terror and repression.
Importantly, his analysis relies not only on a reading of the content of the
rumors, but also of where and when they travel – it is the appropriation and manipulation of rumors by the Indonesian state that amplifies their violent effect (Kirsch 2002). Finally, there is an important aspect of pleasure and performance involved in the telling of political rumor, one which consolidates authority and political identity in the teller (de Vries 2007; De Vries 2002).

These and other works collectively point to the importance of attending to not just the contents of conspiracy theories, but also their contexts, and in the case of Mirador the effects of paranoid rumors’ circulation extend beyond the social and political into the realm of scientific evidence and authority.

Science and Paranoia

Examining the most well-known case of controversy and conspiracy theorizing within science – global climate change – Myanna Lahsen finds two opposing material-political-scientific camps, with accusations of conspiracy and deliberate scientific mishandling flung in both directions at the "other side" (Lahsen 1999). In this case, the coherence of conspiracy theory offers a consistent account that cuts through the often undecipherable reality of scientific and political processes: "Charges and suggestions of conspiracy spread with little resistance among sympathetic audiences in a social and scientific context characterized by uncertainty, fragmentation, complexity, and competing interests" (Lahsen 1999:133). Lahsen's work analyzes conspiracy beliefs as "one tactic among many" (1999:133), highlighting their efficacy as a tool in a context of controversy and political disagreement. Her analysis centers primarily on conspiracy theories as an evocative
"style of argument" (Lahsen 1999:113, echoing Hofstatder’s classic essay), reflective of and reinforcing networks of trust, shared interests or worldview, and oppositions based on mutual dislike. The parallels with Mirador in these aspects are striking.

But to push this analysis further requires taking paranoid thinking seriously – not just as an argumentative or political style – by looking to the ways that conspiratorial and scientific thought are deeply entangled in practice. When people are embroiled in a politically heated controversy founded on contradictory scientific claims, conspiracy stories become not just "tactics" but also epistemological frameworks through which any new data will be filtered. Brian Wynne’s analysis of conspiracy-science stories circulating among Cumbrian sheep farmers reflects this: "The farmers thus embedded their reading of the present scientific claim … firmly within the context of the unpersuasive and untrustworthy nuclear institutional body language which had denigrated them for thirty years or more" (Wynne 1992:291, emphasis added). While Wynne’s argument centers on social identity and power-laden difference as key to determinations of fact or fiction – a focus which does not align as neatly in the Mirador case – his emphasis on conspiracy stories as interpretive, not just political, tools, is an important addition to Lahsen’s analysis.

In my analysis of the basin controversy, I aim to bring these two aspects of conspiracy theorizing together, showing how conspiracy stories circulating around Mirador establish strong political-scientific networks that divide neatly into two sides, while simultaneously structuring the lenses through which data and scientific arguments are read. In Latour’s classic framing of actor-network theory, both human
and non-human allies are enrolled in ever-evolving networks, which when large enough stabilize and take on the appearance of fact, nature, or truth (Latour 1987). At Mirador, the telling of paranoid rumors and conspiracy theories – the political style – is a key tactic in recruiting human and institutional allies into such networks; but in addition, the pre-figured clarity of truth and deliberate falsehood indicated by these stories shapes the reading of non-human actants such as maps, satellite imagery, or biodiversity surveys, determining their enrollment or exclusion from pro- or anti-basin networks as well.

**But is it a Basin? The Makings of a Strange Controversy**

There is good reason for people to fight over Mirador – it is, without question, an exceptional place. The site is accessible only by five-day guided hike, or, for those with the means, by helicopter. Making the trek to see it for myself was one of the last things I did after 14 months of research in the Petén, a capstone to a year of hearing public arguments, secret stories, scientific explanations and political pleas circling around the ancient city. I finally saw for myself the impressiveness of this last stretch of the Maya Biosphere Reserve's jungle not permanently inhabited or harvested by humans, the astounding ubiquity of ancient Maya traces dating back further than 1000 BCE, and the enormous temples and pyramids jutting up above the flat forested landscape. But even from atop *La Danta*, the Western Hemisphere’s largest pyramid towering above the canopy at over 230 feet tall, I still could not see for myself the "obvious" geological shape of the landscape that I had been promised would be
clearly visible by people on both sides of the controversy – I could not see either the presence or absence of a "basin".

A geological basin seems a strange thing to fight about. One side of this controversy, led by American archaeologist Richard Hansen and his NGO FARES (Foundation for Anthropological Research and Environmental Studies), claims that the area around Mirador is a geological basin, and they use satellite data to prove it. An image published in National Geographic in 1992 circulates as a key figure on this side of the argument, showing the different infrared signatures of vegetation types.

**Figure 6.1 Image from Stuart (1992), sent to me by a basin supporter with the note:**
“[satellite] imagery has entirely driven the identification of the Mirador Basin, and subsequent ground truthing (hydrology, soils, geology, etc.) have verified the observation.”
The borders of the Maya Biosphere Reserve are outlined in white, and the blue/black region near the top-center of the reserve indicates the suggested basin.
based on photosynthetic activity (figure 6.1). Basin-ists claim that red areas show relatively "high & dry" forest, while blue-black areas show low, swampy *bajo* forests. A neatly delineated dark blue area, they argue, shows that water is clearly pooling in this region, indicating a basin. This evidence is met with flat out denial by anti-basin-ists, who include the majority of conservation and development NGOs (including WCS) and community organizations working in the Maya Biosphere Reserve. Those on this side of the argument claim that vegetation is not true topographical data, and that the National Geographic image shows forest types, not elevation. Instead, they provide elevation maps based on data from NASA's Shuttle Radar Topography Mission (SRTM) program, which show steep rises on the southern and eastern edges of the same region, but then a gentle slope off towards the western wetlands of the reserve, without a secondary ridge to form a basin (figure 6.2).

*The Stakes of a Simple Scientific Divide*

Why does the precise shape of what is overall a very flat landscape matter so much to so many people? The basin boundary does not line up with the borders of the parks and concessions of the MBR that were designated in 1990 – and basin-ists want to redraw the map. This revision of territorial limits is based on the argument that the basin forms an important geophysical barrier, one that shaped a regionally unique biodiversity and the cultural formations of pre-Classic Maya civilization. Efforts have therefore been made to either change current boundaries inside the reserve, or to lay down a new, additional protected area on top of them. While it seems odd to layer protected areas over each other, one law was passed in 2002 to do just this (later
struck down as unconstitutional by the Supreme Court), and another was proposed to the Guatemalan Congress in 2010 (figure 6.3) (Escalón 2012). Redrawing the lines would take away land use and forestry rights from numerous concessions in the reserve's Multiple Use Zone, notably several community concessions that have deep histories living and working in the forest. Of these, Carmelita is not only the concession that will lose the most territory if the basin lines are drawn, but is also the

Figure 6.2 Elevation image of the Petén. The Mirador region shows a gentle slope to the west, rather than a basin.

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village closest to Mirador, serving as the launch point for most tourist ventures into the ruins. As such, this end-of-the-road forest community with less than 500 residents has found itself at the heart of the controversy, caught up in shifting scales of conspiracy theory in which it is alternately a pawn and a key actor.

Hansen and his allies – who include notable people such as Mel Gibson and former Guatemalan President Oscar Berger – have no problem with the redistribution of land rights and access inherent in their model. This side favors a more strict, park-like protection that severely restricts human use of the forest, and argues that the tourism brought in by properly developed archaeological sites would provide an
economic alternative for local communities. Opposed to this vision, a wide variety of NGO and community actors line up against the basin, supporting the current mixed-use model of the reserve and arguing that local economic benefit through sustainable forestry is the best way to protect the forest in the long term. Both sides produce satellite imagery and GIS maps to demonstrate not only the presence or absence of the basin, but also the success or failure of community-based conservation in protecting the forest – a question now inextricably (if illogically) linked to the question of topography. The fact that these contradictory visions of the landscape and conservation philosophy can both be demonstrated with empirical data works against local expectations that technoscientific objectivity might cut through the epistemic murk of post-war politics. These contradictions, then, are read as a clear indicator of political contamination of science, leading to accusations of purposeful mishandling.

*From the Village to UNESCO, Mirador Matters*

Swirling around the Mirador controversy are twisted tales of corruption and secret plans, in which scale-jumping is the norm. In these stories, discursive links are easily forged between deep history and present politics, between local decisions and global influences, or between events inside a small forest community and a presidential election campaign. Of course, there are actual conspiracies as well – politics in Guatemala *do* happen behind closed doors, in unofficial, informal, and often illegal channels, and through cliques of allied actors working to further their own interests. The 2011 election campaign was a high point for paranoia and conspiratorial thinking, with the choice between the two leading candidates
interpreted widely as a choice between bad and worse — Otto Perez Molina, tied to the brutality and duplicity of the civil war, or Baldizón, a charismatic business mogul whose quick rise to fortune and power lay at the heart of dark rumors in Petén.

Called "the Berlusconi of Petén" (Sas 2011), Baldizón has been accused of abuse of power through his vast media empire during the election, financial corruption, and links to both old crime families and newer Mexican narco gangs that influence much of the politics, land, and social world of the Petén (InSight Crime 2011). As Julian, a Petenero NGO worker, told me: “Baldizón… I despise him with all my soul.” I heard many stories about Baldizón's secret plans to change presidential term limits; people familiar with his meteoric rise to power in the Petén were sure that he had dreams of dictatorship. The inclusion of a development proposal for the Mirador "basin" in his Lider party’s populist right wing platform heightened these fears of conspiracy, manipulation, and deception among anti-basin-ists.

The division between those for and against the basin reverberates up and down social and political scales, from Congress to small communities. In addition to the laws proposed to Guatemalan Congress, attempts have been made to declare Mirador a UNESCO World Heritage site, although clear delineation of the site’s boundaries has stood as a major barrier to this goal. PACUNAM (Foundation for Maya Natural and Cultural Patrimony), an organization composed of elite representatives from Guatemala's wealthiest corporations to "promote sustainable development through the preservation of Guatemala's natural and cultural heritage" (PACUNAM 2012), long threw its heavyweight support behind the basin model, but
in 2011 started to shift its alliances towards the NGO coalition who work against the basin, in particular to support the highly controversial capture of Mirador tourism by Carmelita’s forest concession.  

In 2010, this informal coalition – including WCS, ACOFOP (the Association of Forest Communities of Petén, a collective NGO made up of membership from all community-run concessions), Asociación Balam, and others – helped Carmelita negotiate a legal agreement with CONAP giving the village a semi-monopoly over hike-in tourism to Mirador. CONAP's 2010 Public Use Plan for Mirador-Rio Azul National Park (within which Mirador’s ruins lie) established that while any agency can arrange tours to the site, they must hire members of Carmelita's tourism board – managed and licensed by the concession's management cooperative – to serve as guides, mule-drivers, and cooks. This arrangement has been incredibly contentious. Many conservationists and community development workers celebrate this capture of the market as a small victory over Carmelita’s geographic and economic marginality, while tourism operators and developers decry the loss of "free market competition."

As the closest village to the ancient city, the now legally determined center for tourism to the site, and the forest concession with the most to lose from proposed basin-shaped rezoning, Carmelita, though comprised of fewer than 500 people, has

\[52\] While this shifting alliance is a fascinating story in itself, it was unclear whether Pacunam’s support would be permanently withdrawn from Hansen’s archaeological work and the basin model, or why this shift was taking place. One FARES worker suggested these elites might be "suspicious" or "envious" of Hansen because they were not being given the adoration or god-like treatment they desired. Anti-basin-ists were happy to attribute the change to the elites beginning to "see through Hansen’s lies." I was not able to secure an interview with a Pacunam representative who might directly answer these questions.
become a major player in debates about the future of Mirador. But even inside the village, where it would seem that people should easily align with the anti-basin camp that maintains the current concession extension, use rights, and this small pocket of pro-community tourist regulation, there is a small – but extremely vocal – dissenting group. The division between competing visions for the landscape has become entangled with old family conflicts, with a small group of Carmelita residents opposing the community benefit-sharing model of the cooperative, especially now that their ability to run independent tourism ventures to Mirador in competition with the cooperative's tourism council has been declared illegal. These families, as opponents rather than members of the cooperative, are more likely to work with and support the anti-concession basin, providing both sides of the controversy the ability to claim the support of local people.

An apocalyptic landscape

This tale of Mirador, in which knowledge and politics are forged together in an atmosphere of fear, suspicion, and rumor, is not simply a story of clever humans struggling over a passive nature-space. Recent work on human-environment interactions has drawn attention to the ways that landscapes are active, tangled human/non-human spaces, in which human exceptionalism is cut down to size even as the consequences of human action on the world are taken seriously (Raffles 2002; McPhee 1989; Haraway 2008; Zimmerer 2000; Tsing 2005b; Rose 2004). How does Mirador declare itself? What role do the ancient temples play in this struggle, the trees and the understory, the geology, the jaguars? The past, present, and future of the
CHAPTER SIX: But is it a Basin?

Mirador landscape are all contested, and people struggle to enroll each of these non-human players to their visions and versions of truth.

In one way, Mirador speaks through its refusals to be enrolled clearly in one side or the other of regional struggles – the landscape is not so clear in its topography, history, or ecology that it can sit easily with one or another conclusion, resisting easy definition. In another way, the ancient ruins hold an undeniable pull and power, standing as exceptional monuments to the power of both human and non-human forces. The immensity of the Pre-Classical Maya construction is astounding, beyond compare or easy description, while the ability of the jungle to erase and wind its way into this human past also astounds, making the human contribution seem at once inconceivably vast and insignificant. The ruins serve as an eerie reminder that while current discourse shrieks that this forest will be lost, we too will one day be erased. One NGO staff person who has visited the city many times over his years working in the reserve often referred to the "dark energy" surrounding the site, and spiritual experiences atop jungle-covered temples are common among Guatemalans and international visitors alike. Mirador is a landscape profoundly shaped by human presence, but one that resists human control and domination, physical or political.

Mirador and its Maya history also serve as potent symbols of environmental downfall and ruin, and are often used (alongside the controversial "collapse" of Classic Maya civilization several hundred years later) as an allegory for the ravages of hubristic landscape alteration and climate change. In a 2004 National Geographic film about Mirador, shots of "illegal burning" of the reserve's forests frame the film at
its opening and conclusion, providing a clear narrative connection to why the ancient city was depopulated in 150 CE. Featuring Richard Hansen's work and perspectives prominently, the film explains that Mirador was heavily deforested to provide wood for fires to produce lime, used to build the city's enormous temples, and that this deforestation drastically altered the ecology of the surrounding landscape and undermined the fragile Maya agricultural system (Townsley 2004). Although today's deforestation is entirely distinct – undertaken with different technologies, at different scales, and for different reasons – this ancient tale is overlaid with warnings about current expansion of human presence in the reserve, presented as once again literally burning their way through the jungle, heading towards the heart of the Mirador forest to destroy it anew.

Overlaying historical Maya depopulation with current narratives of environmental destruction and population growth is a powerful discursive strategy in the Maya Bisosphere Reserve. In Mirador debates, Hansen in particular is likely to draw on theories of Maya environmental overuse leading to catastrophic population collapse – a publicly popular but widely contested hypothesis of why Maya civilization abandoned the central lowlands of the Yucatan peninsula centuries before the arrival of Spanish ships. The allure of environmental disaster narratives about the ancient Maya is evident in the recent popularity of such works as Jared Diamond's Collapse (Diamond 2006) and Mel Gibson's Apocalypto (Gibson 2006), and shows up in many discussions of the current and future situation of the reserve.
These apocalyptic overpopulation/deforestation parables were further bolstered in 2011 by the circulation of Maya "prophesies" of the end of the world in December 2012, an interpretation of the Maya calendar wholly dismissed by Mayanist archaeologists but one which fed into broader cultural understandings of the landscape and its histories and futures. Recent research has also indicated that a major drought occurred across the lowlands at the same time the Classic Maya civilization disappeared (Gill et al. 2007), a factor easily placed in parallel with predictions of higher temperatures and lower rainfall across the region due to current global climate change. These narratives of fear and apocalypse collapse distinctions between past, present, and future, erasing the differences between cutting wood to burn lime for temples and clearing protected forest for drug-funded cattle ranching, or between a historical drought event and uncertain predictions of climate change's impact on the region. All of these extraordinary entanglements of human and non-human action on the landscape are generative of conspiratorial epistemologies, as Mirador refuses to cleanly align with one or another powerful vision of what it is, was, or might yet be.

**On the Hunt for Hidden Truths**

The tenor of this scientific and political controversy has grown so intense that the mere mention of Mirador sends people into a frenzy of activity, trying to figure out what hidden connections or interests each new actor brings to the arena, and how to counter the "threat" from the other side without knowing what that threat might consist of, nor whether the "other side" is even involved. In this controversy, a single
word or name can set off cycles of rumor, gossip, and conspiracy theorizing that circulate through casual conversations in the hallways of NGO offices, in the cabs of pickup trucks, in skype chats between GIS technicians, and between tourists and guides at the tops of temples in the ancient city itself.

Among his opponents, the purported goals of Hansen's secret plans are never quite settled. Rumors I heard ran the gamut from mundane profit-motives, to desire for social and territorial control over the area, to dark spiritual motivations. Many think his push for a basin has to do with the money he could make by developing the site for luxury tourism, while others suggest that this imagined payoff is just a way of enrolling other powerful interests to support his deeper goals – most often linked to religious motivation based on his Mormon faith. Although both he and the candidate deny it, it is widely believed among his opponents that Hansen has personal ties to the 2011 presidential candidate and runner-up, Manuel Baldizón, who introduced the 2010 basin-ist proposal to congress and around whom even darker stories of conspiracy swirl (Plaza Publica 2011). Through Baldizón, Hansen is linked to rumors of organized crime, drug trafficking, deep corruption, and ruthless power accumulation.

On the other side, pro-basin-ists accuse NGOs and their allies of promoting a fundamentally flawed model of conservation – community forest concessions in particular – for their own financial and political interests. Again, territorial

53 There is a long and controversial history of Mormon archaeology in Mesoamerica, although Hansen has never connected his own research to this explicitly religious legacy. For more information, see Sides (1999).
domination is a common theme: "there is a small group of power here … that wants absolute control over the [reserve]," one basin supporter, Julio, told me. He continued by telling me that someone from an anti-basin NGO had told him that he continued to work in the Petén because this group "allowed it," insinuating total (potentially violent) control over the region. Accusations against these NGOs include corruption (paying off state actors) and unlawful accumulation of profit and power. Another of Hansen's supporters counseled me conspiratorially to keep a careful eye on WCS in particular as I carried out my research with them with: "Just look at what they do, ignore what they say, and you'll see the truth."

This search for hidden truth is at the heart of conspiracy theorizing. In the Mirador debate, not only does fear and rumor dominate, neither side takes the other's scientific or political position as honest "truth." Discussing Manuel Baldizón’s campaign proposal for development of the Mirador area, one NGO worker asked: "What do they get out of supporting this law? Well, part of it is the community development, development of Petén and tourism, conservation stuff, so they look good and get their name in there... But what are the hidden motivations?" Readily apparent explanations of conservation, development, or public prestige are simply not good enough when Mirador is at stake. Instead, differences in scientific data and conservation philosophy are interpreted as hiding the true nature of the other side's nefarious interests.
Doing Paranoid Politics

The circulation of conspiracy stories and rumors create and solidify the social, political, and scientific alliances that form on both sides of this controversy. Conspiracy theories always include the belief that people are being fooled into participation in something that is against their own interests (Cubitt 1989), a logic deeply mirrored by the prevalence of engaño (deception, duplicity) narratives in post-war Guatemala (Nelson 2009). Both sides of the Mirador controversy explain the enrollment of local, national, and international allies to the other side through this kind of logic. This explanation simultaneously enacts alliances on one's own side: the sharing of a conspiracy story creates a bond between teller and listener, marking both as on the right side of a moral and political divide and indexing unimpeded access to truth (Cubitt 1989). This comingling of political morality and "truth" is a powerful mixture in the Mirador controversy, where scientific and political arguments have become inextricably entwined. As a result, paranoid rumors here are not just "one tactic among many" (Lahsen 1999), but a dominant form of political action.

Conspiratorial Politics from National to Local

As stories about Baldizón and his dirty dealings ran wild during the 2011 election season, their occasional intersections with Mirador rumors provided rich fodder for conspiracy theories. While Richard Hansen publicly denied any connection to Baldizón and his Lider party, rumors of their alliance (ranging from financial contributions to secret phone conversations) were only fanned by these denials, with both men seen by their opponents as manipulative, dangerous, and powerfully well-
connected would-be destroyers of the Maya Biosphere Reserve. Baldizón’s proposal for the "basin" was eventually defeated in congress, but even with this victory members of the anti-basin coalition worried about retribution from the politician. It wouldn’t come immediately, they decided, but Baldizón is a "smart, patient man," one who remembers who has crossed him and bides his time before taking retribution.

These rumors were passed back and forth between two staff members of anti-basin NGOs in a car ride shared with a tourism development consultant and myself as we headed out to a community event inside the reserve. The consultant, who had worked extensively with PACUNAM and FARES, was skeptical of the connections being posited between Baldizón and Hansen. The staff members piled on more evidence in response, such as a detailed analysis of language in the candidate’s proposal that appeared to be poorly translated word-by-word from English descriptions of the ruins. This conflation of poor translation with hidden conspiracy reveals the logic of these rumors: "what distinguishes the paranoid style is not, then, the absence of verifiable facts… but rather the curious leap in imagination that is always made at some critical point in the recital of events" (Hofstadter 2012:37). Beyond these rumors’ logics, the sharing of these stories in the private, convivial space of a shared pickup cab was clearly intended to enroll a new ally in anti-basin politics.

Within Carmelita, a similar atmosphere of suspicion and rumor animates village-level politics. Fights between the concession's management cooperative and the village COCODE were shrouded in conspiratorial rumors, with regulation of
tourism and access to Mirador among the hottest issues. In the run up to a COCODE election in late 2011, the cooperative's board of directors and an anti-basin NGO representative strategized in a closed-door meeting about how many days in advance to announce the election assembly in order to prevent "the other side" from having too much time for counter-campaigning, organizing, and "manipulating" other community members. This planning meeting was not perceived by those taking part as manipulation or conspiracy, despite being hidden, coordinated action designed to swing the election towards their own interests. The political alignment of the opposing faction with Hansen and against the cooperative, as well as against broader community-based conservation discourses and NGO interventions, marked the opposition's actions as based on lies and manipulation for personal gain. In contrast, the meeting was seen as strategizing not for the individual interests in the room, but in defense of the broader community and forest. This kind of pre-emptive activity simultaneously drives and is driven by the paranoid gossip that builds into full-fledged conspiracy theories, as this meeting designed to cut off the opposition's secret plans will only inspire more rumors from the other side, deepening divisions between them.

*How I Came to Conspire Against the Basin*

I too am entangled in the dynamics of paranoia and rumor at Mirador, conditions for my own knowledge production. Each side of this controversy allowed me access to their knowledge and stories out of the desire to have me see the clear "truth" of their side, while also limiting my access out of fear that I might be hiding
my own secret alliances. I was told at one point that there had been careful discussion about whether or not I should be allowed into a particular meeting, a discussion that ended with the conclusion that I was "probably not evil." But rather than uncover a clear and final truth (though I am more convinced by non-basin data), I too was enrolled into an anti-basin political position by stories and rumors. While partially due to my preference for community-based conservation (which, while far from perfect, I find more realistic and equitable than strict park-like protectionism) by the time I encountered the basin-ist position and evidence directly I had already been turned against them by months of building social ties with WCS and other anti-basin NGOs. These ties had been solidified by stories, gossip, and rumor about basin-ists and their true motivations – stories which I myself later turned to similar political effect.

Less than a month after returning from Guatemala to academic life at UC Santa Cruz, I received an email from an anti-basin conservationist: "Hi Micha, Can you please read this email and give us your take on this?" What followed was a forwarded string of messages from a "governance consultant" who was asking about Mirador, and who would be meeting with the UCSC Environmental Studies Department to discuss research funding on behalf of some unnamed "friends." My NGO contacts were afraid that Hansen's "hidden hand" was "yet again attempting to plant a seed with a reputable institution to raise their personal profile and line weighty institutions up behind their cause," and asked me to investigate. I managed to get myself invited two days later into a meeting between an academic department I don't
belong to and the consultant, who turned out to be the representative of a sheik from the United Arab Emirates.

The sheik and his daughter had been given a helicopter tour of Mirador by Hansen and had fallen in love with the area, but this consultant had gotten a "bad smell" off of Hansen's request for millions of the sheik's dollars. Instead, he had turned to UCSC looking for alternative ways to invest in the region. In the meeting, after tentatively feeling out the consultant’s connections, I suggested that he direct research funding through both UCSC and the NGOs and community coalitions that line up against the basin. I was pleased to be able to support the organizations that had supported my research (at least potentially – the funding has not materialized), but at the same time felt uneasy at how I had been drawn into the same pre-emptive, backroom strategizing that I was writing about. Without the fear of Richard Hansen's secret dealings or my own circulation of gossip in the meeting, this potential alliance between a sheik, a U.S. public university, and the anti-basin camp of conservationists would never have been possible. Paranoid politics are thus highly generative – both of political connections and alliances, and of new knowledge: any knowledge about Mirador produced by this funding will be inherently inflected by the paranoia that shaped the possibility of that research.

Paranoid Evidence

These stories reveal how rumors and conspiracy stories are powerful tools for creating and solidifying political alliances. Through the lens of actor-network theory,
these two camps are enrolling human and institutional actors to their competing networks through paranoia and rumor-sharing, though in 2011 neither had yet grown large enough to overshadow the other and stabilize their scientific theory into "fact."

But what of the non-human actors enrolled in the scientific arguments – the GIS maps, satellite images, and biological surveys? When two scientific positions come into conflict in the Petén, the contradictions between them amplify the mundane paranoia that dominates political life, each side convinced that the other is intentionally manipulating or distorting their data. In fact, the more convincing the other side's evidence, the more convinced people become of hidden wrongdoings.

*Basin, Plateau, Landscape*

Richard Hansen and other supporters of the basin make strong claims to scientific support and evidence, including from scientists working in the U.S. Geological Survey, the University of Arizona, and Stanford University. But the infrared satellite image that serves as a central pillar in the basin-ist scientific camp (figure 6.1) is summarily dismissed by opponents: "a ring of healthy photosynthetically-active vegetation appearing seasonally around the Mirador region does not sufficiently determine the nature of the topography involved in producing such a pattern." In response, one basin-ist complained about ignorance of bajos, the forests that grow in swampy depressions and that appear blue-black in infrared images: "They always say, 'it's not a basin! it's not a basin!' … You know infrared

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54 Actors from these institutions remained in the realm of claims made in interviews and other conversations; I never saw firsthand testimony or evidence from these connections.
photographs [addressing me as a researcher of satellite imagery], it's bajo vegetation.

Now, water doesn't stand on a hill, it doesn't stand on a plateau, which is what [they’re] trying to call it … Let the vegetation tell you what's going on." Nonetheless, when faced with data based on vegetation vs. radar topographical satellites, anti-basin-ists stick resolutely to the latter.

Of course, basin-ists claim not only that a basin exists, but also that it delineates an important natural and cultural barrier – one significant enough to justify the redrawing of political boundaries. Specifically, they argue that many species are endemic to the basin, and that the most important sites of pre-classic Maya civilization are within its geological boundaries. One Guatemalan who had worked with FARES showed me on a map why current lines ought to be redrawn:

Scientifically, technically, biologically, there is no reason to have made a park like this. However, here there is a mountain range … which is what Richard Hansen calls "the basin." Actually, the majority of Maya construction is inside this. On this side [pointing west of the region] there are some [Maya sites], but not like here. Those same Maya used logic: they saw that there was a natural protection here, the mountains, the water runs generally in this direction [towards the basin’s center] ... It makes a lot of sense. Biologically, scientifically, the park should have been here.

On the other hand, the anti-basin-ists not only claim that there is no special geological feature here, but that the natural and cultural landscapes of interest are much larger and more complex. As one CONAP employee wrote in an email to other anti-basin-
ists: "the insistence on differentiating this from the rest [of the reserve] as extraordinary has no foundation … There are two archaeological sites there, more or less out of the ordinary only because of the size of the structures, but there is much more sophisticated and advanced Mayan art in other sites, so in reality it's just one of the many important things in the MBR."

*Competing Conservation Philosophies*

The two sides of this debate hold very different interests and beliefs in terms of conservation, with community-led sustainable forestry facing off against tourist-oriented parks. The gathering of technoscientific evidence to bolster each side’s position extends into this realm, with each side presenting data demonstrating the success or failure of the current management regime of the reserve. The basin side explicitly argues that there is no such thing as "sustainable" timber harvesting, and that community management in particular constitutes a threat to the future of the landscape. To this effect, they present a map of the area showing the accumulation of eight years of MODIS satellite hot spot data to indicate the presence of fires in the Maya Biosphere Reserve, creating a clear and terrifying image of a anthropogenic fire sweeping in from the unruly west (figure 4.4, in chapter four). Against this image, anti-basin-ists argue that overlaying many years of fire data creates an exaggerated sense of threat, erases the reduction of fires in recent years, and conflates the activity of illegal land invaders in Western national parks with the permitted, controlled agricultural fires of community concessions.
The anti-basin-ists, too, provide GIS maps and satellite data to back up their claims of the concessions as good conservation model, showing how most deforestation in the reserve has occurred in exclusive National Parks, with the concessions providing much stronger protection for forest cover and offering a buffer against further human migration towards the Mirador area (figure 2.8, in chapter two). Speaking back to this model, basin-ists point out that tree cover is not a good indicator of ecosystem health, and that the real impacts of logging concessions are invisible from the sky. In particular, they point to habitat fragmentation caused by logging roads, ecological depredation due to hunting and harvesting of non-timber forest products, and the prevalence of trash left on paths and in campsites by unconcerned locals.

*Reading Across the Lines*

What might be as simple as an argument between competing methodologies or types of evidence does not play out in these terms. Instead, the differences in scientific argument are attributed, on both sides, to deliberate deceit or manipulation: as a basin-ist told me, "most Peteneros will ignore or chose to ignore geographical truths in favor of political or economic expediency" (emphasis added). On the other side, an anti-basin NGO worker simply stated, "Richard still goes on about his false 'basin,' no matter what the science shows." These lines between truth and falsehood are declared as obvious and easy, the value of evidence being read through political and social alignment in a clear parallel to the conflict over global climate change as described by Lahsen (1999).
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Pushing this analysis further than a politically-structured system of belief, it is not simply the denial of evidence that matters here, but the imaginative imputation of nefarious goals that lie behind deliberate falsehoods, rumors which undermine the possibility of taking any future evidence at face value. At one point, an NGO staff member showed me a PowerPoint presentation he had assembled that systematically ran through copied images of the FARES website, highlighting and contesting individual terms, numbers, and claims running across all three aspects of the controversy (the existence of a basin, its significance, and the degree of conservation threat posed by current management). More than a straightforward refutation of scientific claims, this PowerPoint was presented to me as evidence of calculated deceit on the part of the opposing NGO, with each additional disputed claim adding to the weight of the deception – and therefore to the seriousness of what it might be hiding. Through the twists of paranoid logic, evidence for a basin thus becomes key evidence against a basin (and vice versa), as one's own evidence becomes increasingly solidified in the face of dangerous opposition.

This reading of contradictory data as a sign of powerful conspiracy demonstrates an epistemology that reveals more about the workings of power in Guatemala than it does about the topographical shape of the landscape. Importantly, one’s own data and evidence is never held to the same scrutinizing standard as the opposition’s, as there are no hidden deceptions to reveal and logical leaps in one’s own reasoning are accepted as unproblematic. For example, one basin-ist cited the discovery of 14 new species of moth in a three-year period as evidence for the
biological uniqueness of the basin. While these discoveries support claims for high endemism and biodiversity in the area, it does not demonstrate that these moths are not found outside the basin where no surveys were conducted. Similarly, Hansen’s Mormon faith was considered a potentially dangerous and important factor in his marshalling of data, while Mormon Guatemalans working in anti-basin institutions were left free of suspicion by their peers. Paranoid epistemologies are not only clear about the lines between truth and falsehood, they also impute "politics," dirty dealings, and logical fallacy exclusively to the "other."

**Conclusion**

In the Mirador controversy, conspiracy theories and suspicion are entirely reasonable, and are not just contextual to, but deeply entangled with practices of scientific interpretation and argument. There is an insistence on both sides of the debate on a single and knowable truth, something solid and discoverable that is being purposefully manipulated and obscured by the interests of the opposite side. In this controversy, scientific practices designed to present objective images about an external reality cannot be separated from the fearful context in which that science takes place. Dark rumors of dirty secrets like territorial control or plots for Mormon domination create the networks that bolster scientific facts, and are embedded within the frameworks through which people read data proving or disproving a basin. Conspiracy theory here is not anti-science, it is inside scientific understanding itself.
Science – with its promises of access to a clear and knowable reality – works hand in hand with conspiracy theorizing as a way to get a handle on the sheer out-of-controlness of life on an ecologically, historically, and socially complex landscape. Conspiracy theorizing draws together unexpected scales and stories, shapes political strategy, and also shapes the production and interpretation of evidence, drawing clear lines between fact and falsehood. Conservationists, scientists, villagers, and politicians come together in a world where daily violence and paranoid fantasy bleed into each other, and in which the circulation of conspiratorial stories is political business as usual. Out of the unpredictable shifts of multiple political, scientific, and ecological worlds, paranoid politics and epistemology emerge as a coherent and highly effective way of understanding and acting in the world.

Finally, it is essential to reemphasize that this dynamic of paranoia and scientific controversy is not an exceptional connection found only in this remote corner of Guatemala. All science is political, and conspiracy theorizing and paranoid gossip are common ways of doing politics around the world – Mexico (de Vries 2007), Italy (Wagner-Pacifici 1999), Venezuela (Briggs 2004), and the "global" sphere of climate change (Lahsen 1999) provide easy points of comparison. These responses to the excesses of reality are exacerbated by violent, unequal, and non-transparent contexts, and exist not only in spectacular displays of irrational calculation but in everyday, mundane conversations and understandings of how the world works. Conspiracy theories are powerful tools for making sense of contradictory information, and for providing clear explanations in situations that are
anything but; science, too, provides this kind of satisfying clarity and finality of explanation. Rather than contrasting irrational political rumor with logical scientific fact, or considering the former as simply context for the latter, the case of Mirador demonstrates how the two are deeply entangled and are, in practice, inseparable.
CHAPTER SEVEN

REDD+ Queen Futures

Aquí estamos, trabajando siempre

Conservation work is never done. While fundamentally a future-oriented project, conservation has no ends, no final goal, no ultimate success after which its practitioners can hang their hats, clap each other on the backs, and declare their work complete. In the Petén, the only success most hope for is to maintain enough forest to keep conservation as a viable and worthwhile activity. This is a fundamentally defensive position, one which keeps conservationists in a constant state of emergency and reaction—rather than planning ahead and strategizing for a long term future, conservationists watch for emerging threats to the forest, shifting and changing their strategies and alliances in response to an ever-shifting landscape. As such, conservation in the Maya Biosphere Reserve comes to look much like the dynamic
expressed by Lewis Carroll's Red Queen, who stated: "Now, here, you see, it takes all
the running you can do, just to keep in the same place."

In fact, conservationists might argue, keeping in the same place would be an
exceptional achievement. "Aquí estamos, trabajando siempre," people say (we are
here, always working). This phrase, and another, "siempre en la lucha" (always in the
struggle), circulate among people in the Maya Biosphere Reserve (conservationists
and local villagers alike), signaling resignation to this dynamic of always reacting,
always working, working hard, the struggle never ending. These phrases serve as an
appropriate way to end conversations with no end, to close meetings over contentious
project budgets that find no resolution, to acknowledge together the always
ongoingness of relations of work, struggle, conservation.

At the same time, futures must be planned: projects proposed, park
management plans written, climate change impacts projected. When people talk about
these imagined futures, it is with great skepticism; for any five-year plan, the first
year might be a real "plan," the second year a rough possibility if the first year brings
no major surprises, and the years beyond that a fiction directed at funders and
bureaucratic regulations. Instead of solid predictions, people work to build flexibility
and emergency funds into their budgets and projects. But this desire for flexibility and
ability to react to unforeseen futures clashes continually with the technocratic
rationality underlying NGO and state structures, as well as those of other major
international actors invested in the Maya Biosphere Reserve's conservation.
This final chapter turns to the unimaginable future of the Maya Biosphere Reserve, especially through a carbon credit project that requires precise technoscientific modeling of future deforestation in the reserve. This project, developed through the UN Program for Reduced Emissions from Deforestation and Forest Degradation in Developing Countries (REDD+), has been under planning and development since 2008, though at present no formal REDD+ project has been approved for the country. The length of the planning stage for this project – now in its sixth year – is largely due to the social and political tensions involved in determining legal rights to carbon stored in the trees of the Maya Biosphere Reserve and elsewhere in Guatemala. As presented by REDD+ project leaders, these political battles are entirely distinct from the GIS model of future deforestation, prepared by CEMEC, which sits at the heart of the project. This model is widely praised as a major technological achievement and a source of pride for project leaders, CEMEC technicians, and others, and yet few if any of these actors place faith in the model's predictions. Still, as I argue, this model works – if not as a source of accurate predictions, then as the source of new technical expertise, new alliances, new funding and investment, and new scales of imagination and response.

**Rejected Projections**

REDD+ is a speculative carbon market-based UN program designed to reduce deforestation in developing countries. The projects follow a three-step process of prediction, prevention, and sale of resulting carbon credits. First, REDD+ projects
must produce a statistically reliable prediction of future deforestation, like the GIS model developed by CEMEC for the Maya Biosphere Reserve. Second, actions must be undertaken to prevent some portion of this predicted deforestation from taking place. After a number of years, the difference between the original prediction and successfully “saved” forest can (theoretically) be sold as carbon credits on international markets, where prevented forest loss is counted as prevention of the release of those forests’ carbon stocks into the atmosphere. The conservation actions that reduce deforestation must be directly linked to an official REDD+ project, in addition to other forest protection activities; in other words, if deforestation turns out to be less than predicted but was due to business-as-usual conservation practice, this "success" is not tradable for carbon credits.

REDD+ is extremely problematic, and there are a huge and ever-growing number of critiques of the program (and similar payment for environmental services models) in theory and practice around the world. The program relies on the logic of the market to compensate developing countries for maintaining their forests (usually inadequately), while allowing richer carbon-emitting countries to buy these carbon rights rather than change their forest practices (Redclift and Sage 1998; McAfee 2012). This valuation of forests is also based on translating complex ecosystems with multiple functional and symbolic relations to human and non-human well-being into a new commodity, carbon, extending neoliberal and capitalist logics into new ecological realms (Milne 2012; Mahanty et al. 2012; Sullivan 2009; Sullivan 2013; Corbera 2012). In addition, the question of "property rights" over carbon content of
forests (including belowground biomass) is an incredibly complex one, especially in forests that are inhabited or managed by indigenous or other groups (Filer and Wood 2012; Dressler et al. 2012). These challenges have led to extended conflicts in many places, with the implementation of REDD+ projects often exacerbating existing inequalities while doing little to protect forests or other ecosystems over the long term (Fletcher 2012; McElwee 2012; Milne and Adams 2012; McAfee and Shapiro 2010). There have been efforts within the REDD program to respond to some of these critiques, including the addition of the "+" to the program's name to acknowledge the complex worlds of tropical forests that extend far beyond carbon content; as one Guatemalan NGO worker commented, “the ‘plus’ stands for ‘everything else’.”

These critiques all apply to the development of a REDD+ project in the Maya Biosphere Reserve, and conflicts over the direction of potential future payouts continue to prevent this project from coming to fruition, even after six years of development. There are continuing efforts to develop "pro-poor" REDD+ projects in a few different areas across Guatemala, but the Maya Biosphere Reserve's Multiple Use Zone is the largest of these, and one of the most contentious (another project inside the reserve is being designed for Sierra del Lacandón National Park, headed by the NGO Defensores de la Naturaleza that co-administers that park with CONAP). This particular project has been in planning and development for over six years, largely because of complex negotiations over who will obtain eventual rights to carbon credits. In the reserve's Multiple Use Zone, these rights must be coordinated between the state, which owns the land, and the industrial and community forest
concessions that manage and work its forests, but whose contracts do not include any language over carbon rights or payment for environmental services. Instead of adding to the many critiques about these political aspects of the REDD+ projects, however, my analysis here focuses on the technoscientific model of deforestation that forms the heart of this project in Guatemala.

**Boundary work and the Performance of Rigor**

People working to promote this REDD+ project clearly and repeatedly differentiate between the “technical” and “political” (legal-economic) aspects of the program. This is a familiar performance of “boundary work,” or drawing a strict contrast between science and politics in order to make the former available as a neutral decision-making tool for the latter (Gieryn 1983; Guston 2001). One example of this boundary work occurred during a formal presentation in late 2011 to a large multi-sector roundtable meeting featuring representatives of multiple state agencies, elected representatives, the police and military, Guatemalan and international NGOs, local community members, academics, and the private sector. In this presentation, the line between the technical and political aspects of the REDD+ project was so explicit that they were actually separated into two different PowerPoint presentations, prepared and given by different people from different institutions.

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55 These multi-sector roundtable meetings occurred every two or three months in the Flores area, and were organized around Mirador and its "areas of influence," which extended to the entire Multiple Use Zone. The polite public face of the Mirador basin controversy also played out in these meetings, which were an attempt to create communication and coordination between the myriad institutions working in the area.
The political side of the project, widely acknowledged to be much more difficult and slow moving than the technical side, was presented by representatives from the U.S.-based Rainforest Alliance (RA, which is key in developing REDD+ projects across Guatemala) and ACOFOP. Their presentation reviewed the process of determining the distribution of rights to carbon credits, as well as the legal and economic structures through which potential earnings from the sale of those credits would be filtered – both hotly contested questions. The number of interests and "stakeholders" to be balanced in these negotiations was overwhelming: there were the NGOs involved in the project (RA, ACOFOP, Asociación Balam, WCS, IUCN, PACUNAM, Defensores de la Naturaleza, and others at various points in the project's history), multiple state agencies and representatives (CONAP, INAB, MARN, municipal leaders, the governor of the Petén, and congressional representatives), and the many community and industrial management groups for forest concessions inside the project area. That these negotiations have been ongoing for years (especially when many of these groups and institutions experience conflict and divisions among their own members) is not surprising. The presentation to the roundtable attempted to present an optimistic picture of "making progress," but overall the legal and financial structures of the project remained hazy.

These issues were presented at the meeting as though they were entirely independent of the project's technical deforestation model, which was praised by the presenters from RA and ACOFOP as the most complex and well-designed model of its kind yet completed in Central America – praise which I heard repeated many
times, in many contexts. Following these NGO speakers, Victor Hugo Ramos stood up to begin his presentation to the roundtable on the technical side of the REDD+ project: a baseline measurement of carbon stocks in the forests of the project area, and the GIS model of predicted future deforestation. The former pooled data from multiple sources and studies to create a rich analysis of the carbon content of different forest types within the reserve, which Victor Hugo presented with the comment: “we probably have one of the richest databases for carbon stocks in the whole country.” But the model of deforestation was the real star of the show, with 16 PowerPoint slides dedicated to explaining the data sources and analysis put into the model, which was declared nearly complete.

The presentation of this data to the roundtable meeting was indeed extremely "technical." Most of the slides showed images of GIS layers, presented quickly and with little context or explanation other than a listing of data types and sources (figure 7.1). These slide images, with multiple sources of complex information and imagery, flashed one after another on a screen at the far end of a large meeting room filled with non-specialists. Victor Hugo's guiding commentaries were brief, dry, and generally emphasized the robustness of the various data, analytical tools, and finally, the resulting model (figure 7.2). Overall, it was clear that Victor Hugo's role at the roundtable meeting was to play out a Star Trek-like model of science, where an expert, armed with incomprehensible imagery and language, provides a solid image of expertise and technical mastery rather than actually communicating any technical content or ideas. This dry technicality was deliberate; when I asked Victor Hugo
Figure 7.1 PowerPoint slide demonstrating data sources and analysis for the REDD+ project technical model of deforestation, presented to a multi-sector roundtable meeting by Victor Hugo Ramos. The GIS layers represent urban areas, buildings, and road access, combined via proximity analysis in GIS to an overall measure of "human influence" (CEMEC 2011).

about this presentation following the meeting, pointing out the strangeness of the intensely technical details given the non-expert audience, he told me that this was explicitly requested by REDD+ project leaders: "I could have talked more about the process, the challenges, but they asked for this specifically.” His role was to simply present the model and its data, to provide a solid symbol of “science,” and to assure the gathered people that, despite its many political troubles, the technical half of the REDD+ project was running smoothly, and something to be proud of.
Despite these efforts at boundary work, the spatialization of the resulting technically-projected deforestation was still read in entirely political ways. A tourism development consultant, Sebastian, reacted to this model privately to me later, wondering if the data had been intentionally manipulated. “It struck me as surprising, as biased, and as really sad… If that’s really the road we’re on, all this effort to preserve the Maya Biosphere Reserve that has been operating for 22 years has been in vain, will be in vain.” This consultant read “bias” and “manipulation” into the model's map both because of the extent of deforestation predicted, and because of the spatial distribution of that deforestation — more in the parks and less in the community forest concessions. While the former was explainable by the strange logics of REDD+ projects (where the worse the future looks the more money you stand to make by
"preventing" it, encouraging the development of the worst case scenario possible within technical specifications), the latter distribution was directly opposed to Sebastian's pro-park tourism, anti-concession stance. He refused to accept a future in which the concessions were predicted to do so well against deforestation, holding deeply to the belief that local communities were fundamentally ecologically destructive.

The spatialization of predicted forest loss was also the source of dispute between representatives of different community concessions. Unlike Sebastian, these men did not challenge the REDD+ data or the model's validity, just its implications. At a REDD+ budget planning meeting between NGOs (WCS, RA, and ACOFOP) and representatives from the community forest concessions, the representatives struggled to reconcile their own interests with the logic of distributing funding based on CEMEC's technical projections. According to the spatial logic of the projections, certain areas would receive a much greater proportion of potential funding to go towards monitoring and control of their territory, in particular those concessions with borders along the buffer zone to the south, close to Laguna del Tigre National Park, or connected to the road to Carmelita that cuts up through the center of the Multiple Use Zone. But representatives from the "safe from deforestation" areas, those in the northeast portion of the reserve near the Belize border, saw this as unfair.

The ACOFOP facilitator running the meeting urged the gathered men to focus on “harmony” and “building a united front,” and asked them to mentally erase all of the lines between their concessions, and to simply focus on the larger project outline
(a red line marked around the edges of the multiple use zone). One of the men responded by asking Victor Hugo, who was present to show and explain the projections to the group, to "turn up" the red line around the whole project so the men could see it better; this was, of course, impossible on a static map image. Another suggested that such collaboration was doomed to failure: "we've learned how to fly, how to swim, but we haven't learned how to live as brothers." Here the conflict between concession and REDD+ project scales was clear, as the community forest managers repeatedly rejected proposals for budget allocation based on the projection model in favor of their own knowledge and experience. From their perspective, the threat of deforestation was inseparable from the financial interests of their own concessions, not a shared problem. A representative of one of the "safe" northeastern concessions commented, in reaction to the model's varied levels of risk and projected deforestation, “wherever there is a tree, there is danger of deforestation.”

The Unimaginable Future

This quote, while very simple, is very telling. It expresses a fundamental disbelief in the predictability of the landscape’s future, by technical or other means. This disbelief is shared not only by those who object to the political implications of the REDD+ deforestation projections, but by nearly everybody – including the lead developers of the REDD+ project. In fact, when I asked one of the CEMEC technicians who built the model — which he was very proud of — if the output
matched what he imagined the future of the landscape might look like, he replied, very quickly and resolutely, “No.” He continued:

I think it’s going to be much worse than the worst scenario that we’re considering. If things continue the way they are, and if in 30 years we’re where the model says, we’ll be doing well. There are too many things that can’t be modeled. For example, construction of new roads – to use this inside the model, we need to have a document, or a plan, or something official that says they’re going to build a road here... we can’t predict new settlements either. But if somebody builds a road that cuts the MBR in two…

This modeler, with over 15 years of experience in the reserve, rejected the idea that the landscape was predictable based on past patterns or current plans.

Similarly, throughout my interviews – with GIS technicians, NGO workers, state park service representatives, community members, and others – when I asked about the future of the reserve, the question was met with frustration, lengthy pauses, vague statements, and frequent exclamations of “Saber!” (Who knows!):

- “… the future of the reserve in the long term is that without… if there… there aren’t… state policies… well defined state policies… although… in the long term… the way we’re going… we could be losing it, if there are no state policies. Now, if there were state policies, we could talk about, about… *gobernabilidad*, conservation, we could talk about… we could keep this biggest piece [of the forest], right?”
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- “well… what do I think of the future? Well, I don’t know. No… the way things look with… with… with the advance of the agricultural frontier, the, the, the people, the political will… lots of times that’s what, what… in the end, those who are making the decisions don’t do anything, because it doesn’t suit them, you know?”
- “ohhh [grimacing]. Well, there are a lot of areas being recuperated, but narcotrafficking is increasing a lot as well … I don’t know. But if you trust that they’re going to recuperate a lot of area, and maintain it, maintain what they’ve got… who knows.”
- “Oh man! Every day… you always fight, but… I don’t think, I don’t think… I don’t know if I’m thinking badly, if I’m a pessimist, but … every year a little is conserved, but something is lost in another area, and that’s how it goes.”
- "It depends on which people are in the government, so… you can’t predict.”

These quotes demonstrate a widely shared sentiment that reliable prediction – of any kind – is simply impossible.

Similarly, at that same meeting between NGOs and community concession representatives, the group struggled with setting future project budgets based on too many predictions. The uncertainty in the meeting was extreme, trying to decide what to do with future REDD+ earnings that were themselves based on a series of increasingly contingent possibilities: if REDD+ project participants settle on a legal structure, and if that structure is recognized by the UN program and becomes a formal project, and if future deforestation in the reserve is at least 50% less than CEMEC's
model's current predictions, and if carbon markets are selling at a price that will make those differences profitable, then how and where will we spend those earnings? The gathered men were then asked to determine the answers to the how and where on the basis of yet another prediction, the model. In the meeting, multiple attempts were made to find ways to build flexibility or "emergency" response funds into the budget plans, widely agreed among those assembled (including NGO representatives) to be the most important thing they could do with future payouts. But the rigid dictates of REDD+ program structures did not allow for this kind of flexibility, leading the men struggled with not just how to predict the future, but how to budget for the widely expected unexpected.

This reluctance to engage in prediction reflects the extremely rapid social and environmental change that has drastically altered the Petén’s landscape over the past 40 years, itself the product of deep and ongoing histories of violence, social and ethnic inequality, corruption, and political instability. The rapidity and unpredictability of these historical changes, combined with continued impunity, non-transparent power structures, and too many competing visions and interests in the landscape, lead to understandings of landscape dynamics that reject the separation of the technical and political inherent in the REDD+ project. In addition, these lived understandings express an anxious refusal of prediction that far exceeds typical scientific discourses of “uncertainty” like those built into the deforestation model, which can be measured and reported in neat statistical packages. Instead of predicting
and planning for anticipated futures, conservationists are locked into longstanding patterns of reaction, anxiously awaiting the emergence of new emergencies.

*The unpredictable present*

This dynamic of interruptive emergency permeates every aspect of conservation work in the reserve; work plans on all time scales are constantly rearranged to deal with sudden, unexpected occurrences. These may be a fire set out of place, armed assault in an isolated community, or the proposal of a new law or regulation by a politician with rumored connections to organized crime. It may also just be the rippling effects of lack of planning across actors and institutions, such that some meetings are abruptly cancelled when key individuals are found to be out of town, or simply decide they have something better to do. These are the unpredictable rhythms of daily life, met with sighs of resigned acceptance: "*ni modo*" (nothing to be done). People may not like these interruptions, but they do know how to take advantage of them; when, instead of cancelling plans, people suddenly show up in CONAP or NGO offices without them, schedules are rearranged such that previously unplanned meetings now interrupt other work, and so on.

CEMEC's many regularized work rhythms are also subject to this constant interruption and sudden urgency. The office's work plans are structured by the orbital movements of satellites, regular 8-5 office hours, CONAP bureaucratic requirements, WCS's grant funding cycles that shape the office's staffing and equipment, and the four year political cycle of Guatemala. Most of all, the computer lab's annual work rhythm closely follows the cycling of the seasons: February through June are the most
intense months of work, including daily, weekly, and monthly fire reports, the best satellite images of all year (due to lower cloud cover), and the carrying out of all monitoring flights (which must fly during these months to avoid hurricane threats). The rest of the year is then spent processing the enormous amount of images that flowed in during the dry season and preparing CEMEC's annual reports. But even these regular rhythms are interrupted daily by sudden emergencies in the field that require maps or data, last minute requests for projects or proposals from other agencies, or other unexpected and unscheduled work. Victor Hugo told me:

There are things that are clearly urgent. For example, somebody comes in saying, "look, we have reports of a fire in the heart of Tikal," clearly that has to be priority number one over anything else we're doing. But usually, too, people have their own priorities, and also expect that we act really quickly. They're probably not very used to that. Here, we act almost instantly. People expect their things to come out in one hour, 20 minutes, and sometimes we have whole things to do with a half hour notice, right? And we're doing other things, which are also priorities, so sometimes it's a little bit frustrating. But that's the way CONAP functions. Here, almost everything is unforeseen. There are emergencies all the time. You just have to get used to it. There's no alternative.

This dynamic repeatedly pushed back the completion of several major CEMEC projects, including the *State of the Maya Biosphere Reserve* report (which was still an incomplete draft in early 2012) and the REDD+ deforestation model, which even
when presented to the multi-sector roundtable meeting as a major technological achievement, was not yet fully realized.

**What does a good model do?**

The rejection of the REDD+ model's predictive accuracy by project opponents, participants, and leaders alike seems like it would lead to rejection of the model itself – but in fact, quite the opposite was true. Despite informal rejection of the model's claim to a foreseeable future, the model itself continued to be upheld as a singular achievement in Guatemala and across Central America. According to the standards of the UN REDD+ program, the statistical standards for a deforestation model's predictive power must be at or above 80% (measured as the model's ability to predict current patterns based on past inputs). In late 2011, CEMEC estimated the statistical validity of their model at between 88-93%, well above this general standard – a sign, along with the numerous data types and sources used as inputs for the model, of a technical expertise exceptional for this small, troubled country. Despite the fact that nobody believes in the model’s highly sophisticated predictions, nearly all agree that it is an excellent model (the single exception of the tourism consultant tempered his accusations of "bias" by disclaiming his own lack of technical expertise).

So even if it doesn’t predict the future, CEMEC’s REDD+ model *works*. It works in two particularly strong ways, neither of which have anything to do with the model's predictive output. First, the model has generated new forms of technoscientific knowledge about the *present* state of the reserve, resulting from a combination of
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project seed funding and international data standards linked with the UN REDD+ program. Second, the model serves as a solid technical basis around which to continue working towards the larger REDD+ project, drawing institutions, individuals, and areas of the landscape into novel connections and scales, and drawing new funding and investment into the reserve.

Creation of the model has allowed CEMEC to achieve new levels of data acquisition, analysis, and standardization, all of which have had secondary effects on CEMEC's other projects throughout the reserve. First, UN REDD+ criteria required CEMEC to standardize its definition of forest cover (minimum 5m height and 30% crown cover), which had previously been evaluated by eye in aerial photography and satellite imagery. In order to properly assess forest cover based on this definition, the REDD+ project also included funding for the purchase of high resolution satellite imagery and orthophotos (geometrically-corrected aerial photographs) to verify their data, including images from previous years. These high resolution data, usually unavailable on CEMEC's precarious budget, have led to much more detailed spatial and numerical measures of the reserve's historical deforestation rates than had previously existed, as well as the calculation of statistical error based on comparison of multiple data sources (an alternative to ground truthing). These new analyses have since been incorporated into a wide variety of other contexts, such as the State of the Maya Biosphere Reserve report and WCS's ecological monitoring presentations to community forest concessions.
Beyond these improvements in data access and analysis, the REDD+ program also requires inclusion of metadata into all deforestation measurements and projections. Metadata is "data about data," including both methodological and contextualizing information and highly technical details about data structure and design – for example, metadata for CEMEC's aerial photographs might include flight altitude, camera equipment, time and date, map projection used in georeferencing, or other factors secondary to the data contained within the photographic images. The inclusion of metadata is essential for sharing raw data (rather than complete analyses), but CEMEC has historically been very limited in its ability to document metadata because of the emphasis on rapid turnaround times for their analyses. As Victor Hugo reported:

A problem with metadata is that usually we have to work under so much pressure, and so quickly, that sometimes there really isn't very much time for putting metadata into things. But we want to change that. Really, we want to change everything – that all the information should have metadata, that all the information is described very scientifically, with the limitations it has, or if it's possible, to include a numerical measure of probabilities or error values. We want to do it, we'll see if it's possible for us to do it.

CEMEC's work on the REDD+ model was a first step towards this scientific goal:

"We're forced to do it [metadata] for the REDD+ project, so we're starting to change perspective to try to document things more rigorously." Overall, the development of the REDD+ model has resulted in access to new, high-resolution data, novel analyses
of factors that led to current deforestation patterns in the reserve, new advanced skills
and technical capacity in CEMEC's technicians, and the lab's ability to participate in
internationally-recognized standards of data management as signaled by the inclusion
of metadata.

In addition to this technical work, the REDD+ model also does a lot of
political work in the reserve. The creation of the model has created a new boundary
object around which a wide variety of people and institutions can gather, allowing
coordination without consensus (Star and Griesemer 1989). While little faith is placed
in the content of the model's predictions, its status as a standardized, rigorous
technoscientific object allows the REDD+ project to continue, despite years of social
and political conflict hindering its development. And while these conflicts may never
settle, and the project may never even technically begin (let alone result in eventual
carbon market earnings), even the process of trying to determine a legal and
economic structure for REDD+ carbon rights has created novel alliances,
perspectives, scales, and drawn new funding into the reserve. The above project
meeting with NGOs and community representatives was exactly one such new
alliance, drawing concessions together into a “united front” despite ongoing tensions.
Similarly, WCS and CEMEC joined the REDD+ project after it had been under
development for several years, creating new shared interests and projects between
these institutions and others like the Rainforest Alliance, which leads REDD+
development across the country.
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The model may fail at prediction, but this is far less important than having a solid technical base around which to build new spatial and institutional alliances, and to gain access to new forms of conservation funding that rely on monetary valuation of environmental services. But even this question of financial return from REDD+ relies on uncertainties, a market-based future in which there is also little belief. A similarly tense calculation between potential future payouts and current funding needs determines participation and investment in the project's planning stages, especially due to the existence of seed grants and funding available for even planning stages of REDD+ activities. Those developing the project are well aware of REDD’s many critiques and likely failures – one WCS consultant referred to the program as a porquería (junk, nonsense) – but that’s where conservation funding is coming from now. As one project leader said to me: “REDD+ is a total mess, but that's the game now, so we have to play.” He continued:

Otherwise the MBR is going to lose out in the short term. Now, if I were in charge of the world, I'd change the whole way things were run. I'd try to make things more fair. But we're on the bottom step, you know, we can't make these decisions. So we just have to play the game.

Conclusion: Alternative Presents and Possible Futures

The REDD+ model, following international standardizations, is not allowed to predict any deforestation that does not result from direct extrapolation of past deforestation patterns, and therefore does not include conservationists' deepest fears:
that the government of Guatemala will simply give up and un-declare the reserve (or large pieces of it) altogether. Instead of imagining this as a terrifying future, the landscape of the northern Petén without the Maya Biosphere Reserve is mapped as an nightmarish alternative present – what would have happened without the declaration of protected areas in 1990? (figure 7.3). Here the forest is lost not in some far off future, but in a bizarro-world where present day fears of ungovernability, lack of political will, non-transparency, and reckless profiteering have won out over any ecological concerns, erasing the reserve from history altogether (though the image still maps its ghostly outlines).
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This map is a product of pure imagination, an exercise in modeling the future of fear without remaining beholden to standards of rational predictability. Victor Hugo explained the process of creating the image:

We assumed the construction of two or three roads that we had heard talked about. One of those was from Carmelita to Mirador, another was the road to Uaxactún, and the other from here in Flores to the border with Belize. And we applied the same deforestation rates from the buffer zone, inside. But it was not a scientific exercise, but rather a visual one.

This image was included in the "future of the MBR" section of State of the Maya Biosphere Reserve presentations and reports. So although the map purports to show an alternative present reality, it is a mapping of local imaginations of an entropically-inevitable future, held at bay for as long as possible by conservationists and their allies. Another of CEMEC's technicians told me:

[The current situation] is critical. It's critical… lots of people, working in protected areas for 20 years. The reserve has been here for over 20 years now, and it still exists. It's still here. 75% of what was here before, 75%. So, I think that the destruction process is slow … What we do here – among all of us, the whole work team – is make the process of destruction of the Maya Biosphere Reserve slower.

That the continued existence of the reserve after only two decades should be so notable – it still exists – points to the looming presence of a reserve-less reality,
always just around the corner. It takes all the running you can do, not just to keep in the same place, but to move backwards just a little more slowly.

Governmental un-declaration of the Maya Biosphere Reserve is the only potential challenge to its legal claim over the landscape, but not the only challenge to its ontological claim defining the region as protected nature. The pasts, presents, and futures of the Northern Petén are too many to hold together, and meet in ways that are sometimes violent, sometimes profitable, sometimes hopeful, and always unequal. From the ruined structures and ecological traces of the ancient Maya to powerful claims of Petenero forest identity and belonging to social memory of scorched earth genocide, the histories of the region refuse to stay neatly relegated to the past. From territorial battles between drug cartels to overlapping protected area declarations to the contradictory material semiotics of fire, multiple claims to the reserve's ontological worlds jostle and interrupt each other in constant emergencies in the present.

The futures of the reserve are unlikely to unfold as predictably as the REDD+ model would have it. But still, the model – like the rest of CEMEC's maps, reports, statistics, and official data – allows particular kinds of action, alliance, and response to take place in the present. These official technoscientific knowledges never accomplish a singular vision or version of the landscape, though their repeated visual instantiation of reserve boundary lines is extraordinarily powerful in holding together the reserve's many parks, concessions, administrative regimes, settlements, and ecologies as a unified object. Even this appearance of singularity falls apart in the
practices of mapping, the ways that people read the maps (and their silences), and the ways that they coordinate and move between mapped and multiple lived realities.

The futures of the reserve are similarly multiple. In early 2014, CONAP-Guatemala finally approved the publication and distribution of the DOI project report on gobernabilidad, which was under construction in 2011 – a sign that the government of Guatemala may be moving towards accountability and acknowledgment of its own weaknesses. At the exact same time, Claudia Paz y Paz, the Attorney General who has done so much to bring accountability to the country's legal system, as well as Judge Yasmin Barrios, who oversaw the conviction of former dictator Efraín Ríos Montt for genocide, are being forced out of their positions under questionable legality in clear retaliation for their effectiveness in standing up to historical and current impunity. Redesigns of the Mirador region continue to be pushed at the highest political levels (FARES 2014), while community forest concessions continue to garner international praise for their conservation success (Chow et al. 2013). Accountability and impunity, parks and people, conflict and collaboration, all will carry forward along with their many clashes and contradictions. Hope and fear mix in anxious double-visions, where the more things change, the more they stay the same. Siempre en la lucha.
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