Title
Sustaining place-based knowledge through collaborative archaeological research: Case studies from Darién, Panama and Chontales, Nicaragua

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Publication Date
2023

Peer reviewed|Thesis/dissertation

Sustaining place-based knowledge through collaborative archaeological research: Case studies from Darién, Panama and Chontales, Nicaragua

By

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A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Anthropology

in the

Graduate Division

of the

University of California, Berkeley

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Summer 2023

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Abstract

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This dissertation describes the epistemic benefits of pursuing archaeological research in full partnership with Indigenous, descendant, and local communities, with particular attention to place-based knowledge and political context, drawing on my experience as a technical specialist and field worker on an archaeological project in the Chontales region of Central Nicaragua and as a co-principal investigator of an archaeological project in the Darién region of Eastern Panama. I begin by discussing examples of place-based knowledge shared with me by community partners and situate this concept within Native American and Indigenous Studies scholarship more broadly. I then describe how the political contexts of the communities with which I have worked have presented opportunities and challenges for ethically and epistemically effective collaborative research, including a consideration of trends in regional archaeological scholarship as they interact with these politics.

A central feature of politics in Lower Central America, as in other settler-colonial contexts, is a lack of engagement with Indigenous Law on the part of settler political institutions. I explore this problem through the case of place-based internationalisms, which are structures, widespread across Indigenous legal systems, that employ place-based knowledge to coordinate international political relationships by tying diverse rights and responsibilities to particular places, thereby creating overlapping political landscapes that are often misunderstood or ignored by practitioners of settler-colonial law and archaeology alike. More generally, because of the importance of heritage in practices of nation-building, and because of explicitly and implicitly shared concepts in archaeology and settler-colonial law, archaeological research conducted without careful consideration of its political context can inadvertently promote nationalist agendas and undermine Indigenous sovereignty. In both Panama and Nicaragua, archaeological scholarship has been instrumental to nationalist projects, particularly by unwittingly sanctioning narratives of Indigenous disappearance.

Beginning from the earliest phases of partnership initiation and project conception, and continuing throughout the research cycle, I dedicate the latter chapters of this dissertation to proposing alternative frameworks for collaborative archaeological practice in these places. I direct my focus primarily towards prospection—typically the first phase of archaeological investigation, with implications for all subsequent phases of research—and zooarchaeological laboratory analysis, which is often conducted without any involvement from community

members, even in otherwise collaborative projects. I present results of both phases of investigation from Panama and Nicaragua respectively, detailing the ways that both place-based knowledge and political contextualization have been crucial for realizing in practice the potential epistemic goods that scholars of archaeology have long identified as a disciplinary benefit of collaborative research.

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Acknowledgements

When I first decided to apply to graduate school, I was warned that writing a dissertation is a lonely process. As I reflect on the work that went into these pages, those words of caution ring entirely untrue. It is my great pleasure to have the opportunity to acknowledge some of the communities that have taught me, dreamed with me, challenged me, and supported me.

First and foremost, I would like to thank the Indigenous, descendant, and local communities that have welcomed me, without whom this work would not have even been imagined. The Confederated Villages of Lisjan Nation, particularly Tribal Chair Corrina Gould, have been incredibly gracious hosts during the seven years I have lived in their homeland of Huchiun. Our work together has completely changed the way that I relate to place and community. I wrote this text entirely in Huchiun, and although it focuses on archaeological work conducted elsewhere, the knowledge that Corrina and other Tribe members have shared with me about the right ways of relating to the place that we both live has permeated every page. I would like to thank the *pueblo originario* of Mogue, particularly the Dirigencia (Presidente del Congreso Local Alcibíades Calderón, Vicepresidente del Congreso Local Alberto Rito, Dirigenta Elerma Mesua, and Secretario Arnulfo Caisamo), for teaching me about Indigenous governance and the relationship between nation and land. The opportunities to participate in *congresos* with hundreds of community members, engaged in thoughtful discussion and debate about our collective work and its relationship to sovereignty, inspired much of my thinking about Indigenous politics and Law. I am especially grateful to Aristides, Tom, and Yambi Teucama for their generous hospitality (and for teaching me to make proper *patacones* and rice). I would also like to thank the community of Aguas Buenas, especially Eleucterio Castillo and Sahirín Duarte, and the communities of Sonzapote and Sontolar, for introducing me to what I now understand as place-based knowledge and the complexities of Indigeneity in settler-colonial contexts.

I am fortunate to have been welcomed into the small but vibrant community of archaeologists working in Lower Central America. This dissertation was written with all of you in mind, and I hope you will find these ideas worthy of discussion and debate. I would particularly like to thank Alejandro Arteaga Saucedo, Dita Auziņa, Suzanne Baker, Adam Benfer, Adam Berrey, Clifford Brown, Richard Cooke, Carrie Dennett, Kaz van Dijk, Arturo García de León, Katherine Guerra Cheva, Marie Kolbenstetter, María López Rojas, Jessica MacLellan, Sharisse McCafferty, Tomás Mendizábal, Susan Monge, Hector Neff, Yahaira Núñez Cortés, Silvia Salgado González, Ashley Sharpe, Russell Sheptak, Venicia Slotten, Nicole Smith-Guzmán, Irene Torreggiani, Yadixa del Valle, and Thomas Wake, for inviting and engaging with my work, for logistical support, and for many fun and fruitful conversations, in Central America and abroad. Alexander Geurds and Geoffrey McCafferty were the first to receive an email from a college senior curious about Nicaraguan archaeology; your generous response and support ever since have made my graduate career and anything that may follow possible. Natalia Donner, you have been an exemplary collaborator in every meaning of the word. Any success I have had directing archaeological fieldwork is thanks to your mentorship and confidence in me. Many ideas in this text originated from our conversations, whether over Zoom, in a *piragua* on the river, or at the bottom of a pit, and I look forward to thinking with you for many years to come.

I am grateful to Rosemary Joyce, Lisa Maher, and Mary Power for serving on my dissertation committee and for their guidance during my graduate career at UC Berkeley. Mary's

Freshwater Ecology course gave me the foundation for investigating the relationship between archaeological sites and lakes, rivers, and wetlands in Nicaragua and Panama, and her experience working in Panama helped me think through recent social and ecological transformations. In addition to her help with stratigraphic analysis and other things geoarchaeological, Lisa's seminar on the "Archaeology of Technology" was instrumental to developing the approach to zooarchaeology described in Chapter 5. Rosemary's influence on this text is evident in the many citations of her work throughout; I was fortunate to participate in two seminars she organized on Lower Central America, and her thinking about this complex region, especially its sociopolitical organization, is directly responsible for my thoughts in Chapter 2. Although I applied to work with Rosemary because of her exemplary archaeological fieldwork in Honduras, it is her politically oriented scholarship, whether about the relationship between archaeological tourism and Indigenous communities in Central America or repatriation in the United States, that has played an even greater role in my development as a scholar.

To my sister, Ella: Thank you for showing me how to imagine. To my mother, Sue: Your respectful curiosity about and openness to anyone with a story to tell, and willingness to give them the time to tell it, have made me a better anthropologist, traveler, and person. To my father, Jim: From the time I was a kid, you helped me see the political in everything and understand how complex political institutions work (and who they do and do not serve). That perspective is directly responsible for the central argument of this text. To Jordan: Thank you for helping me fall in love with the Bay. Your deep engagement with these ideas, the respect you have always accorded my work, and your faith in me have given me the confidence to present these ideas and the desire to pursue them further. I look forward to continuing to learn about place and community together, as we continue to make our home and family.

Chapter 4 is an expanded and reworked version of "Archaeological Survey as Participatory Counter-Mapping: Indigenous Sovereignty and Epistemic Change in Darién, Panama," published by Oxford University Press in 2022 in *The Oxford Handbook of Global Indigenous Archaeologies*, edited by Claire Smith, Kellie Pollard, Alok Kanungo, Sally May, Sandra Lopez Varela, and Joe Watkins. I would like to thank the editors for the invitation to contribute to this important volume and for their helpful revisions to the text.

Chapter 1
Introduction

In 2017, during my first season of archaeological prospection within the Zapatera Archipelago of Nicaragua, located about a one-hour motorboat ride from the western shore of the 8,264 square kilometer Lake Cocibolca, a community leader named Rene introduced me to a boulder. He said it had been modified to represent Mombacho, a volcano looming over the island from the mainland (Figure 1). Rene described in detail how pockmarks, striations, and concavities on the boulder portray the aftermath of specific volcanic episodes, including rockslides and avalanches resulting from two flank-collapse events in 270 and 490 CE, over 1500 years before Rene was born (Shea et al. 2008; Stansell 2013). These events dramatically changed the lake's geography; the first deposited debris in a 56.8 square kilometer area with an average depth of 22 meters, creating both the Asese Peninsula and the Las Isletas Island group, comprised of over 300 islands. Archaeological evidence suggests that the Zapatera Archipelago was first occupied between 0-300 CE, if not earlier. Therefore, its inhabitants would have been affected by one or both dramatic events (McCafferty 2014). Although the volcano hasn't erupted since 1570 CE, Zapatereños continue to remember and transmit knowledge about this powerful being in the landscape.

Figure 1. Volcanic bedrock outcrop on Zapatera Island, with modifications that represent various volcanic episodes in the history of Mombacho.

I initially sought collaborative research opportunities with communities around Lake Cocibolca in 2014, when I learned that this largest lake in Central America was at risk of bisection by a trans-isthmian canal—set to be deeper and wider than the Panama Canal. After two years as zooarchaeologist for the Proyecto Arqueológico Centro de Nicaragua under the direction of Alexander Geurds (Leiden University), in the region of Chontales on the eastern side of the lake (see Chapter 5), I began my own project near the western shore, on the Zapatera Archipelago. In initial meetings, community leaders and I discussed various strategies for the protection of this ecosystem, including ecological survey, paleoecological reconstruction, environmental archaeology, and oral history—agreeing that a pluralistic approach would be essential.

However, community leaders were unanimous as to where the project should begin: a survey documenting the numerous petroglyphs dotted throughout the archipelago, concentrated along Zapatera's ancient footpaths, which link the island's archaeological sites and still function as primary transport routes. It was through this survey that I came to understand what it means to care for the lake and its inhabitants.

Collaborative archaeology and place-based knowledge

One day, a Zapatereño named Yader and I were surveying along a footpath and bent down to consider an image inscribed on an igneous boulder at waist height. He instructed me: "Vierte el agua,"[1] handing me a gasoline canister filled with water from a nearby stream. I responded: "No, está bien gracias, puedo ver el diseño."[2] He laughed and replied, "No es para ti, es para el pescado! No pueden vivir sin agua. Quiere nadar."[3]

I decided to trust Yader and, before filling out any survey forms, we watered the fish. Its scales glinted as the sunlight fell on the wet rock, and I could make out faintly carved bubbles emanating from the stone fish's mouth as the water brought him to life (Figure 2). Through not just observing but also directly participating in this phenomenon, I began to think about the landscape in a new way and take seriously the agential capacities, both past and present, of the more-than-human beings that comprise the majority of any archaeologist's dataset. How can present-day interactions with these beings inform our understandings of the ways in which past human actors have formed relationships with them? How does acknowledging the agential capacities of, for example, carved stone when it comes into relation with human beings, open us up to the possibility of alternative ontologies, with different animacy hierarchies than our own? I realized quickly that if I wanted to understand the material culture of Zapatera Island, I needed to engage seriously with the knowledge held by community members and figure out how to communicate it in terms that are intelligible to other archaeologists—not as symbol or metaphor, but as reality.

[1] "Pour the water."
[2] "No, thanks, I can see the image."
[3] "It's not for you, it's for the fish! They can't live without water. He wants to swim."

Figure 2. Stone fish.

As our survey continued, I learned more of the knowledge stored in these petroglyphs that became animated through our interactions with them. I learned that the ecological history of this lake lies not only in its sediments, but in human-made archives like submerged petroglyphs that poke their heads in and out of the water with the seasons, tracking the changes in lake level, and signaling to community members the right time to catch certain fish. These experiences on Zapatera Island were my first sustained encounters with what I now understand as *place-based knowledge*, the relational ideas and practices that emerge and evolve through long-term human engagements with particular lands and waters (after TallBear 2013; see Chapter 3). This knowledge is created, sustained, and transmitted through continued engagement with a particular place. Since, I have come to see examples of place-based knowledge shared with me by community members living in every place I have conducted archaeological work. However, if that knowledge and the ontological system it is a part of are not considered in the project design, they can easily be overshadowed by the historical weight of traditional archaeological interpretation. Chapters 3-5 of this dissertation are devoted to explicating this idea of place-based knowledge and its varied implications for archaeological practice at multiple phases of the research cycle, which comes out of thousands of conversations with community partners in Nicaragua, Panama, and elsewhere, as well as Native American and Indigenous Studies scholarship, often itself drawing on extensive oral records.

Although they may not use the specific term, the place-based knowledge held in petroglyphs has been noted by Indigenous archaeologists and community members around the world. In her book *Community-Based Archaeology: Research with, by, and for Indigenous and Local Communities*, Sonya Atalay (2012) writes about her community-based participatory work with the Anishinaabe at the petroglyph site of ezhibiigaadek asin, "writings on stone." The goal of the project was to protect both the intellectual knowledge that is resident in this stone and the physical stone itself. However, rather than relying on traditional conservation practices prescribed by archaeologists, Atalay (2012: 245) and her collaborators adopted Anishinaabe protocols of care: "Water is placed with cedar, a sacred plant, and used to cleanse the petroglyphs during a summer solstice ceremony. This 'cedar bath' is part of an important cultural protocol that brings the teachings etched in stone into contact with water…This process is contrary to the archaeological protocols of preservation and care, which instructs that the petroglyphs should be touched as little as possible."

Camina Weasel Moccasin (2017), Manager of the Aisinai'pi (Writing-on-Stone) Rock Art Monitoring Program in Alberta, Canada, has similarly relied on Indigenous teachings to craft protocols for heritage management. Through meeting with Elders from the Blood Reserve, where she grew up, she has learned that these petroglyphs were meant to erode with time and exposure to wind and rain and, therefore, this process should not be interfered with. Rather, a proper Nitsitapiiksi protocol of care involves the creation of new rock art. For example, one community member expressed his desire to carve a record of his own war deeds in this sacred space. In other words, the actual practice of artmaking, or memorializing/monumentalizing, may be as important as the resulting artworks themselves. Without diminishing the importance of individual and local engagements with petroglyphs, there does seem to be some intriguing overlaps in the way contemporary people who live with these artworks regard them as future-oriented and care for them accordingly.

The Anishinaabe petroglyph site of ezhibiigaadek asin is a particularly salient example of this future orientation associated with place-based knowledge. One petroglyph at the site depicts a *shkabewis*, a spiritual helper or teacher, which resembles an archer with drawn bow and arrow (Atalay 2012). Oral traditions say that this depicts the Anishinaabe ancestors shooting knowledge into the future for new generations, as they knew there would be a time in which language, traditions, and practices would come under threat and thus wrote in stone to ensure endurance. This stone has memories, inscribing the collective memory of the Anishinaabe ancestors in a particular locale. Thus, this petroglyph embodies the investment of particular knowledge for future generations in a particular place—place-based knowledge. And it is this future-orientation residing in these places that necessitates such practices of care through engagement by communities in the present.[4]

In other words, the particular forms that sedimented knowledge takes—which may or may not be site types that are familiar to archaeologists (see Chapter 4)—are important, but only (or at least most significantly) if the knowledge they hold can be enacted. Site preservation as typically construed by heritage professionals is not synonymous with the Indigenous practices of care I describe here, which instead tend to emphasize renewal through continued human

[4] I do not mean to imply that petroglyphs are singular in this regard. In Chapter 6, I briefly discuss my involvement in a new collaborative project co-directed with the Confederated Villages of Lisjan, on whose lands UC Berkeley sits, that investigates ancestral shellmounds in the East Bay. These places are similarly known to hold knowledge that is important to conserve for future generations.

engagement with these places. This enactment of place-based knowledge requires the ongoing protection of the places that hold this knowledge, without viewing them as static. They are instead understood to be places that hosted human lifeways in the past but also were intentionally constructed to transmit knowledge into the future. Therefore, these archives of place-based knowledge are still in the process of being constructed, necessitating ongoing community engagement with them to further this process of knowledge production.

This understanding of place challenges standard archaeological interpretation of sites as (often unintentional) traces of human activity created at fixed spans of time in the past. In this view, sites are understood to already contain their full potential of knowledge, mostly unintelligible to non-archaeologists, and the goal of archaeological investigation is essentially to translate "the site" into readable text—the form of knowledge production recognizable to Western science. If we instead understand these sites to already hold knowledge that, to the appropriate communities, needs no translation, and understand that the continued transmission and expansion of this knowledge depends on the persistence of the place on the landscape in which it is held, this has significant implications for archaeological practice (see also Laluk 2017; Million 2004; Roberts 2022). First, archaeology is not the only way or even the primary way to interpret many archaeological sites but instead can be one of many tools employed by communities in this ongoing process of knowledge production. Second, archaeological investigation must be designed collaboratively with Indigenous communities so that it does not impact the production of other types of knowledge, thereby damaging the integrity of the place as understood by the community. This insight means that often, but not always, minimally invasive methods are most appropriate. Throughout this dissertation, I continue to develop the implications that understanding archaeological sites within landscapes of place-based knowledge has for archaeological practice.

The politics of collaborative archaeology: A view from Nicaragua

Just three months after Yader and I watered the fish, on April 18, 2018, just a few weeks after what would be my last trip to Nicaragua, I watched the news in disbelief as Nicaraguan national police murdered civilians protesting tax increases and pension cuts, mostly elderly individuals (most affected by these so-called reforms) and university students (Sherman 2018). One journalist was shot and killed while broadcasting coverage of the protests in Bluefields, a city on the Caribbean coast of Nicaragua, and El Instituto Nicaragüense de Telecomicaciones y Correo (The Nicaraguan Institute of Telecommunications and Postal Services) censored the press, cancelling the transmission of at least five news channels that were covering the protests (Maldonado 2018; Voz de América 2018). Despite the cancellation of changes to social security policy on April 22 and the commencement of a national dialogue on May 16 between the national government and protest organizers, moderated by the Inter-American Commission on Human Rights, both protests and the murder of protestors continued. On May 30, 2018, for example, Mother's Day in Nicaragua, mothers of murdered student protestors organized a march held in honor of their children, and national police and paramilitary shot and killed at least 15 people attending this vigil (Navas 2018). As of April 2019, 568 people were killed during protests, according to the Asociación Nicaragüense Pro Derechos Humanos (Nicaraguan Association for Human Rights; La Vanguardia 2019). At least 600 other people have been detained as political prisoners; others were forced into exile and lost their Nicaraguan citizenship (Reuters 2019).

Just three days before the protests broke out, I attended the Society for American Archaeology conference in Washington, D.C. and presented at a session entitled "Exploring Mobility and Multicultural Lifeways in Pre-Columbian Central America," organized by two colleagues of mine with decades of experience working in Nicaragua. The presenters were all researchers working in Nicaragua or neighboring parts of Lower Central America, and those of us working in Nicaragua actively encouraged our colleagues working in what we assumed to be less politically stable places to come work with us. When I saw the news three days later, I wondered how, despite collectively many decades of experience working in Nicaragua, none of us had seen this coming. As I continued to read, I learned that protests—organized, in large part, by farmer collectives and Indigenous communities whose land was illegally expropriated for canal construction—had broken out periodically since 2014, associated with electoral corruption and the trans-isthmian canal (Ocon 2015). Although no protestor murders were reported during this time period, dozens of protestors were injured by police, hundreds were jailed, and journalists faced aggression for covering the protests. One of these protests, drawing between 15,000 and 30,000 people, took place in Juigalpa, where I did fieldwork for two years, just 11 days before I first arrived in the community (Ward 2015).

While many international archaeologists were involved in extensive discussions with government officials about the effects of canal construction on Indigenous heritage, offering their support for conducting cultural heritage surveys, as a community we were mostly oblivious to the political repression that this issue provoked, even when it directly involved Indigenous communities. On April 16, 2018, just two days before the pension-related protests, Indigenous demonstrators protested governmental negligence in the face of forest fires in the Indio Maíz Biological Reserve, home to Rama and Kriol communities (López Chavarría 2018). The fire was started by agricultural activity in a settler enclave that was not sanctioned by the autonomous community governments of these lands, undermining their sovereignty and threatening their livelihoods.[5] There were allegations that the national government was at least tacitly supportive of the settlement and its activities, as the Indio Maíz Biological Reserve is the largest autonomous reserve through which the canal, an ongoing threat to Indigenous sovereignty facilitated by continuous settler encroachment, would pass (Romero 2018). However, these protests did not make international news, and so the connection between contemporary politics, Indigenous communities, and heritage was lost on many of us (see Chapter 3).

I had started the project without fully thinking through these political issues, but the events of April 2018 both unavoidably halted my fieldwork, giving me time to think, and made clear to me that despite the relationships I had built with community members, I was under-informed about Nicaraguan politics, which I began to realize had potentially deadly consequences. Once the United States State Department had lowered the threat level, theoretically making it possible for me to resume my archaeological work on Zapatera Island, I had to decide whether that was the right decision, given the political situation. I was relatively unconcerned about the effects of political instability on my continued access to archaeological sites and collections, as I was still only in the second year of my PhD and had plenty of time to spare. However, two other concerns gave me pause.

[5] Forest fires caused by illegal agricultural activity continue to affect Indigenous communities in this area; between January and April of this year, 458 fires have been reported in the Indio Maíz Biological Reserve (Benavides 2023). Fire and its effects on environmental and human health is just one of many ways in which settler-colonialism in the legally autonomous Caribbean regions, governed by Indigenous authorities, continues to threaten Indigenous sovereignty and well-being.

First, from background research about the communities of Zapatera, the permitting process, and discussions with community members, I knew that most of the more than one thousand residents of the archipelago did not hold official title to the land they lived on. All land officially falls under the purview of Zapatera Archipelago National Park, created in 1983 by the FSLN and administered by the Ministry of Natural Resources and the Environment (MARENA).[6] Although the park technically expropriated land from large landowners, its creation did not address the land rights of those actually living on the island, who were still denied sovereignty. Zapatera is considered a Class II protected area, meaning that while research, environmental education, tourism, and recreation are permitted, construction of any infrastructure not associated with park management is illegal, as is all hunting, gathering, and farming, even by inhabitants who have lived there for generations (Enrique 2018, personal communication; MARENA 2008; Mulligan 2007).[7] In 1992, under President Violeta Barrios de Chamorro,[8] the national government returned the land to its former owners without dismantling the park, meaning that today, the island is administered both by these landowners (the Caligari Vigil and Cordova Alvarez families) and the Nicaraguan state (Arévalo Vásquez 2010). Only two of the ten communities, La Guinea and Cañas, hold legal title over their land, which is managed communally. The other communities live in a state of legal precarity; while both the private landowners and MARENA have tended to be absentee landlords, they could dispossess the residents of San Miguel Vigil, Sontolar, Terrón Colorado, Santa María, and Sonzapote at any time, and MARENA does intercept community members by boat, seizing their hunted/fished "contraband" and sometimes confiscating their boats and imprisoning them (Arévalo Vásquez 2010).

Second, I knew that despite the lack of systematic archaeological research on the island, its material culture already loomed large in national—particularly FSLN—consciousness. The most recent series of *córdoba* notes issued in 2009 (the national currency is named for the Spanish conquistador Francisco Hernández de Córdoba) represents archaeological material culture on both the 50 and 500 córdoba bills. The 50 córdoba note portrays a set of four polychrome ceramic vases placed inside of a larger polychrome ceramic bowl. These types are associated with a particular region of Pacific Nicaragua, which includes Zapatera Island; however, on the bill they are referred to as "cerámica nacional," eliding their local, Indigenous provenience. The 500 córdoba note portrays two stone sculptures in the foreground. Unlike the ceramics, which are representations of a generic type of archaeological artifact, these are representations of individual sculptures from specific archaeological contexts. One is a human figure seated beneath the head of a bird of prey from Ometepe Island, which neighbors Zapatera Island in Lake Cocibolca. The other is a cylindrical anthropomorphic figure with patterned adornments, from the Chontales region of Central Nicaragua. While these different local origins are not described, the monuments are described as "estatuaria indígena," although their display on national currency can also be read as a form of Indigenous appropriation. It is interesting to note, however, that the Indigenous origins of a craft (stone sculpture) that is no longer produced are acknowledged, while the Indigeneity of ceramic production—still an important craft associated with Pacific Nicaragua—is obscured (see Chapter 3).

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[6] The FSLN government originally planned to use Zapatera Island as a jail for the Somoza Guard rather than a national park.

[7] Fishing of certain species is permitted (Arévalo Vásquez 2010).

[8] Chamorro ran under the Unión Nacional Opositora, a coalition of political parties formed to oppose Daniel Ortega and the FSLN, who were in power from 1985-1990.

Additionally, the Dirección Nacional de Arqueología (DNA) in Nicaragua, the organization responsible for issuing archaeological permits and carrying out much of the archaeological research in the country, chose a petroglyph from Zapatera Island itself as its logo, even though the director of this agency had never visited Zapatera prior to a brief visit with me in 2017 (Ivonne Miranda Tapia 2017, personal communication). This is particularly significant given the overtly nationalist orientation of the DNA and its umbrella agency, the Instituto Nacional de Cultura (INC). For example, in 2017, I attended the first annual Coloquio de Arqueología de Nicaragua, held on the annual Revolution Day "en conmemoración del XXXVIII Aniversario del Triunfo de la Revolución Popular Sandinista." The conference materials were covered with slogans associated with the FSLN and Daniel Ortega in particular, and in addition to talks about archaeology, the conference included presentations about Ortega and the FSLN, the singing of patriotic songs associated with Nicaraguan nationalism and the FSLN, and participation in the annual all-night Repliegue march from Managua to Masaya, led by the FSLN to commemorate an important strategic victory for the FSLN during the 1979 revolution.

While participating in these events made me somewhat uneasy at the time, it wasn't until the events of 2018 that I was truly forced to contend with this association between archaeology and nationalism. For example, on June 7, 2018, I received a communication from the DNA entitled "Crimen Contra la Cultura de Nuestro Pueblo."[9] It described how "el Patrimonio Cultural de la Nación," by which the author means Spanish colonial government buildings and FSLN monuments, had been subject to vandalism:

> Como parte de la campana de odio, se dirigen ataques contra nuestro Patrimonio a fin de destruir el trabajo que ha venido realizando el Gobierno de Reconciliación y Unidad Nacional en el Rescate y Dignificación de nuestra historia y cultura…Vándalos contra la Cultura, y la Historia, enviados y pagados por la derecha golpista (Morales Alonso 2018).[10]

In this statement, the INC unequivocally endorses the national government led by Ortega, whose slogan is "el Gobierno de Reconciliación y Unidad Nacional," blaming the burning of Spanish colonial government buildings and defacing of FSLN monuments on anti-government protestors, supposedly leading a coup. However, the INC ignores the fact that national police murdered multiple civilians in the city of Granada just hours prior to these attacks, and it remains unclear whether the arson was the result of anti-government protestors or fire-bombing by the police and associated paramilitary units (Tórrez Garcia and Vargas C. 2018). Colleagues and I were asked to support this INC statement in various ways by employees of the DNA—the same people who issue our permits for archaeological investigation. One month later, around Revolution Day, the DNA posted photos of me on Facebook attending the 2017 archaeological conference, without clarifying that these photos took place in the past and without my permission.

I already had felt that continuing my work on Zapatera Island could pose a threat to the precarious land base of communities there by perhaps drawing national attention to the island's heritage, creating an opportunity for displacement of both people and their archaeological heritage. Initially, I felt that determining whether or not to continue the work should be the decision of the communities on Zapatera rather than mine alone. As soon as I became personally

[9] "Crime Against the Culture of Our People."

[10] "As part of the campaign of hate, attacks are directed against our heritage in order to destroy the work that the Government of Reconciliation and National Unity has been doing towards the rescue and dignification of our history and culture…vandals against culture, and history, sent and paid for by the right-wing coup."

implicated in these national events, however, it became clear that any continuation of the project would indicate at least implicit support for the national government's actions, as it would require active cooperation with the DNA and INC. Unfortunately, I could not discuss this directly with community members living on Zapatera Island, who did not have Internet access or reliable cell service. While I knew that press coverage of the events in Nicaragua was also likely incomplete and perhaps biased,[11] I had to make a judgment call based on information available to me, which I did in consultation with Nicaraguan friends in the country, many of whom were also actively trying to leave.

I realized at that time that collaborative archaeology necessarily involves not only building relationships with community members, but also a sophisticated understanding of their political realities, which is often impracticable for foreign researchers. While I still wish that my understanding of the political context would have been better when I began the project, I don't think that would have been possible without myself living in Nicaragua, especially because community partners on Zapatera had no means of international communication. So, given our often-incomplete grasp of local politics as foreigners, sometimes the best course of action is to do no harm, even if that means ending or suspending a research partnership and project. I felt that any continuation of an archaeological project on Zapatera Island, especially given the DNA's choice of archaeological material from the island to exemplify its nationalist orientation towards heritage, could be used to further the FSLN's goals, probably at the expense of Zapatareños. This dissertation explores these and other issues related to the political context of Indigenous archaeology in both Nicaragua and Panama, where I began a project after the events of 2018, and an examination of how understanding this context can inform archaeological practice (see especially Chapters 3 and 6).

The cycle of collaborative archaeological research: Centering politics and place-based knowledge

This dissertation attempts to explicate various phases of the collaborative archaeological research cycle—from partnership initiation, through research design and data collection and analysis, to knowledge production—illustrating the epistemic benefits of a collaborative archaeology conducted with Indigenous, descendant, and local communities that is centered on place-based knowledge and political context. It builds on a decades-long tradition of Indigenous-led collaborative archaeology (see Chapters 3 and 4). Notably, Linda Tuhiwai Smith (1999) and others in the tradition of critical Indigenous studies have investigated the power structures of the Western European academic tradition, concluding that Indigenous communities have been exploited as research subjects without sharing in the societal value research promises. Drawing on research projects conducted with, for, and by Indigenous communities, she outlines a series of "decolonizing methodologies" that follow cultural ethics or Indigenous codes of conduct and answer questions of import to Indigenous communities. Chip Colwell-Chanthaphonh and T. J.

[11] At least some of these biases and incomplete coverage are the result of restrictions on free press imposed by the Ortega government. Both national newspapers have been prevented from publishing physical editions due to blockades on printing supplies implemented by the national government, and one, *El Nuevo Diario*, shuttered completely in 2019; *La Prensa* now exists only as an online publication (Miranda 2021). *La Prensa* staff were also threatened and arrested, prompting other staff members to flee the country (Reporters Without Borders 2022). Multiple foreign reporters have been harassed and deported from Nicaragua for covering the 2018 protests (Guardian 2018). Nicaragua currently ranks 158/180 on the World Press Freedom Index published annually by Reporters Without Borders.

Ferguson (2008: 3) address these concerns from an explicitly archaeological perspective, arguing that "the discipline's past is itself the ethical foundation and the moral motivation for shaping a field that is fundamentally geared toward establishing more inclusive, democratic, and reciprocal relationships with descendant communities." The contributions of collaborative archaeology are not only ethical but also epistemic. As Alison Wylie (2015) has observed, although collaborative archaeology arose from moral obligations to descendant (particularly Indigenous) communities, the "dynamic pluralisms" it engenders—where archaeologists engage the knowledge held by community partners to inform practice—stand to also improve research outcomes. The examples in the following chapters draw on my experience participating in, founding, and directing projects in Nicaragua and Panama and working as a technical specialist (zooarchaeologist) in these settings.

Chapter 2, "Lower Central American archaeology in theory and practice," describes the history of archaeological research in this region, which is typically defined as parts of modern El Salvador, Honduras, Nicaragua, Costa Rica, Panama, and Colombia. It first outlines the various culture area concepts that have been imposed on this region and their problems, particularly as regard the issue of Indigeneity. It then discusses the overarching trends in archaeological research according to the chronology of archaeological sites in the region, as archaeological practice has differed considerably depending on the time period of most interest to the investigators. Lastly, it describes the hierarchical social models that have typically been employed to characterize societies in this area, addressing their problems and providing examples of heterarchical alternatives. I include this chapter primarily to provide an overview of the research context in which I situated my research design when I first proposed a project on Zapatera Island. As described earlier in this introduction, however, I learned quickly that collaborative work necessitates co-designing a project based first on community traditions of place-based knowledge and then articulating that within archaeological scholarship, rather than the other way around. Therefore, this is not a representation of what I think the future of Lower Central American archaeology should be, but rather a review of the state of the field when I was first conceptualizing the Zapatera project, prior to receiving community input (see Chapter 6 for a critique of this common problem in collaborative archaeology).

Chapter 3, "Archaeology in service of the present: Place-based knowledge and Indigenous sovereignty," focuses on the first phase of the research cycle: establishing partnerships and understanding political context. It describes the colonial history of American archaeology and its desecration of Indigenous sites, as well as its implication in the primitivization, essentialization, and material dispossession of Indigenous communities. It then describes the framework of Indigenous archaeology—archaeology with, by, and for, Indigenous people—that has challenged this dominant Eurocentric narrative. It explores the implications of implementing an Indigenous archaeology framework in Central America through two case studies: the ongoing project I co-direct in the Darién Province in Panama, and Proyecto Arqueológico Centro de Nicaragua, for which I was a field supervisor and the project's zooarchaeologist. I discuss the legal context of Indigenous sovereignty in both Nicaragua and Panama and the relationship between Indigenous governance, place-based knowledge, and ecological conservation. I then describe the necessity of Indigenous archaeology—and any ethical archaeology conducted with Indigenous communities and heritage—to engage seriously with Indigenous politics and consider the implications of this engagement for archaeological practice in these contexts.

Chapter 4, "Archaeological survey as participatory counter-mapping: Indigenous sovereignty and epistemic change in Darién, Panama," focuses on what is typically the next phase of research: archaeological survey. It discusses the epistemic value of a community-based, participatory mapping approach to archaeological survey, based on research co-created with the Indigenous Emberá community of Mogue in Darién Province, Panama. Rather than initiating survey with preconceived criteria for identifying archaeological sites, we mapped landscapes of place-based knowledge, as envisioned by community members. This collaborative approach represents an innovation in purposive (as opposed to statistical sampling) archaeological survey, an essential phase of research—especially in low-visibility environments—that has been neglected by literature on archaeological method. This method centers local conceptions of place and (often fluid) boundaries, as well as history and story. This chapter highlights the role that participatory mapping can play in the development of critical Indigenous cartographies, as well as its value in supporting Indigenous-led movements for sovereignty and long-term ecological stewardship, including gathering evidence for use in land claim cases.

Chapter 5, "Practice-based zooarchaeology and place-based knowledge: Persistence of Indigenous landscape management and cuisine in the Mayales River Valley, Chontales, Nicaragua," focuses on laboratory analysis, particularly zooarchaeology, within the cycle of collaborative research. It describes the contributions that place-based knowledge can make to laboratory-based analyses and outlines a practice-based approach to zooarchaeological analysis that is well suited to engagement with this knowledge and also well suited to maximize information potential from a relatively small (n=848) and poorly preserved sample. It presents the results of the first faunal analysis conducted in the Chontales region of Nicaragua, addressing human-animal relationships between 900 CE and the present day. Results suggest land management strategies that facilitated the hunting of particular species, necessitating knowledge of animal behavior and ecology, as well as the persistence of certain (primarily non-subsistence) hunting practices into the present day. Additionally, after the Spanish invasion, Indigenous communities in Chontales adopted new butchery techniques and culinary practices alongside metal tools and European domesticates, while continuing to consume native species, produce stone tools, and construct Indigenous mounded architecture. These resistances to colonization continue into the present day, as some community members continue to hunt and manufacture ceramics using traditional methods, despite political and economic pressure to abandon these practices.

I hope that these studies are suggestive of the epistemic value of collaborative, place-based knowledge production, of which academic publication is a part. The communities I work with care about archaeological scholarship, not only for its role in telling (too often without their involvement) their histories, but also for its broader implications with respect to how people across the globe relate to places. Corrina Gould, Tribal Chair of the Confederated Villages of Lisjan, who I began collaborating with locally while studying on her nation's[12] lands at UC Berkeley (see Chapter 6), says that archaeological reinterpretation—a primary goal of the Lisjan—begins with bringing community stewards of place-based knowledge back into the conversation and learning to ask different questions. This work aims to redress not only the

[12] Although most of my use of the term "nation" in this text refers to nation-states and nationalism, I also use "nation" throughout to describe sovereign Indigenous communities that use this term to refer to their traditional system of governance. See Champagne (2007) for a discussion of the meaning of this term within American Indian communities and, as a result, within the discipline of American Indian Studies.

ethical, but also the epistemic violations arising from archaeological work that has excluded Indigenous peoples. In accordance with the CARE Principles for Indigenous Data Governance (Global Indigenous Data Alliance 2023), I was given explicit permission to share all stories included in this manuscript with the academic community and public, as a part of addressing these epistemic violations, and I have done my best to present these stories in their own words and credit their tellers. Many other stories that I have earned the privilege of hearing, and associated data, are not shared because this knowledge is meant to be restricted to certain community members or people with particular relationships to those community members.

Through collaborations like these, with the descendant communities that are heirs to the place-based knowledge that archaeological landscapes hold, we can develop an archaeology that studies human engagements with place, while working for the ongoing protection of these important places and the relationships and knowledge they facilitate. Instead of implicating itself in site destruction (see Taylor 1948), archaeology can take part in the creative process of placing knowledge into the landscape, continuing the long human tradition of recording history in place and learning what these places have to tell us.

Chapter 2
Lower Central American archaeology in theory and practice

Lower Central America, defined here as the geographic area encompassed by modern-day Panama, Costa Rica, and Nicaragua, as well as parts of Honduras, El Salvador, and Colombia, remains understudied archaeologically. Yet, humans have occupied the region continuously since at least 8000 BCE. Its scholarly history within the discipline has been clouded by the imposition of borders and boundaries, both those of contemporary nations and largely arbitrary culture areas that have been imposed upon the past. Conceptualized variously as the "Intermediate Area" (first by Willey 1962; see also Drennan 1996; Helms 1981; Lange 1992; Myers 1978) or the "Isthmo-Colombian" zone (Hoopes and Fonseca 2003), Lower Central America has long been defined by what it lacks in relation to the traditionally-defined "core areas" of Mesoamerica to the north and the Andes to the south, of which it is considered merely a frontier or buffer zone (Carmack and Salgado González 2006; Dixon 1992; Fox et al. 1981; Lange 1976, 1979, 1986).

This conception of an "Intermediate Area" characterized by absence has been critiqued by prominent scholars working in the region, described as the "pervasive pejorative" by Sheets (1992; see also Joyce 2021 for a more recent review of the origins of this issue and proposed solutions). However, because localized developments have not been a focus for most of the region's history of investigation, they remain under-researched. This has resulted in skewed perceptions of relationships between societies across the Central American isthmus, which have privileged influxes from these "cores" at the expense of contributions from Lower Central America. It is true that the Lower Central American landscape is characterized by movement, as it has served as a nexus of interchange between local communities and peoples from Mexico, northern South America and even the Caribbean (Hosler 1988; Ibarra Rojas 2003). However, this does not necessarily imply a core-periphery binary. This chapter reviews the history of archaeological scholarship within Lower Central America and then addresses some ways in which heterarchical models can offer more nuanced, socially driven models for considering this area and its indigenous developments in their own right.

Instead of reviewing the history of scholarship in this area according to the chronology of the authors, it will be reviewed according to the chronology of archaeological sites themselves. This does not pretend to provide an exhaustive bibliography of all relevant scholarship; rather, it presents the most important debates that have and continue to pervade discussions of each period. I aim to illustrate the ways in which researchers focusing on particular periods were biased by the Mesoamerican characterization of the period in question, as well as a general lack of cross-temporal engagement. For certain periods, I will integrate data when relevant, from northern Central America and North and South America, in order to provide more comparative breadth for these little-known material culture records.

Paleoindian Period (?-8000 BCE)

Unfortunately, this period within Lower Central America remains poorly understood. The most substantial dataset for this time period comes from Panama, the result of an environmental archaeological research program undertaken by the Smithsonian Tropical Research Institute (STRI). These studies have dated the earliest evidence of anthropogenic changes in plant communities, as well as artifacts, to approximately 9,500 BCE (Cooke et al. 2013). However,

Pleistocene sites much further south, such as Monte Verde in modern day Chile, have yielded dates of occupation by at least 12,500 BCE (Campbell and Quiroz 2015). Therefore, earlier occupation of the Central American isthmus than is currently documented is likely.

Artifactual evidence from this period is restricted to lithic tools, the source of the primary debate in Paleoindian research throughout the Americas: were the people(s) who produced Clovis points the first to populate the Americas? The distribution of such Clovis points across much of North and Central America may instead be more accurately referred to as a constellation of practice: a network of multiple local communities of practice that, in this case, are united by a shared technological strategy for achieving a particular goal (Lave and Wenger 1991; Roddick and Stahl 2016). Within a constellation of practice, there is generally variation between communities in terms of production, style and use of a given technology. In this case, localized microtraditions have been documented within the corpus of Clovis points across North and Central America (Buchanan et al. 2014; Eren et al. 2015; Smallwood 2010).

Central America is a particularly important locale within this debate, as it is the only geographic area with both Clovis and so-called "Fishtail" points, which are generally associated with South American contexts (Perrot-Minot 2014). In a cultural diffusion model, still widely employed in Lower Central American archaeology, this is assumed to result from physical human migrations. Thus, Central America has been discussed as an intersection point between Clovis and Fishtail "cultures" (Dillehay 2000; Scheinsohn 2003). Its millennia-long importance as a landbridge cannot be overstated, as it is certainly possible and even probable that multiple groups of people encountered each other here. However, we cannot assume that these social groups corresponded directly to lithic typologies.

Indeed, there has been much debate, especially within discussions of the Fishtail tradition, over the possibility that Fishtail points represent an evolutionary "descendant" of Clovis points (Cooke and Ranere 1992; Faught 2006; Pearson 2004, 2017; Ranere and Cooke 1991; Snarskis 1979; Valdez and Aylesworth 2005) or that they both represent descendants of one "ancestral" technology (Dillehay 2000; Lynch 1991). These phylogenetic approaches to artifact analysis and other aspects of human culture, however, have also been critiqued extensively (see Cochrane and Lipo 2010; Moore 1994; Tëmkin and Eldredge 2007). Additionally, Fishtail and Clovis points coexist in four contexts: Ladyville 1 (BAAR 191) in Belize, Turrialba in Costa Rica, Los Grifos in Mexico, and Los Vampiros in Panama. In the Lake Alajuela area of Panama, points that have been ascribed to these different traditions have also been found in close proximity (Bird and Cooke 1977). Although much has been made of the fact that Fishtail points tend to be found more along the Atlantic coast (Faught 2006; Pearson 2004; Pearson and Bostrom 1998), the coexistence of these traditions at multiple sites, when there is a very low sample size to begin with, makes a clear chronology and relationship difficult to establish.

Although many of the limited corpus of Paleoindian points were found without much contextual information, investigations have identified several sites dating to this period that researchers characterize as campsites of nomadic hunter-gatherers: El Gigante in Honduras; Los Tapiales, Chivacabe, Chajbal, and Chujuyub, in Guatemala; Turrialba, in Costa Rica; and Los Vampiros, La Mula West, and Nieto, in modern-day Panama. Although projectile points were not found in direct association, two of these sites (Nieto and Turrialba) are located near stone quarries that contain lithic debitage, and Pearson (2004) constructed lithic reduction sequences for both of these sites on the basis of the lithic debitage from the associated quarries, even without the presence of complete lithic artifacts.

Multiple projectile points have been recovered in situ from El Gigante, all dating to the Paleoindian phase of site use (Kennett et al. 2023). The only point from the first phase of investigation at the site, directed by George Hasemann in 1993, was identified as an apparent "derivative of the 'fishtail' Paleo tradition identified in Ecuador and Costa Rica," although the absence of true fluting is noted (Dixon 1994: 3). Further excavations conducted by the Instituto Hondureño de Antropología e Historia and Pennsylvania State University yielded three complete and four partial projectile points, four made of obsidian from the nearby La Esperanza source and three made from chert (Scheffler 2008). Although Scheffler (2008: 7) refers to them as having a "slightly fish-tail shape," he distinguishes them from the Panamanian Fishtail points on the basis of expanding rather than waisted stems and concludes that "they are not fluted" (Scheffler 2008: 131). However, subsequent work reports the recovery of "well-fashioned wide-stemmed projectile points, both with and without basal notches or basal fluting," although Scheffler et al. (2012: 603) compare them stylistically with the much more recent (4000-3000 BP) Pedernales points of Mexico and state explicitly that "these projectile points have been incorrectly linked to points in the 'fishtail' tradition in Lower Central America."

The most comprehensive analysis of points from El Gigante to date, conducted on 37 lithic artifacts, suggests that although the fluting is not uniform, consisting of a large central flake on one face and multiple flakes on the opposite face, this pattern "supports the intentionality of the practice and the use of the term [fluting]" (Iceland and Hirth 2021). The authors also suggest that, unlike North American Clovis points, usually made on large bifacial blanks, these points were made on flake blanks, similar to other South American Fishtail points. However, they also identify attributes, including divergent ears, a notched/concave base, and small barbs, that they characterize as morphologically more similar to point types tentatively assigned to the Archaic (Xaagá points in Oaxaca and Ya'axche' points in Belize), although both of these types are described as unfluted (Reyes González and Winter 2010; Stemp et al. 2016). Thus, Iceland and Hirth (2021) conclude that for the time being, the points of El Gigante should be considered a unique style, transitional between earlier Paleoindian antecedents and Early Archaic successors, which are still poorly defined (see next section).

It has long been assumed that inhabitants of Lower Central America (and, indeed, the Americas more generally) during this time period lived in small, highly mobile groups and hunted, fished, and gathered for subsistence. Particularly, it is assumed that large game hunting constituted the primary source of protein during this period. However, recent studies have not borne this out, instead indicating a more diverse lithic tool kit (i.e., not solely large spear points) that include expedient points used to exploit a variety of plants and smaller animals (Prufer et al. 2017). Additionally, too little attention has been paid to the potential of human modifications of the environment (see Gnecco 2003 for an important exception), as well as to the human-environment interactions that would have resulted from the very different biotic and climatic conditions during this period (see Ranere and Cooke 1991 for a review of Central American paleoecology). For example, recent paleoethnobotanical investigation of El Gigante rockshelter has yielded abundant remains from the first use of the site (Kennett et al. 2023). The presence of significant quantities of edible fruit tree material (e.g., avocado and hog plum), along with bottle gourds, squashes, and agave, all of which persist through the Holocene, suggests to the study's authors that the site's residents may have already been experimenting with cultivation during this late Paleoindian period. This study illustrates the potential of high-resolution chronological analysis, in combination with detailed materials analysis, to significantly modify and fill out our understanding of early human presence in Central America.

Pre-Ceramic Hunting and Gathering (8000-4000 BCE)

Archaeological investigation of this period has faced many of the same difficulties in interpretation as the Paleoindian period: a general paucity of known sites in comparison to later periods and interpretations based on an overrepresentation of individual stone tool findspots, often without robust contexts. MacNeish separated this period into four distinct phases based on his excavations of stratified sites in Belize, which, because of the lack of known sites, has formed the foundation for substantive interpretations elsewhere in Central America: the Lowe Ha Phase (9000-7500 BCE, which overlaps with the Paleoindian Period), the Sand Hill Phase (7500 BCE-6000 BCE), the Orange Walk Phase (6000-5000 BCE) and the Belize Phase (5000-4000 BCE; MacNeish 1981, 1982; MacNeish and Nelken-Turner 1983; MacNeish et al. 1980). The Sand Hill complex was characterized by the exploitation of a greater diversity of environments, including coastal occupations. Based on this change in site location and the presence of "gouges" and "adze-like end scrapers" suggested by MacNeish and Nelken Turner (1983: 78) to have been used in boat building, Zeitlin (1984) hypothesized that marine resources began to compensate for a reduction in large game hunting associated with the extinction of Pleistocene large mammals. The Orange Walk complex was distinguished from the preceding and subsequent phases by its lithic technology: specifically, the presence of groundstone is interpreted as evidence for increasing exploitation of seed and plant foods. The Belize Phase, defined by the first appearance of groundstone bowls, purportedly corresponded with intensification of "coastal lowland 'broad spectrum' readaptation" (Zeitlin 1984: 361) and an assumption of greater population densities and sedentism.

However, the specific changes that MacNeish and colleagues associate with each of these periods are based on a generalized model of the Paleoindian-Archaic transition rather than contextual or chronological evidence. First, their chronology lacked a foundation of absolute dates, which have subsequently contradicted many of these periodizations (Lohse et al. 2006). Even the site distribution patterns that were known at the time of MacNeish's research from other areas within Central America counter some of his assertions. Within the Chajbal subarea of Highland Guatemala, for example, all identified Paleoindian base camps straddle at least four ecological zones: lake/swamp; low, moderate slope hills; flat basin floor cut by permanent streams with narrow floodplains; and steep mountain slopes and ridges at high elevation (Brown 1980). Thus, these groups clearly prioritized access to diverse environments and were likely not solely reliant on big game hunting for subsistence, which contradicts MacNeish's model of the Paleoindian-Archaic transition.

Investigations at the site of El Gigante rockshelter in southern Honduras, first occupied during the Paleoindian period (see previous section), have yielded high-resolution archaeological data that speak to this transition into the Archaic, although a Bayesian stratigraphic analysis incorporating hundreds of radiocarbon dates suggests that there was a gap of ~1000 years between its Late Paleoindian and Early Archaic use (Kennett et al. 2023). Use of the site during the Archaic was intensive but highly episodic. Overall, paleobotanical analysis suggests that human relationships with plants (avocados, hog plums, bottle gourds, squashes, agave), first developed during the Paleoindian period, persisted. Acorns began to be used towards the end of this period, shortly before 4000 BCE; the area is still dominated by pine-oak (*Pinus-Quercus*), so the incipience of this human-plant relationship could indicate a shift to more contemporary conditions in the local environment or the knowledge and labor required to remove bitter tannins from these seeds prior to consumption (Kennett et al. 2023; Scheffler et al. 2012).

This time period is still the least understood within Central America, as researchers have yet to define specific chronological markers associated with it. Much like the problematic characterization of Lower Central America as "Intermediate" in relation to Mesoamerica and the Andes, the Archaic is characterized by what came before (presumed big game hunting) and what came after (agriculture). As will be discussed in the following section, the variable trajectories towards increased reliance on true domesticates in this region involved a confluence of changing environmental conditions and, in some cases, but not all, increased sedentism related to changes in human-environment relationships and social strategies (Morehart and Morell-Hart 2015; Sayre and Bruno 2017).

Paleoenvironmental evidence from tropical Central and South America has demonstrated that between 9000 and 7500 BCE, the climate became more humid and experienced a significant increase in precipitation and runoff due to global deglaciation and associated rising sea levels (Absy et al. 1991; Bush et al. 1990; Leyden 1984, 1985; Leyden et al. 1993; Markgraf 1989). These changes would have been drastic and are hypothesized to have resulted in significant resource unpredictability (Piperno et al. 1991). Paleoethnobotanical studies of Archaic Period deposits have the potential to illuminate subtle changes in these relationships, potentially resulting from this resource instability (Flannery 1986; McCorriston and Hole 1991) that may have led to the larger-scale agriculture we see in the subsequent period.

Ceramics and Cultivation (4000-1000 BCE)

The two most conspicuous signifiers of this time period within Lower Central America are (1) the first indisputable evidence, both paleoenvironmental and from archaeological sites, for agriculture on a large scale and (2) the first ceramic production. Spinden (1917) hypothesized that sedentism, agriculture (specifically maize agriculture), and ceramics developed together in one location (the Valley of Mexico, in his view) and then diffused outward as a single complex. Lathrap (1973, 1977, 1987), in contrast, emphasized the importance of indigenous development of root agriculture in lowland South America. However, he similarly relied on models of cultural diffusion, and he and his contemporaries emphasized the similarity of ceramic technologies (and subsistence strategies) from the Andes through Central America and Mesoamerica, arguing that these similarities represented direct evidence for human movement (Davis 1975; Lathrap 1977; Lowe 1975; Myers 1978).

With the advent of more research into this time period and a shift within archaeological theory away from cultural diffusion models, it is now clear that agriculture did not originate from a single center of origin. Instead, it arose gradually as different groups of people occupying diverse environments began to cultivate local plants, eventually resulting in the development of genetically distinct varietals. This section will address these indigenous and exogenous agricultural traditions before discussing the development of ceramic technologies and their connection to the new human-environment relations entailed by such cultivation techniques.

The most extensive studies related to the advent of agriculture in Lower Central America have been carried out in Panama as a component of the long-term research projects of STRI. Isotopic analysis of human remains; pollen and phytolith evidence from archaeological bulk sediment; and pollen, phytoliths, and macrofossils from nearby lake cores all suggest that significant consumption of maize and, specifically, use of slash-and-burn agriculture occurred by at least 5000 BCE (Norr 1996; Piperno 1990; Piperno et al. 1991). The earliest direct evidence for both maize and root crop cultivation in Lower Central America dates to between 5000 and 3000 BCE, from the Aguadulce rock shelter on the Pacific Coastal Plain of Central Panama

(Piperno et al. 2000). These manioc, yam, and arrowroot starch grains, retrieved directly from groundstone artifacts, were found in association with maize starch, suggesting that at least some pre-Hispanic inhabitants of Central America exploited both seed and root agriculture simultaneously. Therefore, although they likely originated in different places, both became part of a suite of practices that were carried out by the same communities.

The earliest known ceramics within the Western hemisphere date to 6110-5740 to 5430-5050 BCE and come from Taperinha, a site located on the lower Amazon River (Hedges et al. 1992; Roosevelt et al. 1991). Although this precedes the time frame established for this period by Lange and Stone (1984), interestingly it accords with the earliest dates for well-established agricultural traditions. However, Hoopes (1994) postulated that maize cultivation was not a significant component of subsistence practices at Taperinha by that time, arguing against the impulse to couple the advent of ceramic technology with agriculture. Early tuber and root cultivation, and certainly other forms of landscape management, were well underway in northern South America by this time (Castillo Espitia and Aceituno Bocanegra 2006; Mora 2003; Piperno and Pearsall 1998; Rossen et al. 1996).

Additionally, it has been argued that the decoration (although minimal) present on ceramics within the earliest strata at Taperinha demonstrates that undecorated wares would have preceded them and that these "more rudimentary" ceramics are just waiting to be discovered (Cleary 2001). However, we must remember that the earliest fired clay objects in the world, dating to 24,000 BCE from the site of Dolní Věstonice in the Czech Republic, employed the production of figurines to be exploded, likely as part of a ritual practice (Vandiver et al. 1989, 2002). The earliest known pottery containers are a hunter-gatherer technology and are found at two cave sites between 18,000 and 20,000 BP in China (Cohen et al. 2017; Wu et al. 2012). It is not until ~15,000 BP that we see the regular production of ceramic containers, of independent origin, in Japan, again among hunter-gatherer communities (Craig et al. 2013; Nakamura et al. 2001). Thus, although it was once assumed that the development of agriculture and ceramic technology were linked, this is clearly not the case elsewhere in the world (see Craig et al. 2013; Gibbs 2015; Jordan et al. 2016; Lucquin et al. 2016). This is important to keep in mind as we consider the role that these ceramic technologies played in Central America proper.

The earliest reliable archaeological evidence of pottery production on the isthmus is reported from a narrow alluvial plain bounded by mountains, on the edge of Parita Bay, in Panama (3780-3360 BCE; Bird and Cooke 1978; Cooke 1995; Iizuka et al. 2014; Willey and McGimsey 1954). These finds predate the first known ceramic production in Mesoamerica, and therefore it is likely that ceramic production in Lower Central America either developed from practices that initially coalesced within northern South America, in the Amazon basin, or arose independently. Hoopes (1994) provides what is still the best overview of absolute dates associated with this itinerary, thoroughly critiquing the contexts and materials that are dated and comparing and contrasting descriptions of the earliest type varieties on the continent.

Formative Period (1000 BCE-500 CE), Expansion Period (500-1000 CE) and Late Period (1000-1550 CE)

The majority of archaeological work within Lower Central America has dealt with these three periods, as they represent (traditionally) the inception and rise of chiefdoms and their accompanying criteria, including links with Mesoamerica, following the evolutionary framework proposed by Elman Service (1962; see, e.g., Carmack and Gonzalez 2006; Drennan 1993; Helms 1992a, 1992b; Lange 1992). However, these three time periods as proposed by Lange and Stone

(1984) are not associated with significant shifts in material culture for many contexts within Lower Central America. Recent work within the Chontales region of Nicaragua, for example, has proposed instead that one of the most significant transitions in lifeways as represented by material culture occurred in 1250 CE, bisecting the so-called "Late Period" (Donner 2020; Donner and Geurds 2018). We are fortunate enough to have the requisite data to approach trajectories within these periods in a more localized manner, considering more specific environmental data (see Dennett 2016 and Sheets and McKee 1994 for some good examples of this elsewhere in Lower Central America).

Inherent in this model is the idea that chiefdoms are sociopolitical systems which have not advanced to statehood rather than intentional systems in their own right. Despite a long history of interaction with "state" societies in Mesoamerica and South America, there is no evidence to support the inference that Lower Central American societies were peripheral in any sense. They were not subsumed or colonized by these external state societies but rather engaged in sustained economic, social and political relationships with them (see Scott 2009). They also developed and maintained extensive economic, social, and political networks with other non-state societies in Mesoamerica, South America, and the Caribbean (see Graeber and Wengrow 2021).[13]

Additionally, this type of classificatory rather than practice-based approach tends to prioritize study of sociopolitical elite relations and machinations as opposed to daily life and quotidian experience. It also pays significantly more attention to identifying evidence for the existence of a ruling class and its capacity to maintain entrenched sociopolitical power rather than examining the initial development of such systems, in a more process-oriented Braudelian (1979) or structuralist fashion (Giddens 1986). Hoopes (2005) is noteworthy for delving into the various historical definitions of chiefdom, which many of the works mentioned above take for granted, as well as providing a substantial bibliography of references associated with the "emergence of complexity." He asserts, "I recommend caution in equating the emergence of social complexity with the formation of chiefdoms. It is difficult to establish...on the basis of archaeological evidence from the Chibchan world" (Hoopes 2005: 6). Interestingly, in his earlier work, he explicitly rejects the use of the term "chiefdom" for Costa Rican contexts, proposing instead the classification of "complex tribe" (Hoopes 1991). However, this is similarly problematic in implying a particular position on a timeline of linear progress (see Arnold et al. 2016). Prominent scholars have questioned such linear characterizations of Central America, critiquing the presumption of statehood as an end goal and proposing alternative, heterarchical models of political organization (Hendon 2002; Joyce and Hendon 2000), but these perspectives remain in the minority.

Archaeologists have been concerned for decades with how non-state societies have maintained integrity, largely beginning in the 1950s when approaches to social change and continuity became more systematic. This arose from a longstanding tradition in ethnology as a result of colonial encounters in Africa, the Americas, and Australia. European scholars were perplexed by the so-called "tribes without rulers" (Middleton and Tait 1958) that they encountered—how were decisions made, rules enforced, and integrity maintained diachronically without the bureaucratic trappings of a state apparatus and powerful ruling class? Historically, anthropologists explained this phenomenon in terms of coercive religious rather than political

[13] See my discussion of place-based internationalisms (Chapters 3 and 4), drawing on Betasamosake Simpson (2016, 2017), for an alternative model for this type of interaction.

orders that not only provided etiologies and explanations, but also a set of moral codes and their ideological basis. In this way, religion provided the unifying force in the absence of (according to these primitivizing scholars) politics proper (White 1959; Rappaport 1971; Sahlins 1968; see Fowles 2013 for a critique). Johnson's (1982) work regarding Puebloan societies in the Southwestern United States illustrates the danger of such an approach; he describes the ritual hierarchies that he says characterize these societies as "passive" strategies for dealing with group dynamics, in contrast to more "active" political mechanisms. Thus, religious practitioners are afforded less agency than their political counterparts, and societies characterized as apolitical are considered static, relying on inherited tradition rather than active decision-making. This is inherent in Service's (1993: 125) definition of chiefdom; as he writes:

> Egalitarian societies are religious in the sense of thinking in supernatural terms, behaving ritually, and holding ceremonies, but chiefdoms alter this by creating a priesthood that controls the *society* and creates a religious ideology that helps justify not only the society but the position of the rulers in it (see also Johnson and Earle 2000; Redman 1978; Sahlins 1968).

Scholars working within Lower Central America have largely followed in this assertion of ritualistic politics. So-called religious or ritual practices are commonly cited as the primary sources of sociopolitical power within pre-Hispanic Central America and are thus considered to be the catalyst for the emergence of these "chiefdoms," materially manifested in the unequal distribution of gold and other items with "inherent value" (Hoopes 2005; Quilter and Hoopes 2003).

When there is evidence for long-distance trade of objects (particularly from Mesoamerica), archaeologists have tended to assume the existence of elite ritual practices of exchange, often without sufficient evidence for restricted access of these items or evidence of a ritual nature (Creamer and Haas 1985; Day 1994; Garber et al. 1993; Helms 1992a, 1992b). Luke (2010) provides an exception to this rule, convincingly arguing for an elite network of exchange involved in the transport of Ulúa marble vases. She acknowledges that these same vases have variable significations within different networks of exchange. Often, however, these practices are assumed to have a single purpose that serves a particular political agenda: namely, to reinforce the hierarchical organization that is presupposed by the imposition of the label of "chiefdom." Hoopes and Fonseca (2003: 64), for example, describe Lower Central America as a "diffuse unity," bound together by six themes expressed through various materializations of ritual which, they argue, were employed in the service of political agendas.

Since Lower Central American polities have been a priori characterized as chiefdoms, there has been and continues to be a focus on identifying "chiefs" through the excavation of human interments, as well as the accompanying markers of inequality and structural violence that they assume are inherent in such a system (Lothrop 1937-1942; Mason 1942). However, recent work is beginning to demonstrate that such interpretations are the result of archaeological bias, calling into question the viability of the chiefdom model. First, interpretations of arguably the most famous and most sumptuous mortuary site in the region, Sitio Conte in modern-day Panama, have suffered from a lack of contextual information; many of the most luxurious items are not clearly associated with a particular individual and are instead from "cache" contexts, with unclear stratigraphic associations to the necropolis (Briggs 1993). Thus, their use to infer the preeminence of particular individuals is problematic.

Additionally, bioarchaeological remains previously said to be indicative of structural violence and warfare, for example at the site of Playa Venado in Panama (Lothrop 1954), have recently been re-interpreted as evidence of normal mortality associated with a relatively peaceful way of life (Smith-Guzmán and Cooke 2018). Despite their lack of foundation, however, Lothrop's interpretations have been cited frequently as a prime example of the violence, cannibalism and trophy head taking assumed to plague non-European societies (see, e.g, Bishop and Knusel 2005; Chacon and Dye 2007; Drennan 1993; Hurlbut 2000; Ibarra Rojas 2012; Melbye and Fairgrieve 1994). This provides just one cautionary tale of how circular reasoning within the archaeological discourse of Lower Central America has perpetuated fundamental inaccuracies, many of which involve racist, exoticizing and primitivizing rhetoric.

Colonial and Republican Period (1550 CE-present; sensu Joyce and Sheptak 2014)

Typically, historical archaeology within Lower Central America is practiced as a distinct subdiscipline from that of pre-Hispanic archaeology. In Nicaragua, for example, historical archaeology is administered by an entirely different government department. Because of a general pride in Spanish ancestry possessed by the ruling classes of Central America (e.g., in both Nicaragua and Panama, the national currencies are named after conquistadores), as well as their popularity as tourist destinations (see Strassnig 2010), the archaeology of Spanish colonial sites tends to be well funded. For example, despite their wealth of pre-Hispanic sites, the only archaeological World Heritage Sites in Nicaragua and Panama, Leon Viejo and Panama Viejo and Portobelo-San Lorenzo Fortifications, respectively, are Spanish Colonial sites (Osorio Ugarte 2012; Parrinello and Picchio 2015; Martín and Rovira 2012; Werner 2000). The typical locations of these historic sites within contemporary cities make them prime candidates for cultural resources management (development) archaeology. However, although they have often been intensively excavated and restored, these investigations can remain unpublished. This is a problem within Lower Central American archaeology in general but is especially true for historic archaeology given that most academic archaeology, both foreign and national, has prioritized pre-Hispanic heritage.

These results are typically not discussed in tandem with those from pre-Hispanic sites, as the Spanish invasion produced a rupture within archaeological scholarship (but see Blaisdell-Sloan 2006; Sheptak 2007, 2013, 2019; Sheptak and Joyce 2019; Sheptak et al. 2011). Without denying the consequences that this brought about for Indigenous communities, as evidenced by the genocide so massive that it altered the climate (Koch et al. 2019), it must be acknowledged that many individuals, especially at first, likely had no direct contact with Spaniards. And while certain lifeways did change, especially in areas with strongly enforced *encomienda* systems of brutal enslavement (see Reséndez 2016; Sherman 1979), other areas likely maintained their autonomy for longer periods of time, and Indigenous political structures persist today. Thus, no one "point" of invasion can be plotted on a timeline, and material culture traces of Indigenous resistance (Liebmann 2008; Liebmann and Preucel 2007; Wilcox 2009) and survivance (Sheptak 2019; Vizenor 1994) populate the colonial archaeological record throughout the Americas, including in Nicaragua and Panama (see Chapters 4 and 5). As I discuss in the rest of this dissertation, colonial and postcolonial histories in this region, like those of pre-Hispanic periods, are diverse and cannot be properly contextualized when isolated from spatially continuous pre-Hispanic developments.

Additionally, although I have considered the present to be included within this period, most archaeological studies, whether pre-Hispanic or colonial, do not continue through the present or engage with contemporary political realities (but see Donner 2020). As discussed in Chapter 1, this dissertation posits both that (1) engaging with place-based knowledge held by contemporary community members can improve the rigor of archaeological knowledge production and (2) understanding the contemporary political situations in which community partners and archaeological knowledge production are imbricated, while essential for carrying out ethical archaeological work in any context, is particularly important for realizing the epistemic benefits of archaeological work centered around place-based knowledge, given that the epistemic resources that stewards of place-based knowledge contribute to archaeological investigation are dependent on the continued safeguarding of local traditions of knowledge transmission in place. This idea of conserving places to facilitate future knowledge production is not foreign to archaeology (see, e.g., Lipe 1974). However, archaeologists have seldom given similar consideration to protecting non-Western traditions of knowledge production, which rely on not only the conservation of places themselves, but particular relationships to them. These issues are discussed in terms of Indigenous sovereignty in the next chapter.

Conclusions

In a 1979 article in the *Annual Review of Anthropology*, Olga Linares called for archaeologists working in the hazy, ill-defined region of "Lower Central America" to first determine the social, economic, and political roles of important loci within their local context before attempting to define external relations with Mesoamerica. Unfortunately, the influence of Mesoamerican culture areas continues to loom large, although over the past decade local developments have begun to receive much more scholarly attention. In many cases, this was a direct result of the introduction of communities of practice literature, drawn from educational theory (see Lave and Wenger 1991), into the archaeology of this region, inspired in large part by Rosemary Joyce and Julia Hendon's (2000) work in Honduras (see also Joyce et al. 2014). Rather than attributing similarities in material culture over a large area to cultural diffusion, researchers are investigating how local communities of practice form constellations of practice: networks of local communities that are united by a shared technological strategy for achieving a particular goal (see Dennett 2016, 2021; Donner 2020; Joyce 2021; Navas Méndez et al. 2022; and Chapter 5 of this dissertation).

Even the continued use of the term "Intermediate Area" by the Society for American Archaeology reinforces the teleological notion that the pre-Hispanic societies of parts of Central America were unrealized potential states, "intermediate" between areas where statehood was achieved. As I will discuss in the next few chapters, these misinterpretations continue to have profound consequences for contemporary understandings and dismissals of Indigenous governance and sovereignty in Central America today.

Chapter 3
Archaeology in service of the present: Place-based knowledge and Indigenous sovereignty

Throughout its history, archaeology in the Americas has routinely contributed to the primitivization and essentialization of Indigenous communities, materialized in a Eurocentric discourse and praxis that has been systematically legitimized by scholars and policy makers. This colonial tradition of archaeological knowledge production has enabled anti-Indigenous racism, the desecration of sacred sites, and the dispossession of Indigenous communities (see McNiven and Russell 2005).

Archaeologists have perpetuated a false "vanishing Indian" narrative, with disastrous consequences for Indigenous communities (see Panich and Schneider 2019). In the United States, for example, anthropological scholarship that declared certain communities "extinct" was used by the Bureau of Indian Affairs and other governmental organizations to dispossess Indigenous communities from their ancestral homelands (see, e.g., Kroeber 1925). A similar narrative has been used to disenfranchise Indigenous communities in the Caribbean and Central and South America (Gnecco and Ayala 2011). The links between this discourse, academic knowledge, and power asymmetries are so entrenched that in Argentina, for example, during the 2004 Congreso de la Lengua, scholars proudly announced the "discovery" of surviving Indigenous populations in the northwest part of the country. Indigenous audience members raised their voices in protest arguing that, since they had been there for millennia, they were not sure what was so novel about their presence.

The program of nation-state building resulted in the nationalization of archaeology throughout the Americas. Although enacted differently in different contexts, these state-sponsored archaeologies have continued to divorce contemporary Indigenous communities from their heritage, co-opting it for national narratives and state-governed tourism while denying the rightful inheritors to these material legacies access to their ancestral sites (Díaz-Andreu 2013; Joyce 2003, 2005, 2008, 2013). Archaeology—once again—is instrumental to this matrix of power: cultural resources management archaeology, often paid for by developers, profits from the ongoing commodification of land and the Indigenous dispossession it entails.

Despite this fraught legacy, however, a new paradigm within archaeological scholarship has emerged within the past two decades that aims to radically reshape the relationship between archaeologists and Indigenous communities: Indigenous archaeology. It emerged in Canada and the United States as a direct result of the American Indian Movement, founded in 1968, and other Indigenous-led activism protesting the ongoing desecration of Indigenous cemeteries and other sacred sites in the name of archaeological research (Echo-Hawk and Echo-Hawk 1994). The most significant legal outcome of this work was the passage of the Native American Graves Protection and Repatriation Act (NAGPRA) in 1990, a United States federal law that requires all federal agencies and agencies that receive federal funds to return Native American ancestors and belongings to lineal descendants or culturally affiliated Indian tribes or Native Hawaiian organizations.[14] Although some archaeologists regrettably still oppose the law (see Wade 2021;

[14] I use "ancestors and belongings" here, as it is the preferred language of most Native people in the United States. However, the actual law refers to ancestors as "human remains" and belongings as "(un)associated funerary objects, sacred objects, and objects of cultural patrimony" (United States Public Law 101-601; 25 U.S.C. 3001-3013).

White v. Regents of the University of California 2016), the passage of NAGPRA represented a watershed moment for archaeology's relationship with Indigenous communities (Lippert 2008).

Not long after NAGPRA was signed into law, Nicholas and Andrews (1997: 3) provided the first explicit definition of Indigenous archaeology as archaeology that is "with, for, and by Indigenous peoples," based on papers presented on this theme at the 1994 Canadian Archaeological Association annual meeting. Nicholas (2008: 1660) has since elaborated and specified this definition to refer to "an expression of archaeological theory and practice in which the discipline interacts with indigenous values, knowledge, practices, ethics, and sensibilities." Within the Americas, Indigenous archaeology has received widespread application in the United States and Canada (see Atalay 2006; Colwell-Chanthaphonh 2009; Colwell-Chanthaphonh et al. 2010; Croes 2010; Silliman 2008; Watkins 2000; Wilcox 2009). One edited volume has explored the relationship between Indigenous communities and archaeologists in Latin America, which includes substantial engagement with Indigenous, collaborative archaeology (Gnecco and Ayala 2011). However, it includes no contributions from Central America, which is unsurprising given that Indigenous archaeology has not been employed as an explicit framework in Central American contexts.[15]

This absence of Indigenous archaeology in Central America is problematic because, as part of the mythic construction of the ideology of *mestizaje* in Central America, Indigenous identity—and Indigenous cultural heritage—have been co-opted by nation-states, denying the specificity of place-based relationships that some Indigenous communities maintain to their ancestral sites (de la Cadena 2007; Gould 1998; Joyce and Sheptak 2022). This nationalization of archaeology in Central America has resulted in the denial of plural nationalisms and Indigenous sovereignty over heritage landscapes, as well as exclusion from tourism revenue and from stewardship over archaeological materials (Joyce 2003, 2005, 2008, 2013). Additionally, Indigenous people from Central America are underrepresented as archaeologists in the region due to centuries of socioeconomic oppression embodied in structural inequalities, such as labor market discrimination and lack of educational opportunities (Hale 2005; Yadixa del Valle 2019, personal communication). Indigenous archaeology in this region, therefore, has the potential to be not only ethically sound, but epistemically transformative, by foregrounding the knowledge of Indigenous communities in the interpretation and stewardship of their heritage landscapes.

In the following pages, I outline how an Indigenous archaeology can reshape our historical narratives of this isthmus, drawing on my experience working as an archaeologist with Indigenous, descendant, and local communities in the Darién Province of Panama and the Chontales Department of Nicaragua. Specifically, I frame Indigenous archaeology as an archaeological practice centered around place-based knowledge and Indigenous sovereignty, which I argue are inextricably intertwined.

Place-based knowledge

Drawing on Alfred and Corntassel's (2005: 597) description of Indigeneity as a "place-based existence," TallBear (2013) theorizes the primacy of place in Indigenous articulations of identity and social relationships. The Indigenous knowledge systems that emerge from these

[15] The phrase "Indigenous archaeology" has been used in Central American contexts to describe the relationships that Indigenous communities in the region have cultivated with material traces of the past (Hamann 2002; Mendizábal and Theodossopoulos 2012). While we engage these ongoing relationships in our practice, here I refer specifically to "Indigenous archaeology" as it has been defined by professional Indigenous archaeologists (see Smith et al. 2022).

relationships are thus also place-based (Davidson-Hunt and O'Flaherty 2007; Risling Baldy 2020). In dialogue with TallBear and conversations with community research partners, I use the term *place-based knowledge* to refer to relational ideas and practices that emerge and evolve through long-term human engagements with particular lands and waters. This definition highlights the "-based" part of the phrase, emphasizing that knowledge is created, sustained, and transmitted through continued engagement with a particular place.

Place-based knowledge includes but is not limited to the more commonly referenced Traditional Ecological Knowledge (TEK). The most-cited definition of TEK comes from Berkes (1993: 3):

> Traditional ecological knowledge or TEK is a cumulative body of knowledge and beliefs, handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. Further, TEK is an attribute of societies with historical continuity in resource use practices; by and large, these are non-industrial or less technologically advanced societies, many of them Indigenous or tribal.

An obvious critique of this definition is the author's use of the phrase "less technologically advanced," which reflects Rostow's (1960) view of "technology" as mechanical and production-based. A more anthropological approach instead argues that the practices that constitute TEK or place-based knowledge are themselves advanced technologies. Technologies are not just about making, but also about doing (Franklin 1992; Leroi-Gourhan 1964).

In addition to this conspicuous limitation, Indigenous scholars and community members have taken issue with the term TEK. In Nunavut, for example, many Inuit community members rejected TEK as a descriptor of their traditional knowledge because their ways of knowing encompassed more than the narrow definition of TEK employed by non-Inuit scientists (Wenzel 2004). They thus developed an Indigenous term—*Inuit Qaujimajatuqangit* (IQ)—to describe these teachings, which comes from the verb root *qaujima-* (glossed as "to know") and can be translated as "Inuit knowledge, institutions, or technologies." It encompasses "values, world-view, language, life skills, perceptions and expectations" (Nunavut Social Development Council 1999: 79). Although IQ does extend back to "time immemorial," it is a "living technology" that includes the present and even the future (Arnakak 2000: 1). This statement echoes the future-orientation of place-based knowledge that I discussed in Chapter 1.

I use the term place-based knowledge here, not as a replacement for Indigenous, community-driven terms such as IQ, but as a general category or heuristic concept for such knowledge systems, which should be community-defined and specified within individual projects. It allows common discourse to be established among Indigenous communities, providing structural similarity without generalization, reductionism, or essentialism in content. My choice of this descriptor is inspired by the work of scholars within the field of Native American and Indigenous Studies, particularly their critiques of academic appropriation of Indigenous knowledge. As Watts (2013) points out, Indigenous Knowledge within the academy is often abstracted from its inherent connection to place and employed as metaphor rather than taken literally. Sundberg (2014) also promotes the importance of place-based, situated knowledges and argues that the Western tendency to universalize is inherently colonial. Therefore, I think it is important to foreground the "place-based" nature of the knowledge I document so that it cannot be divorced from its association with a particular landscape and community.

This concept is also inspired by Michi Saagiig Anishnaabe scholar Leanne Betasamosake Simpson's (2016, 2017) explication of *place-based internationalism*, which emphasizes that "place-based" is not synonymous with "isolated"; rather, Indigenous communities have a long tradition of building and maintaining international relationships and constellations of solidarity while remaining grounded in place. A key aspect of place-based internationalisms is that these international relationships, which are often diplomatic relationships tied to law and governance, tend to be negotiated through multiple, overlapping relationships with shared places (see Chapter 4). I also draw on Yellowknives Dene scholar Glen Coulthard's (2014: 60) concept of *grounded normativity*, defined as "the ethical framework provided by these place-based practices and associated forms of knowledge." Betasamosake Simpson (2016: 58) makes clear that all Indigenous place-based internationalism takes place within grounded normativity, therefore involving "plant nations, animal nations, insects, bodies of water, air, soil, and spiritual beings in addition to the Indigenous nations with whom we share parts of our territory." Any discussion of place-based knowledge must foreground the many implications that place-based knowledge has for living in the world, borne out in relations between human communities and between humans and nonhumans.

Because of its intimate engagement with particular sites, archaeological research both depends on and can enhance place-based knowledge, if designed in collaboration with the contemporary heirs to that knowledge. In the context of Indigenous archaeology, those heirs are Indigenous communities. This approach stands to enhance the discipline of archaeology because, as a context-dependent discipline dealing with facts that are almost always underdetermined by evidence (Wylie 2002), archaeologists rely heavily on place-based knowledge. And while Indigenous communities still hold and steward an abundance of place-based knowledge, it has often been a particular target of cultural genocide (see Lopez 2013). Therefore, collaborative archaeology can support communities in collecting, interpreting, and rethinking crucial knowledge that has been temporarily forgotten by human communities but is still held by the land itself.[16]

Place-based knowledge and Indigenous sovereignty

Indigenous sovereignty is essential for sustaining place-based knowledge. Because this knowledge is relational, Indigenous communities must be able to steward their ancestral lands to engage it. Therefore, Indigenous sovereignty entails the interconnected protection of land, knowledge, and culture (see Moreton-Robinson 2020).

This ongoing engagement with place-based knowledge is, in turn, essential to the success of ecological conservation efforts. Despite the leadership role that Indigenous communities play in these endeavors by virtue of their long histories of landscape stewardship, controversies in many nations have emerged in areas of overlap between Indigenous territories and national parks, including in Panama. In Panama's Darién Province, where I work, a simulation examining changes in forest cover within Darién National Park and two Indigenous Emberá territories in the same area, Cémaco and Sambú, found that the legal protection of Cémaco and Sambú resulted in more significant prevention of deforestation than the national park (Nelson et al. 2001). A more

[16] While specifying a particular approach to collaborative archaeology is not the focus of this chapter, I am interested here in the upper end of Colwell-Chanthaphonh and Ferguson's (2008: 1) "collaborative continuum," in which "the contributions of community members and scholars create a positive result that could not be achieved without joint efforts."

recent study of deforestation rates from 1992 to 2008 throughout all of Panama also found Indigenous land tenure effective at preventing deforestation. However, Indigenous leaders were less effective at preventing deforestation in areas where Indigenous-claimed lands overlap with national parks—in other words, areas where Indigenous sovereignty is disputed (Vergara-Asenjo and Potvin 2014). Indigenous models of common property holding that are legally recognized by the state have also been shown to prevent deforestation in Bosawas, Nicaragua (Hayes and Murtinho 2008) and the Brazilian Amazon (Nepstad et al. 2006).

Therefore, one promising strategy for combating deforestation in tropical forest environments, while also protecting place-based knowledge and upholding human rights as outlined in the United Nations Declaration on the Rights of Indigenous Peoples (2007), is supporting Indigenous-led efforts for affirming sovereignty.[17] In the sections that follow, I describe the Indigenous political landscape of Nicaragua and Panama. I discuss how archaeology is implicated in national politics and how those politics affect Indigenous communities in both countries. I also offer some thoughts on how the archaeological projects I have been involved in either have or could employ archaeology in the service of Indigenous sovereignty.

The Indigenous political landscape of Panama

The Republic of Panama consists of ten provinces, administered by the national and provincial governments, and six legally established Indigenous territories, called *comarcas*: Guna Yala (established 1938, finalized in 1953), Emberá-Wounaan (established 1983), Guna de Madungandí (established 1996), Ngöbe-Buglé (established 1999), Guna de Wargandí (established 2000), and Naso Tjër Di (established 2020). Comarcas are semi-autonomous regions that recognize Indigenous claims to ancestral lands (Herlihy 1995). They are internally regulated by Indigenous systems of governance, under the jurisdiction of the national government. The comarca system was created through a process known as Panama's quiet revolution (Herlihy 1995), a series of negotiations that followed the successful Guna Revolution of 1925, in which the Guna revolted against the Panamanian police and government to protest national policies of forced assimilation. Although Guna Yala was established much earlier, the right of other Indigenous communities to establish comarcas was not legislated until the ratification of the Constitution of 1972, Article 127, which guarantees Indigenous communities the right to collective ownership of lands.

Although all comarca governance structures are ostensibly recognized as legitimate and final authorities within their territories, sovereignty in practice is highly variable among the six comarcas, as each was formed by a unique charter. Additionally, comarca boundaries do not necessarily reflect Indigenous concepts or cartographies of land tenure, as described below. Even though the land of all six comarcas is inalienable and cannot be segregated, management of subsurface—and in some cases, surface—resources is carried out entirely by the national government, with implications for mining, groundwater, and buried cultural heritage, for example (Herlihy 1995; Herrera 2012; Velásquez Runk 2012).

[17] A rights-based approach to conservation was implemented in the 2003 Durban Accord (IUCN 2003). This new paradigm emerged as a response to the old conservation models for protected areas, which excluded human rights and well-being of local populations, creating social conflict and threatening long-term sustainability. In contrast, the rights-based approach to conservation works towards more pluralistic governance and management of protected areas, which respects the rights of Indigenous Peoples and other local communities (Pelletier, Gélinas, and Potvin 2019).

Tierras colectivas is a secondary designation of Indigenous lands first proposed by the 31 of 53 Emberá and Wounaan villages that were excluded from incorporation into the Comarca Emberá-Wounaan in the 1980s, after they were told by government officials that no new comarcas would be created (Koller-Armstrong 2008; Velásquez Runk 2012). However, it was not until Law 72 passed in 2008 that a procedure was established for awarding the collective ownership of lands traditionally occupied by Indigenous communities that fall outside of the existing comarcas. While these lands are inalienable under Article 9 of Law 72, they are not semi-autonomous (Martínez Mauri 2011); the law states only that governmental and private entities will coordinate with Indigenous leaders to plan development and resource use and does not cede any control to traditional authorities.

Law 72 was specifically intended to replace demands by Naso people for full recognition as a comarca, as the national government hoped to push through construction of a hydroelectric dam in Naso territory (Herrera 2012). Unsurprisingly, the Naso took issue with this legislation, as they felt that it allowed the government to appear to support Indigenous rights, without any real concession to Indigenous governance (Quintero De León 2008). Additionally, there have been delays in implementation; the first tierras colectivas titles were not awarded until 2012, and only five titles were awarded between 2012 and 2018. As of 2018, 24 tierras colectivas remained untitled, most of which are in Darién Province and overlap with national parks or other state-administered "protected areas" (Halvorson 2018). The national government has used these overlaps with national parks—among other arguments—to justify the denial of applications for collective land titles.

Many Indigenous communities in Panama have no recourse to legal protection under either comarca or tierras colectivas status. As a result, they reside in and utilize ancestral lands and waters without title to these places, which entails considerable risk (Velásquez Runk 2012). For example, *áreas anexas*—areas adjacent to comarcas that have been annexed but not yet legally incorporated—exist in legal limbo; they administratively belong to the provinces, so Indigenous communities do not hold any land titles or use rights. As of 2018, communities annexed to the Comarca Ngöbe-Buglé had been waiting since 1997 for the legal demarcation of their boundaries, during which time two hydroelectric projects were completed.[18] Still other Indigenous ancestral lands remain entirely unrecognized as such, including the Emberá community of Mogue, with whom I collaborate.

Complicating this situation further, Mogue and other Emberá communities have experienced an acute transition in their way of life over the past half century. The Emberá have traditionally engaged in seasonal mobility.[19] Over the last sixty years, however, their movements have been circumscribed by a combination of state policy oriented to establish permanent villages and encroachments on traditional lands, which have typically led to forced resettlements in new, significantly smaller territories (Finley-Brook and Thomas 2010; Wali 1989). While this governmental reorganization and dispossession did not explicitly prohibit nomadic practices, it often forced people to move out of their ancestral lands, severing ties to the place-based knowledge enacted through seasonal movements.

[18] Law 10 of 1997 stipulated that this boundary mapping must be completed within 20 months, a regulation that has consistently been ignored (Arghiris 2018).

[19] The dichotomy that archaeologists and anthropologists often draw between nomadism and sedentism (and gathering-hunting and agriculture) is recognized to be an evolutionist oversimplification, as well as historically and presently inaccurate (see Cribb 1991).

Additionally, many communities were justifiably concerned about leaving parts of their territory for months out of the year, leaving them unoccupied and undefended to be seized by settler colonists (Herlihy 1989). Because Panama permits settlement on "unexploited" national land (including unrecognized Indigenous land) to promote agriculture, deforestation has been used by settlers to claim rights of possession, which is legally recognized by the national government (Heckadon Moreno 2009; Wali 1993). On a legal level, many Emberá communities felt that they had no choice but to abandon their traditional settlement patterns in favor of a sedentary village lifestyle because it was legible to the Panamanian nation state; otherwise, they would risk losing what remained of their homelands (Herlihy 1986).

This inherent disjunct between the legal definition of property ownership according to the Panamanian nation state and Emberá conceptions of land stewardship have surfaced during our collaboration with the Emberá community of Mogue. For example, Mogue's engagement with the land does not necessitate deforestation or continuous cultivation. While this choice demonstrates the community's commitment to ecological stewardship, it opens the land up for settlers to claim rights of possession according to Panama's agrarian code described above. And while I unequivocally support Mogue in its efforts for recognition of sovereignty, in part through land claims, Indigenous land titling has often been co-opted by settler colonial states as a way to cede minimal territory while affirming state authority (Coulthard 2014). Additionally, the costs of land titling and subsequent taxation, together with the systematic misinformation around them, pose a paradoxical threat of dispossession through the legal concession of land (Velásquez Runk 2012; see also Gould 1998 for similar examples from Nicaragua).

As my preliminary archaeological work demonstrates, the history of what is now Mogue is dynamic, troubling any attempt to cleanly delimit borders and boundaries. Rather than treating this as evidence against Mogue's historicity or continuity, I argue that this evidence of historic and contemporary place-based internationalism, illustrated through monuments to inter-Indigenous relationships in the landscape (see Chapter 4), supports Mogue's claims to sovereignty, while also illustrating the ongoing need to uphold Indigenous legal and political traditions that reimagine human relationships to place.

Mogue is located on the northern shore of Río Mogue, which feeds into the Gulf of San Miguel. According to various community members, Mogue was permanently settled towards the end of the 1800s or was settled many generations ago (Cahn 2004). From the 1930s to the 1950s, the land was seized by the owners of a coconut plantation called Patinio, although the Emberá inhabitants were able to continue living there without incident. In the 1950s, however, the plantation owners shifted their primary economic focus to cattle ranching, which involved extensive use of slash-and-burn agriculture and therefore heavy deforestation, impacting the community of Mogue's access to important resources and soil fertility. The ownership of Patinio also started to claim progressively more land, including the land of the village of Mogue itself, and tried to limit usage of natural resources on the plantation. In the 1970s, the Panamanian government seized Patinio because of a failure to pay taxes, but it was immediately encroached on by other settlers claiming rights of possession under agrarian legal codes (see Heckadon Moreno 2009; Wali 1993). In the 1990s, the former plantation was bought by Ancón, a conservation non-governmental organization that prohibited community members from farming, fishing, or hunting (Cahn 2004). The organization offered Mogue only 1,482 acres of the 75,000-acre plantation, which the community has argued is inadequate to ensure their food security. As of 2022, Ancón had still not clarified the location of this acreage to community leadership (Congreso Local de Mogue 2022, personal communication).

Mogue applied for collective title under Law 72 to the entirety of its ancestral land base, as mapped by the community. However, they were denied this title because the request "failed to follow administrative procedure," after it was stalled due to an overlap with governmentally managed protected areas (ANATI 2018). In 2019, the Ministerio de Ambiente passed Resolution No. DM-0612-2019, which includes a stipulation that Indigenous communities can claim title to territories that overlap with state-owned protected areas. The passage of this resolution led to the Supreme Court's 2020 declaration that Law 656 of 2018, which created the Naso comarca, was not in fact unconstitutional on the grounds of overlaps with protected areas, the justification for its veto in 2018 by then-President Juan Carlos Varela (Kennedy 2021). Therefore, Mogue is now eligible to resubmit its case to the Autoridad Nacional de Administración de Tierras (ANATI), and title can no longer be denied based on these overlaps.

Archaeology and Indigeneity in Darién, Panama

I entered this complicated sociopolitical landscape in 2019, during the pilot season of Darién Profundo, the collaborative project I co-direct with Natalia Donner (Leiden University), Tomás Mendizábal (Asociación de Interés Público Centro de Investigaciones Históricas Antropológicas y Culturales), and the Indigenous and Afro-descendant communities of Mogue, Garachiné, Yaviza, Sansón Arriba, El Real de Santa María, Chepigana, La Palma, and Guayabillo. The project name comes from a statement made by our collaborator Noé Alvarado, a *Darienita*, former Olympic athlete, politician, and radio host, who described to us the deep but unadorned and underappreciated history of Darién (2019, personal communication). In response, we founded the project to create the first archaeological chronology of the province. This is particularly important given the link between this so-called "archaeological gap" (the result of a lack of study, not a lack of archaeological sites; see Chapter 4) and the imagined geography of Darién as a people-less place, a narrative that has proved fundamental in settler colonial narratives concerning "development" (Velásquez Runk 2015). In Mogue, for example, we documented archaeological and other sites, for research purposes and also for the land claims process, which, as described above, necessitates submission of detailed maps adhering to legal standards that include evidence for historical occupation. Therefore, the chronological component of our work is particularly important.

Both Donner and I came to this work from previous research projects in Nicaragua, whose national discourse of pre-Hispanic history emphasized an unsubstantiated invasion by Nahuatl speakers in the 9th century CE (see next section). This event supposedly wiped out the entire Indigenous population prior to the Spanish invasion, which has been used by nationalist governments to negate claims to cultural continuity and place-based knowledge, thereby justifying present-day Indigenous dispossession.

Echoes of this narrative are also present in stories of the Panamanian "Cueva," who supposedly were exterminated by 1535 as a result of the Spanish invasion (Sauer 1966). Linguistic research now suggests that the Cueva language—the supposed identifying trait of the Cueva culture/people, less than 60 words of which were ever recorded (de Oviedo y Valdés 1959 [1526])—was a lingua franca that facilitated relationships among different Indigenous communities, especially between Chibchan and Chocoan linguistic families in Darién, and was not a political or even linguistic group (Cooke 2015; Cooke and Sánchez Herrera 2004). Additionally, the documented Cueva words include cognates with historic and modern Guna and Wounaan (Constenla Umaña 1991; Loewen 1963; Romoli 1987). However, archaeologists and biological anthropologists have continued to refer to the "extinction of the Cueva" immediately

after Spanish colonization (Hoopes and Fonseca 2003: 56; see also Barrantes et al. 1990: 66). The explicit implication is that contemporary Indigenous communities are more recent arrivals to Darién and not *pueblos originarios*,[20] as people from Mogue and other Indigenous communities in the region refer to themselves. This perpetuated myth of complete Cueva disappearance is an example of archaeology's role in creating and reinforcing the harmful narratives of "vanishing Indians" described above, which can have real political consequences for contemporary Indigenous communities whose sovereignty is contested by the nation-state.

The Indigenous political landscape of Nicaragua

Despite the direct implication of pre-Hispanic archaeology in contemporary Nicaraguan national politics, archaeological projects in the country have tended to either remain politically agnostic or, in the case of projects directed by the Frente Sandinista de Liberación Nacional (FSLN)-led Dirección de Arqueología, explicitly uphold nationalist discourse (see Chapter 1). Therefore, although Donner and I worked in the province of Chontales for three years, spending almost an entire calendar year in the field, I understood little about contemporary Nicaraguan politics and their intersection with Indigenous politics. However, after the events of 2018 described in Chapter 1, I was motivated to learn more about Nicaraguan politics, particularly as they concern Indigenous communities, to better inform my ongoing zooarchaeological analysis of pre-Hispanic (Indigenous) material culture (see Chapter 5) and to consider future plans of work in the country.

Despite pervasive narratives of Indigenous disappearance, Nicaragua's recognition of Indigenous and Afro-descendant land rights has been hailed as a model for other Latin American nations to follow. In 1987, the FSLN-controlled national government signed Law 28 (Statute of Autonomy of the Regions of the Caribbean Coast of Nicaragua), an agreement with Indigenous and Afro-descendant leaders that recognized communal lands and created two multi-ethnic autonomous regions: the North Atlantic Autonomous Region (RAAN) and the South Atlantic Autonomous Region (RAAS) (Finley-Brook and Offen 2009; Mittal 2020).

However, this came after years of expropriation of lands by the FSLN, who, despite their zeal for state-sponsored cooperatives, did not respect Indigenous systems of collective land governance developed over millennia (Kinzer 1991). Indigenous communities protesting the invasion of their lands by what they saw as another group of Spanish elites were subjected to police violence and arrested as political prisoners. In 1982, to prevent Indigenous organizing, the FSLN sent troops into the Miskito region of northeastern Nicaragua to kidnap residents and forcibly remove them from their homelands, burning their villages to the ground, killing their animals, and destroying their crops. The FSLN government later admitted that more than one hundred Miskito people were also murdered during this campaign. Although most Miskitos had already been forcibly removed or escaped across the border to Honduras, the FSLN continued using mortar fire and aerial bombardment throughout the 1980s to punish all villages in the Miskito region they believed were harboring guerillas, jailing hundreds of civilians. Sumo communities in north-central Nicaragua and Rama communities off the Atlantic coast were treated similarly, their towns invaded and community members kidnapped and killed on suspicion of opposing the FSLN. Many sources refer to the 1980s as a "period of war," followed by the negotiated 1987 settlement that conferred autonomy, but journalistic accounts make clear

[20] "Original peoples," a term often used by Indigenous communities in Central America that is similar to the concept of First Nations.

that these were not battles but invasions carried out by a nationalist military against civilians. Despite this unprovoked and one-sided violence, Indigenous resistance was consistent enough that the FSLN realized they could never quell protests with brute force, which led to the 1987 settlement.

However, even after autonomy was granted, it was not respected. Successive governments continued to violate the law by granting rights to corporations seeking to exploit the region's natural resources without agreement by the local communities or regional governments (Mittal 2020). In 1995, the national government approved a logging concession to the Korean company SOLCARSA within the traditional territory of Awas Tingni, a Mayanga community located within the autonomous region of RAAN, without even informing the community (Anaya and Grossman 2002). When SOLCARSA agents started trespassing on their lands, conducting an inventory for the proposed logging, the community filed a petition for *amparo* (emergency relief), alleging violations of the 1987 law. The Nicaraguan judicial system did not grant an injunction, so Awas Tingni petitioned the Organization of American States Inter-American Commission on Human Rights, alleging violations of the right to property and the right to cultural integrity as defined in the American Convention on Human Rights, to which Nicaragua is a party (Anaya 1996-1997).

After additional national legal actions involving Awas Tingni and the Regional Council of RAAN, the Nicaraguan Supreme Court ordered the nullification of the concession (Anaya and Grossman 2002). However, in the course of these proceedings, the Regional Council of RAAN demonstrably did not respect the sovereignty of Awas Tingni,[21] and the community recognized the necessity of official recognition of its specific territory, proceeding with its claim through the OAS Commission. Finally, in 2001, the Inter-American Court of Human Rights found Nicaragua in violation of the American Convention on Human Rights, as well as its own Constitution and national law, ordering Nicaragua to demarcate and title Indigenous lands. This process was codified in the 2003 "Law of Communal Property Regime of the Indigenous Peoples and Ethnic Communities of the Autonomous Regions of the Atlantic Coast of Nicaragua and of the Rivers Bocay, Coco, Indio and Maíz" (Law 445), and Awas Tingni finally received its title in 2008 (Anaya 2009; Mittal 2020). This case set an important precedent for Indigenous sovereignty throughout the Americas and the world, as it was the first case in which an international tribunal with legally binding authority found a government in violation of the collective land rights of an Indigenous community. It also illustrated that the Nicaraguan national government, whether controlled by the Partido Liberal Constitucionalista (PLC) or the FSLN, continued to disrespect Indigenous sovereignty, even if it meant violating its own laws, as well as national and international constitutions.

Although Daniel Ortega was not in office when Law 445 was approved, pledging to move forward with the titling process was a tenet of his successful 2006 presidential campaign, and between 2006 and 2020, the Ortega government granted legal titles to 23 communities in RAAN and RAAS, representing 31% of the nation's territory (Mittal 2020). However, these titles did not prevent gold mining, logging, and agroindustrial interests from continuing to occupy these lands illegally. These occupations have not only continued to prevent the

[21] After the Supreme Court decision, the national government went directly to the Regional Council to seek post hoc ratification of the concession and managed to secure enough votes to pass the measure, despite the fact that the Council, at the request of Awas Tingni, had filed the initial lawsuit against the concession (Anaya and Grossman 2002).

supposedly autonomous Indigenous and Afro-descendant communities from exercising sovereignty over their ancestral territories but have directly resulted in fires, injuries, and deaths.

Despite their legal success in the Awas Tingni case, since 2015, approximately 60% of Mayanga territory has been illegally invaded, displacing about 3000 Indigenous inhabitants (Associated Press 2023). Between 2015 and 2020, at least 40 Indigenous people in the Atlantic Coast region were killed, 47 injured, 44 kidnapped, and 4 disappeared, all directly related to land invasions carried out by armed men, who also use arson as a tactic to force displacement (Hurtado 2020). Between 2020 and 2022, at least 28 Mayanga and Miskito leaders were murdered because of their roles as land defenders. In March of this year alone, arson destroyed all of the homes in the Mayanga community of Wilu, and at least five Mayanga people were killed (Associated Press 2023). Because these attacks are often carried out by former soldiers, there are few arrests, and the Ortega regime has actively encouraged these illegal national and international mining and logging settlements through financial incentives (Associated Press 2023; Mittal 2020). Thus, despite the relatively substantial legal recognition of Indigenous sovereignty on the Atlantic Coast, communities continue to be violently persecuted for exercising their legal rights, leading many community members to flee their ancestral lands, which has coincided with a doubling in the deforestation rate between 2010 and 2015 (Hurtado 2020).

Archaeology and Indigeneity in Pacific and Central Nicaragua

Although RAAN and RAAS are the largest territorial divisions in Nicaragua, together comprising 46% of the total land area, Indigenous communities in the other 54% of the country have been systematically written out of history. The nationalist history of Pacific Nicaragua is premised upon two hypothetical invasions of Nahuatl speakers from Central Mexico in 800 and 1250 CE, who supposedly entirely displaced existing Indigenous populations. This narrative has inspired much of the archaeological work in the region, and although archaeologists have been unable to substantiate this migration over decades of work, it has continued to color archaeological interpretation. For example, material culture from 800 to 1250 CE found in Pacific Nicaragua continues to be described by researchers as associated with the "Chorotega culture" and "Chorotega migrants," a name coming from Spanish colonial sources and believed by some to be derived from the Nahuatl word *Cholōltēcah*, meaning "inhabitants of Cholula" (see Carmack and Salgado González 2006; Healy 1980; McCafferty 2008, 2015; McCafferty and Dennett 2013; McCafferty and McCafferty 2008; McCafferty and Steinbrenner 2005; Niemel 2003). However, researchers have consistently documented significant differences in material culture between Pacific Nicaragua and Cholula (McCafferty and Dennett 2013; McCafferty 2015; Steinbrenner et al. 2021). Dennett's work (2016, 2021) represents the most significant technological ceramic analysis efforts in the region and clearly suggests evidence for local manufacture and continuity in the configuration of economic networks, despite their expansion.

These differences are substantial; investigations in Pacific Nicaragua encountered no evidence for *comales*,[22] which comprise about 20% of rim sherds at Cholula (McCafferty 2001; McCafferty and Dennett 2013). Paleoethnobotanical analysis of carbonized seeds, residue, and phytolith assemblages from Pacific Nicaragua have also not encountered maize (*Zea mays*), the most consistent feature of Cholulan diet, despite its identifiability and generally good preservation in archaeological contexts (Alcantara-Russell 2020; McCafferty and Dennett 2013).

[22] Wide, shallow griddles associated with tortilla production in Mexico.

Zooarchaeological investigations in the region have also failed to encounter the typical Mesoamerican domesticates of the turkey (*Meleagris gallopavo*) and dog (*Canis lupus familiaris*; McCafferty 2015). Architectural styles and mortuary and other ritual practices are also distinct between the two places. Incidentally, comales have recently been identified in the archaeological record in Central Nicaragua, but technological analysis suggests local techniques and manufacture, and starch analysis suggests that they were used for processing manioc (*Manihot esculenta*) and chili pepper (*Capsicum* sp.), as well as maize (Ciofalo et al. 2020; Donner et al. 2019).

Interestingly, the only studies of Mangue (the language spoken by communities of theoretically "Chorotega" descent in Pacific Nicaragua) conducted with living speakers of the language propose a different etymology for the term "Chorotega," also of Nahuatl origin but unrelated to Cholula:

> They were of one blood and one language, and called themselves *Mánkeme*, rulers, masters, which the Spaniards corrupted into *Mangues*…the Aztec Nicaraguans applied to them the opprobrious name, *Chololteca*, 'those driven out', from the Nahuatl verb *choloa*, in its compulsive form *chololtia*, and the suffix, *tecatl*, people; which was corrupted by the Spaniards into *Chorotegas* (Brinton 1886: 240).

Lothrop (1926) presented yet a different plausible etymology, observing that the term "Chorotega" is first used in writings associated with the expedition of Gil González Dávila, who often named languages for the first *cacique* (chief) he encountered who spoke that language. Chorotega was the name of the first regional cacique that González Dávila met, in what is now Costa Rica. This origin could explain why, although they identify first with their community, as Matambugueños, members of the Costa Rican Indigenous community of Matambú do also identify as "Chorotega Indigenous people" (Stocker 2000:10), whereas I have not been able to find a single reference in which formerly Mangue-speaking Indigenous communities in Nicaragua identify as Chorotega. They exclusively identify with their communities (e.g., Monimboseños; Gould 1998). Whatever the etymology, there is no archaeological evidence of large-scale population displacement of Indigenous Nicaraguans by people from Central Mexico, and Indigenous communities in Pacific Nicaragua today do not refer to themselves as Chorotegans (see Field 1999; Gould 1998)

So why does this story persist in archaeological scholarship? The continued tacit endorsement of nationalist, ethnohistoric myths only vaguely suggested by colonial sources is likely the result of both the intentional erasure of Pacific Indigenous history and politics at the national level (see Field 1998; Gould 1998), as well as the lack of engagement by archaeologists with the sources that do exist on these issues, including Indigenous political institutions that persist today. According to census data, Indigenous Nicaraguans comprised 32% and 55% of the population in 1846 and 1870, respectively (Gould 1998). During the 1890s, Indigenous Nicaraguans represented 30.7% of recorded births and 35% of deaths, not including the so-called *indios bravos* of Central Nicaragua who remained outside of colonial control, putting the Indigenous population of Pacific and Central Nicaragua at around 40% in 1900. At this point, however, census records become extremely misleading; the 1920 census failed to document a single Indigenous person in the mostly-Indigenous communities of Sutiaba and Masaya, or in 11 of the 13 official *Comunidades Indígenas*,[23] suggesting that the population of Indigenous people in Nicaragua had suddenly dropped from 40% to 4%. However, internal membership records of

[23] Indigenous governments with collectively managed lands, recognized by the Spanish Crown.

the Comunidades Indígenas suggest that 15 to 20% of Nicaraguans were enrolled in one of these official organizations, an undercount of the actual Indigenous population.

Gould (1998) attributes this intentional undercounting (I return below to how exactly this happened) and lack of recognition of Indigenous governance to the national government's justification of the expropriation of communally held Indigenous lands. Yet, despite eight attempts to abolish the Comunidades Indígenas between 1877 and 1923, these Indigenous-led organizations persist today, forming the Federación de Comunidades Indígenas in 1992. The most recent national census, taken in 2005, although relying on the same flawed ethnohistoric constructs as archaeological research, records 92,304 people identifying as Pacific or Central Nicaraguan Indigenous groups, with 46,002 selecting the category of "Chorotega-Nahua-Mange" (Instituto Nacional de Información para el Desarrollo 2005).[24] Notably, the census does not record whether citizens are enrolled members of Comunidades Indígenas—the recognized Indigenous governments who negotiated treaties with the Spanish—only whether individuals identify with these imposed and assumption-laden pseudo-cultural (and nonpolitical) categories.

One of the mechanisms used by the national government to justify a lack of engagement with the Comunidades Indígenas and deny the existence of Indigenous people in Pacific and Central Nicaragua altogether was to draw a clear break between past and present, to make Indigenous political rights conditional on arbitrary markers of Indigeneity like language, dress, and religious practice—conveniently, the practices most intensively targeted by Spanish enslavement and displacement—and, not finding them, question the legitimacy of the Comunidades (Dore 2006; Gould 1998; Newson 1987). This imposed colonial distinction between culture and governance has persisted, with ongoing consequences for Indigenous sovereignty, even in political climates that were friendlier to "cultural" expressions of Indigenous identity. For example, Ernesto Cardenal, the Minister of Culture under the FSLN government from 1979-1987, directed efforts to revitalize Indigenous weaving and helped to found a small museum in the Indigenous community of Sutiaba (Gould 1998). At the same time, the national government did not recognize the political authority of the Comunidades Indígenas, treating them merely as cultural heritage organizations, subordinate to the national government. As Juan Ochoa, the first president of the Comunidad Indígena of Matagalpa during the FSLN government, put it: "It was hard for the authorities to accept the fact that we had our own laws…They tried to manipulate us, saying that the laws were against the ideology of the Frente Sandinista, but we did not accept that" (interview with Juan Ochoa, cited by White 1993: 52). In failing to engage with the contemporary Indigenous political landscape of Nicaragua, archaeologists have unintentionally perpetuated this same rupture: Indigenous communities are reduced to their ancestral "cultural" attributes, decoupled from their ongoing political, land-based relationships, and thereby disappeared in society, while their heritage graces the national currency.

This rupture has had deadly consequences. As part of the violent repression instigated by the Ortega regime in 2018 (see Chapter 1), police and paramilitary groups launched a series of attacks on the neighborhood of Monimbó in Pacific Nicaragua, shooting indiscriminately at houses and killing dozens (Associated Press 2019). Vice President Rosario Murillo, who is also Ortega's wife, described the operations as necessary "cleaning," portraying the Monimboseños as "coup plotters, few in number, malignant, sinister, diabolical, satanic and terrorists." Even in

[24] 443,847 people identify as Indigenous in the entire country, comprising 8.6% of the total population (Instituto Nacional de Información para el Desarrollo 2005).

the context of the 2018 repression, in which hundreds of people were murdered and thousands arrested, this type of offensive attack on civilians was unusual. The news articles reporting on this event fail to note that Monimbó is a Comunidad Indígena (originally Mangue speaking) and was the location where the Federación de Comunidades Indígenas was formed in 1992. In this context, Murillo's comments are seen to be ethnically coded, and the particular threat that the sovereignty of this community poses to the national government's authority becomes clear. However, because of the success of the nationalist "myth of mestizaje" in Pacific Nicaragua (Gould 1998), the political context of this attack was not understood by the international community, and human rights and inter-Indigenous organizations have not responded with the same force as they have to murders of community leaders in the Atlantic region, who are clearly understood to be Indigenous.

Field's (2009) ethnographic work with San Juan de Oriente, an ancestrally Mangue community only 7.7 kilometers from Monimbó and famous for their traditional pottery production, briefly discussed the importance to community members of the pre-Hispanic ceramics they find in their community while farming and during construction, which they identify as created by their ancestors. This is just one example of a potential opening for collaborative, Indigenous archaeology in this context that could emerge from community interest and concern. By starting from the present-day sociopolitical reality of the contemporary heirs to the sites we are investigating, we avoid capping "archaeological time" at some point in the past, allowing for the production of knowledge about the past in dialogue with knowledge held in the present, oriented towards the future. Otherwise, we stand only to abet the rhetorical distancing of contemporary Indigenous communities from pre-Hispanic and more recent histories, which has allowed the national government to continue an agenda of state-sanctioned genocide against Pacific Nicaragua's Indigenous communities without reproach.

Conclusions

This chapter reflects on the requirements for conducting Indigenous archaeology in aggressively anti-Indigenous political landscapes, drawing on my experiences working as an archaeologist with communities and Indigenous heritage in Panama and Nicaragua. If as archaeologists we are serious about engaging in archaeology with, for, and by Indigenous communities, our goal should most often be the enhancement of existing, community-based relationships to places and associated place-based knowledge. But achieving this requires that we first understand how the community we work with is constituted politically and then recognize their sovereignty on their own terms. To do this, we must also understand the various institutions that are working to erode that sovereignty and how cultural heritage is implicated in these negotiations.

If we see Indigenous communities as they are—as sovereign nations engaging in historical projects of international politics—then archaeology can be an important tool for communicating with colonial political-legal institutions (see Chapter 6). However, if we ignore the settler-colonial political context that permeates all archaeological work on Indigenous heritage in the Americas,[25] it is easy for archaeological knowledge to be co-opted for nationalist agendas, because archaeology developed from the same intellectual tradition as settler-colonial law (Martindale and Armstrong 2019). Therefore, as archaeologists working with Indigenous

[25] This context likely applies to other settler-colonial contexts as well, but as I am mostly drawing on Native American Studies scholarship, I will restrict my scope to the Americas.

heritage, we have a responsibility to counter the colonial foundations of our discipline by designing archaeological work grounded in the affirmation of Indigenous sovereignty, which itself sustains the place-based knowledge held by community partners long into the future, enabling further study and understanding of histories written into the landscape. This chapter focused on the ethical imperatives of this approach; I take up its epistemic benefits for archaeology as a discipline in subsequent chapters.

Chapter 4
Archaeological survey as participatory counter-mapping: Indigenous sovereignty and epistemic change in Darién, Panama

Collaborative and community-based research methods have recently gained ground in archaeology primarily for their ethical merits, an essential shift for a discipline structured by and complicit in colonialism. However, the "dynamic pluralisms" that collaboration can engender—in which archaeologists engage the knowledge held by community partners to inform archaeological practice—also have significant epistemic value for archaeology as a discipline (Wylie 2015: 195). In this chapter, I argue that co-designing research with community members, based on both archaeological and community knowledge, has not only ethical but also profound epistemic consequences, especially for phases of archaeological research often dismissed as unscientific, such as purposive survey (also commonly referred to as "prospection").

My research in the Darién Province of Panama proceeds from interlinked efforts in support of Indigenous sovereignty, ecological sustainability, and archaeological scholarship in the region, all of which have been negatively impacted by the conceptualization of the region as a "gap" in terms of human settlement (see Chapter 3). Despite the 145 archaeological sites that we documented during one field season in 2019 through pedestrian survey and archival research, Darién is often portrayed as a blank space on archaeological maps of Panama (Figure 3; see Donner, Gill, and Mendizábal 2019 for complete site descriptions). Maps showing only one site in the entire province were common in the literature until recently (Velásquez Runk 2015), and only 15 sites appear in the most updated scholarly map, itself the result of considerable synthesis of unpublished historical literature (Mendizábal et al. 2021).

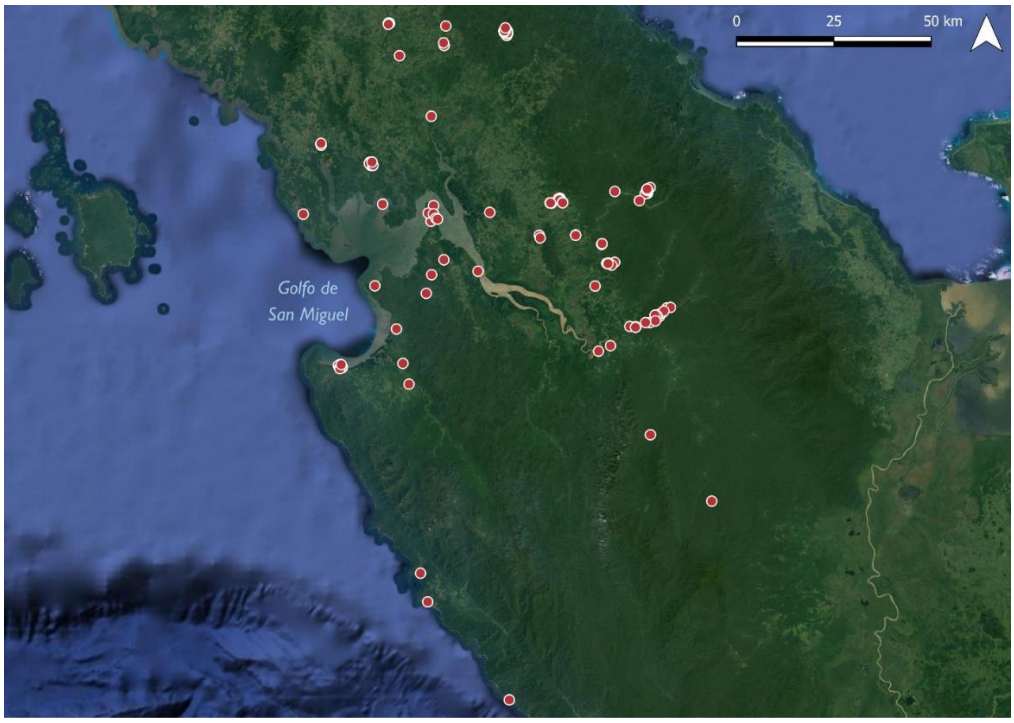

Figure 3. The archaeological sites we documented in Darién in 2019 (n=145), both from surveys of unpublished literature and archaeological prospection.

This self-sustaining void of archaeological scholarship has posed problems for Indigenous communities seeking to claim titles to their ancestral lands (Velásquez Runk 2012, 2015), because the national government can easily deny that their occupation could have any significant time depth in such a "no-man's land." This dispossession prohibits Indigenous ecosystem stewardship and facilitates the encroachment of extractive industries, even in ostensibly protected areas.

In this context, especially given the low visibility of this tropical forest environment and lack of systematic previous research, employing a robust purposive survey design as an initial phase of research is essential. This type of survey, in contrast to statistical (sampling) survey, has long been denigrated as unscientific by archaeologists drawing on the processual tradition (but see Banning 2002). Such initial stages of research have likewise been little treated by the collaborative archaeology literature. Nominal collaborations between archaeologists and local "informants" have been commonplace in the poorly described but widely practiced tactic of ethnographic survey, but these approaches suffer both ethical and epistemic deficits, because the knowledge of local communities is typically applied extractively to research questions and aims determined by archaeologists (Sanjek 1993).

To rectify these issues, my co-director and I developed an approach to archaeological survey in collaboration with local communities, based on their place-based knowledge of cultural landscapes, so that Indigenous knowledge not only supplied the information guiding our survey, but also determined the research questions and objects of analysis that survey sought to explore. In this chapter, I draw on Indigenous archaeologies (Atalay 2006; Nicholas 1997), archaeological ethnography (Brady and Kearney 2016; Hamilakis 2011, 2016), community-based participatory research (Atalay 2012; Strand et al. 2003), and a longstanding tradition of Indigenous-led participatory mapping in the Darién Province of Panama to theorize archaeological survey as the mapping of landscapes of place-based knowledge.

Our approach has yielded significant results for archaeological scholarship (in the form of many newly mapped sites and enhanced understandings of sociopolitical interactions and technological developments), as well as contemporary ecological stewardship (monitoring programs) and Indigenous sovereignty (mapping of traditional lands and cultural landscapes, and even indirect effects related to COVID-19 public health response). These benefits derive ultimately from the Indigenous place-based knowledges held by many communities around the Gulf of San Miguel, whose traditional landscapes overlap and interpenetrate, as do our community-based survey areas.

By surveying landscapes of place-based knowledge in collaboration with the communities that steward them, I aim to bring archaeological prospection closer to internal consistency of the objects and methods of inquiry. In addition to redressing and preventing harms caused by the discipline of archaeology and supporting Indigenous sovereignty and associated ecological stewardship, this approach to collaborative survey offers substantial theoretical and methodological insights for the field of archaeology itself, particularly during the phase of prospection but with implications for collaborative research designs in any context.

Survey in archaeological research design

Survey plays a pivotal role in all archaeological research, from determining archaeological objects of interest to producing knowledge about those entities. Archaeological survey is traditionally subdivided into two categories: prospection and sampling, or purposive and statistical survey. Purposive survey refers to the process of locating sites in a landscape,

thereby ascertaining the variability of site types and their spatiotemporal distribution in a particular area. This type of survey does not seek to produce a representative sample of some statistical population of archaeological entities; rather, prospection "takes advantage of any information available that may improve the chances of discovering the archaeological remains of interest" (Banning 2002: 28). By contrast, statistical surveys seek to generate a sample from which inferences may be drawn about the parameters characterizing some imagined population of entities, including hypothesis testing. In practice, this is generally achieved by traversing evenly spaced transects in some predetermined geometry. Depending on the research aims, both types of survey may be necessary and, in areas where archaeological exploration has been scant, purposive survey is usually a necessary precondition for designing any appropriate statistical sampling protocol (Banning 2002; Schiffer et al. 1978).

Rather than being treated as two necessary phases of research, however, purposive survey is often disparaged as unscientific. This dismissal has resulted in little discussion of this method within archaeological literature, despite its essential role as the first phase of work in almost every archaeological project. For example, Dancey (1974: 100) critiques the use of purposive survey in any research design, equating it with antiquarianism and describing it as "an aimless walk in an unbounded area." Most publications about survey methodology come from the "New Archaeology" era and tend to emphasize designs for statistical hypothesis testing, to the exclusion of purposive approaches, often implying that these latter lack any characterizable method (e.g., Ammerman 1981; Plog et al. 1978; Redman 1973).

The statistical survey methods that most archaeologists employ were developed in areas with high ground and parallel visibility and favorable survey conditions (Ammerman 1981). In tropical forest environments that are densely vegetated, especially if they are understudied to begin with, sampling is often unsuccessful at locating sites (Neves 2018). Site detection using sampling methods also may be difficult in regions without monumental architecture or where sites have been buried by depositional processes. Yet, the prestige accorded statistical survey often has led archaeologists to employ it even in settings where a purposive approach is more appropriate.

Ethnoarchaeology and ethnographic survey

In high-visibility settings, it is inefficient to use a sampling design for prospection; in low-visibility settings, or where the archaeological record is little known, such a methodological choice is indefensible. From a purely practical standpoint, then, prospection is necessary in Darién. Additionally, the combination of a self-propagating publication bias in Panamanian archaeology and the modern conception of Darién as a "pristine wilderness" has created an archaeological Darién "Gap." This artificially constructed void has adversely impacted Indigenous sovereignty, environmental stewardship, and archaeological scholarship in the region. Taking Banning's formulation seriously, what information do archaeologists consult when seeking to improve their chances of encountering archaeological targets?

One purposive survey strategy that archaeologists frequently employ is known as ethnographic survey. It has not been well-characterized or theorized, but it is often mentioned in site volumes as an essential technique. Confusingly, this term is used to refer to two different survey techniques: (1) asking locals about site locations because of their experience in a particular geographic area and (2) looking for archaeological sites in places on the landscape frequented by specific locals, presumed by the archaeologist to practice analogous subsistence strategies to the archaeological population. The first strategy has been commonplace in

archaeology since antiquarian ventures (Schiffer et al. 1978), but it has been criticized for its tendency to exacerbate subsistence digging and looting, because it involves demonstrated interest in archaeological materials by comparatively wealthy strangers without any community engagement or even clarity about their goals (Harrington 1991; Vitelli 1984).

The second of these strategies emerged from the larger framework of ethnoarchaeology, which arose as a form of hypothesis testing to substantiate middle-range theory (Binford 1978; Stiles 1977). In the context of ethnoarchaeology, ethnographic survey involves interviewing or engaging in participant observation with contemporary occupants of a landscape and using their present-day strategies to infer the locations of archaeological sites. As Hole (1979: 201) writes, these methods "can enable one quickly to spot suitable places for camps and, on the assumption that nomadism is ancient and reasons for siting camps have not changed drastically, one should be able to find sites." This type of false equivalency primitivizes living communities by situating them within a fictitious ethnographic present (Fabian 1983), with correspondingly deleterious implications for research based on such ideas. As a result, ethnoarchaeology has been widely critiqued for its implicitly social evolutionary and racialized ideology and ignorance of historical and cultural specificity in favor of generalized trends and models (Gosselain 2016).

Unfortunately, ethnographic survey in both senses has not been subjected to the critiques of ethnoarchaeology, despite succumbing to many of the same ethical and logical lapses. Typically, both types of ethnographic survey involve asking local community members for information about site locations but circumscribing their involvement to cursory "informants" rather than involving them in the process of research design. Therefore, it is often an extractivist practice. In addition to these ethical issues, it is also epistemically flawed. By narrowly delimiting community involvement, archaeologists have failed to appreciate the full extent of community knowledge about sites, including local taxonomic systems, cartographies, and histories of significance, adversely affecting the accuracy of archaeological interpretation and leading to erroneous decision-making in subsequent phases of research.

Thus, the process of defining the "archaeological remains of interest" themselves is crucial. If the archaeological targets of survey are determined by archaeologists alone, then the information that local communities might bring to bear on the research will be less impactful. If, instead, archaeologists and communities co-produce the research, including identifying the objects of inquiry, then local communities (which hold more and/or different knowledge about cultural landscapes than archaeologists) are better able to guide purposive survey toward fruitful ends.

Archaeology with, for, and by descendant communities

Within the past two decades, three subdisciplines in archaeology have emerged that promise to reshape relationships between archaeologists and descendant communities: Indigenous archaeology, archaeological ethnography, and community-based participatory research. As noted in Chapter 3, Indigenous archaeology, first defined by Nicholas and Andrews (1997: 3) as archaeology that is "with, for, and by Indigenous peoples," centers Indigenous voices in archaeological theory and practice. In Canada and the United States, it emerged as a direct result of the American Indian Movement and other Indigenous-led activism protesting the desecration of Indigenous cemeteries and other sacred sites in the name of archaeological research (Echo-Hawk and Echo-Hawk 1994; Hammill and Cruz 1989).

Although the fights against development-related destruction and for the return of ancestors are ongoing, Indigenous communities have increasingly initiated their own

archaeological projects, often pioneering minimally invasive methods (see Atalay 2006; Laluk 2021; Nelson 2020; Silliman 2008; Watkins 2000). Indigenous archaeologists design research collaboratively with community partners, braiding Indigenous knowledge systems and their ethical entailments with traditional archaeological practices (Atalay 2012).

Archaeological ethnography emerged in the context of the decolonial shift (Dussel 2020). Defined as "a shared, trans-cultural space of coexistences and interactions among people and communities of diverse origin and background" (Hamilakis 2016: 3), archaeological ethnography cannot be reduced to a single conceptual framework. Instead, it is an exercise in critical epistemology, initiating a multivocal dialogue about how we learn to know and understand things (Brady and Kearney 2016). Archaeological ethnography focuses on materiality and temporality and emphasizes the inherently political nature of archaeological research (Hamilakis 2011). It stresses the importance of recording contemporary material traces using archaeological methods.

Community-based participatory research is not a framework unique to archaeology, emerging as separate but related practices from popular education, action research, and participatory research (Strand et al. 2003). Although many discipline-specific definitions exist, community-based participatory research can be broadly defined as "the systematic creation of knowledge that is done with and for the community for the purpose of addressing a community-identified need" (Strand et al. 2003: 8). Atalay (2012: 63) identifies five principles common to archaeological projects that employ community-based participatory research: "(1) [t]hey utilize a community-based partnership process; (2) they aspire to be participatory in all aspects; (3) they build community capacity; (4) they engage a spirit of reciprocity; and (5) they recognize the contributions of multiple knowledge systems."

Community-based participatory research and archaeological ethnography are employed in a wide variety of settings, while Indigenous archaeology is typically restricted to contexts where archaeologists collaborate with communities that identify as Indigenous (but see Atalay 2007). While similar, the different origins and contexts of application of these frameworks make them complementary and not equivalent (see Atalay 2012, 2014; Castañeda 2009; Watkins 2020). In our collaborative project with Indigenous Emberá communities in the Darién Province, we draw on all three frameworks, emphasizing community partnership in all phases of the research design and execution; reciprocity in research products; and respectful engagement with Indigenous place-based knowledges, ontologies, and ethics.

Collaborative archaeological survey

Archaeological ethnography is centered around archaeological discourses and decolonizing epistemologies; meanwhile, most methodological scholarship from Indigenous archaeology and community-based participatory research has concentrated on how these commitments have influenced excavation. This focus makes sense given that destructive, invasive excavation without prior and informed consent of living descendant communities prompted the activist movements that led to the development of Indigenous archaeology. Another focus of methodological reform has been bioarchaeological research involving human ancestors themselves, particularly ancient DNA research (Bader et al. 2020; Bardill et al. 2018; Tsosie et al. 2020; Wagner et al. 2020).

However, little attention has been paid thus far to how Indigenous archaeology, archaeological ethnography, and community-based participatory research can reform our methods of archaeological survey, a critical phase of research with implications for maintaining

confidentiality of sacred places and community access, as well as all subsequent phases of research where knowledge co-production is a primary objective. Just recently, new consideration has been given to how an Indigenous archaeology perspective can contribute to geophysical survey methodologies (Wadsworth et al. 2021a, 2021b), including the provision of ethical guidelines for collaborative remote sensing work with Indigenous communities (Davis and Sanger 2021; Sanger and Barnett 2021). This attention has arisen from collaborative work with Indigenous communities that use geophysical methods to locate unmarked graves of Indigenous children who passed away at residential schools in the United States and Canada, as part of an ongoing mission to bring these children home (see Montgomery and Supernant 2022; Supernant 2018).

Nelson (2020) discusses the value of intensive surface survey from an Indigenous archaeology perspective, describing how it elucidated unexpected materials and contributed to a minimally invasive approach. He also frames the redaction of site locations, cultural knowledge, photographs, and raw data within Simpson's (2014) context of ethnographic refusal, arguing that these practices recognize the sovereignty of Indigenous nations and protect intellectual property rights to cultural knowledge (discussed later in this chapter). Throughout this text, I have made an explicit effort to respect the knowledge sharing protocols of the communities I collaborate with. For example, some survey data collected with the community of Mogue is not shared in this chapter but is explicitly for internal community use, no raw data is shared that would enable researchers to circumvent Mogue's protocols for research approval (see Chapter 6), and no site locations or photographs that might reveal site locations are included. The catch-and-release surface collection strategy developed by the Kashaya Pomo Interpretive Trail Project, in which artifacts from surface and near-surface contexts found during survey are collected and analyzed in the laboratory before being returned to their original contexts, was also an important innovation in intensive survey methods that originated from Indigenous, community-based participatory archaeology (Gonzalez 2016; Gonzalez et al. 2006). This methodology was developed by "[g]rounding the selection and use of archaeological methods according to tribal principles," treating archaeology "as a method of tribal historic preservation" (Gonzalez 2016: 539). Thus, innovation arose from not taking standard archaeological methods as givens but recognizing the value of archaeological knowledge production in a particular context and developing new methods in accordance with community protocols, with the explicit intent of exercising sovereignty by stewarding Tribal Cultural Resources.

These authors all describe ethical and epistemic benefits of Indigenous approaches to collaborative sampling/statistical survey, which intensively investigates delimited areas that have already been determined to be the foci of study. In this chapter, however, I focus on the less-discussed, earlier phase of prospection, which determines what these areas of focus should be. Because purposive survey is (or should be) typically the first phase of archaeological research and has an important role in shaping the research trajectory that follows, it is critical that members of descendant and local communities—in this case, Indigenous communities—be involved as true partners in this phase of research design. In our approach, community members and archaeologists determine through dialogue what constitutes a "site" or other material culture worthy of recording, how these locations should be recorded, and how these data should be stored. This partnership with community members also incorporates the idea that archaeological materials are multitemporal, and traces of even very recent practices are scrutinized through archaeological lenses (Hamilakis 2011). The remainder of this chapter reflects on best practices

for a collaborative archaeological survey, based on our ongoing partnership with Indigenous Emberá communities in the Darién Province of Panama.

From archaeological sites to landscapes of place-based knowledge

By replacing standardized regional or global taxonomies of archaeological entities with local understandings of cultural landscapes, we adopted a place-specific method of organizing knowledge of the human past. Inspired by a critical cartography approach (Kim 2015), we partnered with Emberá communities to develop an expansive approach to survey, integrating ecological and archaeological techniques to document the varied material manifestations of human-environment relationships. These included traditional archaeological sites, but even here it is noteworthy that community members used the term *lugar* (place) rather than *sitio* (site) when referencing these locations.

Therefore, rather than describe our spatial data as archaeological sites, we consider them to be important points within a broader landscape of place-based knowledge (see Chapter 3). Although some place-based knowledge might coalesce in features that are recognizable as traditional archaeological sites, it is a more inclusive concept that can be adapted to reflect the knowledge system and transmission mechanism of diverse communities. This concept is advantageous for archaeological practice, as defining an archaeological "site" has always been fraught (Dunnell 1992; Dunnell and Dancey 1983), particularly as archaeologists continue to learn the extent to which many landscapes are anthropogenic (see, e.g., Erickson 2008; Ford and Nigh 2009; Lightfoot and Lopez 2013). By using the framework of place-based knowledge, we can design surveys based on community standards for determining places of importance.

Archaeological survey as participatory mapping

In developing our approach to this work, we drew on the field of participatory mapping for inspiration, intended to contest the colonial perspective of most cartography by empowering Indigenous and other marginalized groups to present alternative conceptions of landscapes that better reflect their worldviews (Chambers 2006; Sletto 2009). This approach blends participatory learning and action practices—which heavily influenced the development of community-based participatory research—with cartographic methods, including the employment of geographic information systems (GIS). As I will discuss in greater detail, I view participatory mapping as a type of countermapping (Peluso 1995) that contests dominant governance structures and advances progressive social changes. In this case, it challenges usurpation of land by the settler colonial nation state in order to further Indigenous-led efforts to exercise sovereignty over land, water, and cultural heritage.

In alignment with Atalay's (2012) criteria for community-based participatory research projects in archaeology, participatory mapping incorporates community research questions and facilitates community input in research design, making the practice truly participatory. Community members are involved in data collection and decision-making concerning data storage, which builds community capacity and recognizes communities, rather than archaeologists, as stewards of both physical landscapes of place-based knowledge and the data they generate. These responsibilities may be shared with archaeologists or other specialists at the behest of communities, but communities are empowered in initiating consultation with researchers rather than, as often happens, researchers following perfunctory consultation procedures that do not reflect a true research partnership. Following Atalay et al. (2014) and Watkins (2015), this idea contradicts the current first Principle of Archaeological Ethics

according to the Society for American Archaeology, which self-appoints archaeologists as the primary stewards of the archaeological record, regardless of the wishes of descendant and local communities. Local communities are evidently the stewards of their own place-based knowledge, while archaeologists are perhaps welcome aids in its study.

Because community members determine the criteria for documentation of place-based knowledge in dialog with archaeologists, a participatory mapping approach recognizes the contribution of multiple knowledge systems, foregrounding community expertise. Finally, archaeologists and communities design the final products of research together, which engages a spirit of reciprocity. These products may be multifaceted and targeted toward different aims, including texts like this one written for a primarily academic audience, presentations at government and community meetings, and maps and other documentation for use in legal cases.

Intellectual property and knowledge appropriation

As a co-holder of some place-based knowledge shared with me by community partners, I am aware that the increasing popularity of Indigenous knowledge within academic and political spheres can be problematic for Indigenous communities. Although Indigenous philosophies are not monolithic, Indigenous sociopolitical systems tend toward communal ownership that does not privilege the individual and therefore do not conform to most Western property law (Herz 1993; Holder and Corntassel 2002). Thus, there is an incommensurability between how Indigenous communities accord value to landscapes and Western commodification. After much intellectual theft, Indigenous groups have had some success claiming proprietary interests in plant genomes due to their economic potential (Bodeker 2003; Cleveland and Murray 1997; McGonigle 2016; Posey 2002). However, much place-based knowledge provides less clear economic reward, and settler intellectual property law typically only adjudicates cases that involve economic consequences for plaintiffs. Therefore, many groups have been unable to contest the appropriation of place-based knowledge through intellectual property rights because there is no obvious profit motive (see Arewa 2006; Battiste and Youngblood Henderson 2000; Brown 1998; Duerden and Kuhn 1998; Oguamanam 2008; Stabinsky and Brush 1996).

As such, many Indigenous communities have raised concerns about the potential for appropriation and commercialization of place-based knowledge. As Battiste and Youngblood Henderson (2000: 12) write:

> As Indigenous knowledge and heritage become more intensely attractive commercially, the cognitive heritage that gives Indigenous peoples their identity is under assault from those who would gather it up, strip away its honored meanings, convert it to a product, and sell it. Each time that happens, the heritage and knowledge die a little, and with them, the people.

These authors also state that many teachings are indeed intended to be shared outside of internal contexts and that the goal should be mutual respect and dialogue between Western and Indigenous knowledges rather than segregation. They argue, however, that until the power dynamic between these two trajectories of knowledge is more balanced, Indigenous groups must protect their heritage and knowledge from being defined in Eurocentric terms and exploited. It is therefore essential that community members are involved in designing infrastructure for data storage and control data dissemination. Although our workflow is always a work in progress, I feel that it is important to foreground these concerns with appropriation and consider them in developing our methodology.

Survey in Darién Profundo

The remainder of this chapter describes our approach to participatory mapping as archaeological survey based on our ongoing project in the Darién Province of Panama. Although my focus here will be collaborations with Indigenous Emberá communities, we also collaborate with Afro-descendant communities in Darién, which has also shaped our research methodology.

The name of our archaeological project, Darién Profundo, comes from a statement by Noé Alvarado, a *Darienita* of African descent from the community of Chepigana, now living in Guayabillo (see Chapter 3). He hosts a popular morning radio program called *Despertando al Darién* (Waking up Darién) and is an authority on the history, politics, and contemporary society of the province. Like many of our collaborators, he feels this absence of national and international appreciation acutely and hopes that our collective project will counter prevailing Western narratives about the province, which focus on its status as a border with Colombia and emphasize its dangers, from narcoterrorism to environmental hazards that migrants face while traveling through the so-called Darién Gap (Noé Alvarado 2019, personal communication).

The national narrative of Panama also has contributed to this Othering and primitivization of Darién and the communities who call it home; Panamanian scholars and governmental employees working in the province often describe the imagined versus real distance between Darién and Panama City (Almanaque Azul 2019). Although it takes only three hours to drive on a paved road from the nation's capital to the Darién border, Darién is commonly referred to as though it were another country altogether, and people from Darién almost always refer to themselves as Darienitas rather than Panamanians.

Along with the concentration of national archaeological expertise in Panama City and the logistical complication of accessing certain parts of the Province, this Othering has contributed to a dearth of archaeological scholarship in Darién. The little archaeological work that has been done exists in the form of unpublished, one-off studies written up only as *informes* (reports) on file with the Panamanian government or, more recently, environmental impact studies carried out in advance of development projects. This lack of collated and published archaeological work has resulted in the fictitious construction of an archaeological "Darién Gap," perpetuated by maps published until at least 2015 that portrayed the existence of only one archaeological site within the entirety of Darién Province (Velásquez Runk 2015).

Our project was established in an initial attempt to rectify this bias, which has resulted in the construction of imagined geographical narratives of Darién as a virgin forest devoid of human history, erasing Indigenous communities from the landscape. This erasure has been instrumental to neoliberal conceptions of development. Based on the interests of our community partners, the initial goal of our project is to construct the first chronology of human-environment relations in Darién Province, with particular attention to landscape stewardship and with important implications for ongoing legal claims.

The "Darién Gap" I describe is not unique to archaeological mapping; many communities in the province remain entirely undocumented on official government maps (Moutinho 2021). Most recently, this has posed a problem for responses to COVID-19. While communities effectively self-enforced quarantines, unmapped communities did not receive essential supplies like food and medicine from governmental distributions and had to break quarantine to obtain them, putting themselves and their communities at elevated risk (Baudilio Calderón, Eduardo Garabato, and Ismael Flaco 2020, personal communications). Especially since hospitals are scarce within the province, often requiring a journey of several hours by boat, and because Indigenous communities have been disproportionately impacted by COVID-19 throughout the

Americas (Power et al. 2020), this lack of data about community locations could have had deadly effects.

Luckily, there is a substantial tradition of Indigenous-led participatory mapping efforts in Darién. Local community members trained in drone and GPS mapping, the Coordinadora Nacional de Pueblos Indígenas de Panamá, and the Rainforest Foundation US joined forces to create a real-time COVID-19 map that documents hotspots and facilitates government response (Rainforest Foundation 2021). These mapping efforts, which have become essential in mitigating this crisis, were started by Indigenous communities seeking legal titles to their ancestral lands (Bilbao 2019; Guillemette et al. 2017; Herlihy 2003).

Ecological conservation efforts also have contributed to Indigenous sovereignty movements. For example, a team from McGill University trying to mitigate deforestation partnered with the community of Manené in a participatory mapping initiative that culminated in the Macua Balsa, a map of Emberá communities along the Balsas River labeled with Emberá toponyms and family histories, which will hopefully aid Indigenous land claims in the near future (Catherine Potvin 2020, personal communication). Participatory mapping has been incorporated in recent land claim efforts because previous titles granted to Indigenous communities in Darién have included only a limited amount of the land used by these communities in their daily lives (Velásquez Runk 2012).

To obtain any form of title, whether that be status as a semiautonomous *comarca*, internally governed by Indigenous political systems, or the less autonomous *tierras colectivas* (collective lands), Indigenous communities must carry out extensive mapping campaigns in order to submit detailed territory maps to the Autoridad Nacional de Administración de Tierras. Communities must demonstrate that they are, in fact, Indigenous, which is defined by the Panamanian national government as groups of people descended from the inhabitants of Panama at the time of colonization who have conserved their unique social, economic, cultural, linguistic, and political institutions (Law 72, Article 2 of 2008). They also must have maintained practices of "traditional occupation," defined as the possession, use, conservation, and management of their ancestral lands. Archaeology provides one suite of methods that can be used by Indigenous communities in Panama to incorporate time depth into their applications to avoid the delimitation of their territories according to Western perceptions of places and borders, while also drawing connections (if warranted) between older sites of place-based knowledge and contemporary material culture.

Although Law 72, Article 16 of 2008 promised to fund the necessary delimitation of territories as part of the titling process, and Article 5 stated that the Dirección Nacional de Reforma Agraria would promptly attend to and prioritize the titling process, this law was never enforced, and Indigenous groups have grown impatient with the national government after waiting decades for titles, to no avail (Halvorson 2018). Some government mapping efforts have artificially constrained ancestral lands, resulting in the titling of lands that encompass in some cases only 11% of the tribe's actual lands (Arghiris 2018). In addition to the temporal dimension that our work can elicit, we can provide necessary resources and labor toward ongoing but underfunded Indigenous-led cartography efforts in Darién.

Panama is currently home to seven Indigenous groups: the Ngöbe, Buglé, Guna, Emberá, Wounaan, Bribri, and Naso Tjër Di. Some 12% of Panamanians (~0.5 million people) identify as Indigenous, but this percentage is much higher in Darién, which is home to only 48,000 people (1% of Panama's population) but covers 22% of the country's total land area (Instituto Nacional de Estadística y Censo 2010). According to participatory mapping work conducted in 1993,

some 14,749 Indigenous-identifying people lived in Darién Province or in semi-autonomous comarcas within it (73% Emberá, 16% Wounaan, 10% Guna, 1% other; Herlihy 2003). This number cannot be directly compared with the 2010 census, as the population of Darién Province has increased in the intervening two decades, but these statistics indicate that the proportion of Indigenous people within Darién at least twice as high as the national average: in other words, Indigenous people represent at least one-quarter of Darién's population today, likely more. Darién also includes the majority of Panama's extant tropical rainforest—in the most heavily forested country in Latin America—and is home to Darién National Park, the largest protected area in Panama and one of the largest remaining tropical forests in Central America (UNESCO 2021).

A significant portion of this state-controlled rainforest overlaps with Indigenous ancestral lands; the government has used this overlap to deny the sovereignty of Indigenous groups over these areas (Halvorson 2018). Studies have shown, however, that Indigenous governance has been more successful than state management at preventing deforestation in Panama (Nelson et al. 2001) and in other countries in Central America (Hayes and Murtinho 2008; Nepstad et al. 2006; see also more extensive discussion of this issue in Chapter 3). Preventing deforestation is urgent: between 2001 and 2019, Panama lost 414,000 hectares (7.3%) of its tree cover, 104,000 hectares of which is located within Darién Province. By contributing to Indigenous land claim cases, archaeologists can work toward rectifying the human rights issues of Indigenous dispossession and cultural genocide while also supporting carbon sequestration and ensuring future habitats for Darién's many endemic species (UNESCO 2021).

Our study area is centered around the Gulf of San Miguel watershed, dominated by the Tuira River and feeding into the Pacific Ocean. By provisionally defining our unit of study according to an ecosystem rather than a predefined culture area, we engaged in dialogues with multiple communities. This chapter focuses primarily on our most developed partnerships with Emberá communities, in both entirely Indigenous settlements and in multiethnic towns, which arose due to desires for archaeological work that would contribute to Emberá stewardship of cultural landscapes. Other Emberá communities previously solicited archaeological consultation concerning the documentation and interpretation of cultural heritage (Mendizábal and Theodossopoulos 2012), and although this partnership lasted only one season, it provided a strong foundation for our work.

In Panama, all archaeological permits are issued at a national level, by the Dirección Nacional de Patrimonio Cultural. Unlike some other countries (e.g., Mexico), these permits do not give one research project sole authority over a given project area for a given time. Rather, they provide authority to carry out a proposed research agenda for one season of fieldwork. A report must be submitted following the season before another permit can be requested. Unfortunately, the national government does not require the submission of permission from Indigenous or other local authorities, as all cultural heritage is governed at the national level under Panamanian law. Although subsequent permits have been written in dialogue with the community of Mogue, our initial permitting request predefined a study area, following Panamanian regulations concerning cultural heritage, prior to engaging in discussion with the community, one of many political implications of this legal structure of heritage that has limited our recognition of Indigenous sovereignty (see Chapter 6 for further discussion). However, we did sign a formal resolution with the community of Mogue that recognized their sovereignty over research conducted within their lands, even if the Panamanian national government does not

consider it binding, thereby taking a step towards a full engagement with Indigenous place-based knowledge, in which communities would define a study's area from its inception.

Cartographies of place-based knowledge in Darién

After an initial visit to meet with community members in January of 2019, we carried out our first season of archaeological fieldwork in June and July of 2019. Rather than organize our survey according to a predetermined rectangular grid, we planned a series of surveys alongside the communities of Yaviza, Sansón Arriba, El Real de Santa María, Chepigana, La Palma, Mogue, and Garachiné (Figure 4). Initially, all sites were recorded in ArcGIS Collector, which allowed us to iteratively construct maps in the field and permitted geolocated attachments in multiple media formats (images, audio files, text). The proprietary nature of this application, however, makes it difficult for community members to access, modify, and use the data once it is recorded. I have since redesigned this process using an open-source system that allows remote recording by anyone with an Internet connection, which I will discuss later in the chapter.

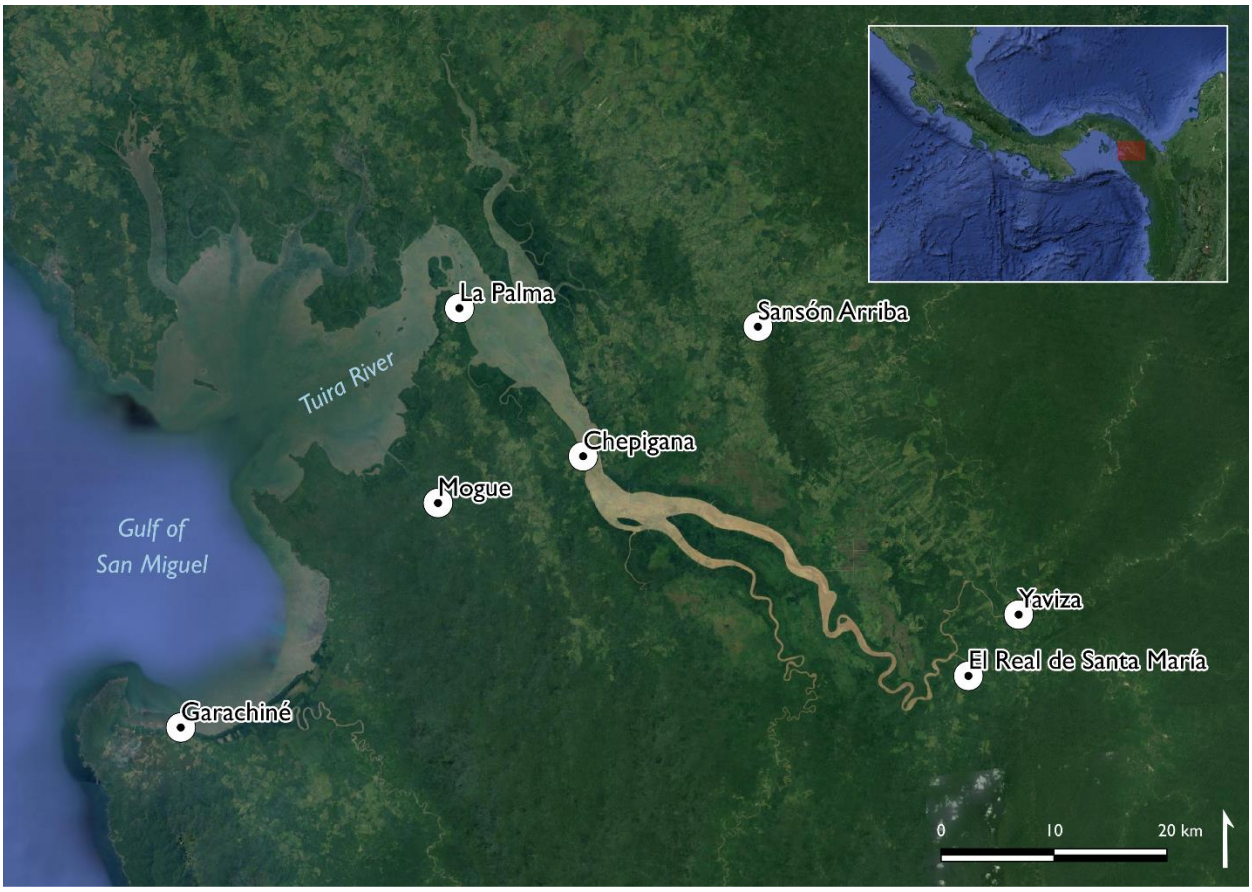

Figure 4. Map of study area and the communities collaborating with Darién Profundo in 2019.

Prior to beginning the survey and on an ongoing basis thereafter, we discussed with community members which places have important historical value and how we should prioritize site visits. This commitment meant that our survey criteria differed from place to place based on changing community norms. We documented many traditional archaeological sites (shellmounds, petroglyphs, ceramic scatters) but also many nontraditional sites (recent historical

cemeteries, recent historical structures, contemporary material culture, ethnobotanically significant plants; see Donner, Gill, and Mendizábal 2019 for complete descriptions).

Relying on community-driven criteria to identify locales containing historical place-based knowledge facilitated storytelling and knowledge production throughout the survey process. As a result, our itineraries were more reflective of human cultural landscapes. For example, community members typically chose to follow well-traveled paths or boat routes, some of which were maintained by the community due to the ongoing importance of the places they traversed (Figure 5). Without necessarily drawing any direct historical analogy between our community partners and the landscape's previous inhabitants, adhering to modes of transit more representative of the human experience allows archaeologists to internalize a more accurate representation of how a place may be understood by human occupants. This explicit incorporation of the embodied experience echoes Sundberg's (2014) praxis of decolonization through the bodily gesture of walking (see also Horton and Freire 1990), which emphasizes its continually unfolding nature as well as its lack of a teleological endpoint. Although we can literally "take steps" to decolonize our practice, "decolonization is something to be aspired to and enacted rather than a state of being that may be claimed" (Sundberg 2014: 39). However, by "walking with" Indigenous communities and individuals as "colleagues in the practices of producing worlds" (Sundberg 2014: 41), we can both understand each other's modes of constructing knowledge and co-create "worlds and knowledges otherwise" (Escobar 2008: 12).

Figure 5. Surveying on Río Mogue by *piragua* (dugout canoe).

These routes were more thematically oriented than traditional archaeological surveys, whether purposive or statistical, and all team members thereby engaged in a collective and collaborative process of iterative interpretation of historical evidence. By grounding this co-created interpretive process in a shared conception of place-based knowledge, we were able to combine inferential strategies from both local and nonlocal (e.g., archaeological) knowledge traditions.

For example, our community partners in Mogue led us to one place, Quebrada Seca, named for its location alongside a seasonally dry ravine. It covers an area of at least 50 by 8 meters, although only one part of the site was closely surveyed. The material culture present on the surface consisted of chipped stone debitage comprising the entire process of lithic reduction (raw chert nodules, wasted cores, scrapers, and micro-flakes), as well as one complete chert arrowhead (Figure 6). Collaborative interpretation identified the site as a likely lithic workshop, where tools were produced in situ. According to one community member, whose family uses a portion of the site to cultivate maize, he and his family have found historical metal tools for maize milling in the area (Antonio 2019, personal communication). Therefore, he hypothesized that the site was recent in origin, despite the occurrence of stone tool production, and thought community members may have manufactured this technology as recently as one or two centuries ago. This suggestion runs counter to standard archaeological interpretation in the region, as archaeologists typically treat arrowheads as indices of pre-Hispanic occupation and associated large game hunting. However, this artifact was manufactured using low quality chert, which lacks the physical properties required to function properly as a weapon, and the technical aspects of its production differ in other ways from known pre-Hispanic arrowheads (Tomás Mendizábal 2019, personal communication). Although lithic production is no longer practiced in the community of Mogue, this community interpretation of potentially recent chipped stone manufacture illuminates an instance of circular reasoning in archaeology, whereby inferences about chronology can artificially bias archaeological interpretation against the persistence of Indigenous technologies.

Figure 6. Chert arrowhead in context at Quebrada Seca.

The site also contained large fragments of ceramic vessels, likely remnants of receptacles used for collecting and storing water from rains and the nearby creek. Because the creek only runs with water in October, hence the name of the place, it would have been necessary to store water while working at the site during other times of year, which residents of Mogue continue to do today (Alberto Moña 2022, personal communication). Our discussions about the potentially recent production of these vessels led us to work with another community member, whose mother until recently produced ceramic pottery using traditional methods (Bélgica 2019, personal communication). Although she did not produce this pottery herself, she continues to use her mother's pots as water containers, cooking implements, and ornaments, and we discussed the differences and similarities between the ceramic technologies her mother used versus those used to produce the sherds from Quebrada Seca (Figure 7). She and other community members also continue to use traditional *metates* alongside the metal mills mentioned earlier for grinding starches and grains; thus, although chipped stone implements are no longer important features of life in Mogue, groundstone is still an important industry. From this one day of survey, we were able to formulate hypotheses concerning not only where and how ceramics were used historically, but also how these practices have both persisted and changed in the contemporary community.

Figure 7. Ceramics documented at Quebrada Seca (left) and in the home of Doña Bélgica (right).

Counter-mapping and place-based internationalisms

The stories that emerge from the participatory mapping of place-based knowledge are a better representation of Indigenous conceptions of place and territorial boundaries than the products of traditional Western archaeological surveys. They can contest both archaeological culture areas and the borders imposed by contemporary nation states. For example, in my first visit to Mogue in 2019, Antonio, a teenager from the community, led me and my co-director Natalia Donner along a well-maintained dirt path. About thirty minutes' walk from the village, he introduced us to a place known as La Mola, an igneous boulder measuring 3 meters in length by 2 meters in width and 3 meters in height, inscribed with a monumental collection of human, animal, plant, and geometric artworks (Figure 8). No other archaeological materials were visible in the immediate vicinity of the site, but lithic flakes were encountered in the aforementioned path. The name of the place, given by the contemporary inhabitants of Mogue, refers to an elaborate textile art form created using reverse appliqué, which is unique to the Guna and is not

practiced by the Emberá. The use of fabric may be a postcolonial transition from painting these motifs directly on the skin (Marks 2016). So far as we know, this nomenclature has never been used by the Guna to refer to artistic renderings in stone. This act of naming, however, indicates an association that the people of Mogue have drawn between this site of place-based knowledge and the Guna. They not only see a resemblance between the combined high and low relief sculpting technique used to incise the petroglyphs and the visual appearance of *mola* textiles, but explicitly state that it was created by Guna ancestors, in contrast to other examples of Emberá art within the territory of Mogue (Arnulfo Caisamo and Alcibíades Calderón 2022, personal communications). Nevertheless, it remains an important place for the Emberá people of Mogue, who maintain a path to it and have painted and etched it recently to accentuate the visibility of carvings.

Figure 8. La Mola.

On a return visit in 2022, Tom and Aristides Teucama showed me the unusual concentration of *piro* (*Bromelia karatas*) and *jobo* (*Spondias mombin*) fruit trees at this site, and we picked some jobo to enjoy, which they described as a favorite food of humans and the shy brocket deer (*Mazama temama*) that also inhabit this forest.[26] They and other collaborators also

[26] Both of these fruit species are understudied but are believed to be less prevalent than in the past, due to rapid population growth, effects of climate change such as more extreme droughts and floods, invasive species, overgrazing, burning, deforestation, and changing planting patterns caused by urbanization (Wong Vega 2021). The piro is known to also be a particularly important food for the Guna nation (Farnum Castro 2012; Wong Vega 2021). See Chapter 5 for a further discussion of brocket deer in a Nicaraguan context.

noted that today, the path by La Mola continues on all the way to the community of Sambu, connecting Embera communities with those of the neighboring Wounaan Tribe (Alberto Rito, Tom Teucama, and Aristides Teucama 2022, personal communications). With Guna carvings and Emberá stewards, on the only terrestrial path that connects Emberá and Wounaan communities, this place embodies inter-Indigenous relationships and is a point of connection across the social landscape of Darien.

I am reminded of Betasamosake Simpson's (2016, 2017) concept of place-based internationalism, which refers to Indigenous traditions of building and maintaining international relationships and solidarities, while remaining grounded in place. This association challenges property ownership norms set by the modern nation state, which rely on unchanging, nonoverlapping borders. In addition to overlaps with state-protected areas hindering Indigenous groups from obtaining titles to their ancestral lands, overlaps in territories between groups also has posed a problem, because the government will not title the same land to multiple groups, despite the existence of inter-Indigenous treaties permitting shared fishing, hunting, and so on, on the same lands (Herlihy 2003). While place-based internationalisms are a feature of many frameworks of Indigenous Law, they are illegible to settler-colonial legal frameworks, and their mischaracterization has resulted in Indigenous disenfranchisement. As archaeologists, we must be concerned with doing justice to, and not oversimplifying, these complex histories of place.

This schema of nonoverlapping, exclusive territories is inherently linked to the traditional archaeological concept of culture areas, a geographic unit characterized by a homogenous complex of material culture, assumed to result from a homogenous complex of activities (Kroeber 1931, 1939; Wissler 1923). The conception of culture that early anthropologists relied on was developed to justify nation-state territoriality, which required the determination of fixed boundaries (Joyce 2021). Although this definition of culture has been routinely critiqued and is no longer the foundation of anthropological theory, archaeologists continue to draw these artificial boundaries, which echo ethnonationalist ideologies and often do not accord with oral histories and other Indigenous place-based knowledges. Such oversimplified archaeological interpretations have been exploited by nation-states to disenfranchise Indigenous groups from their ancestral lands (Martindale 2014).

In 1976, Richard Cooke published a map dividing Panama into three cultural areas: Gran Chiriquí, Gran Coclé, and Gran Darién. These divisions were intended as heuristics; nevertheless, they have become entrenched as this map continues to be reprinted, and archaeologists tend to situate their work with respect to one of these postulated "groups." Static culture areas that incorporate no temporal dimension cannot account for the palimpsestic landscape implied by the coexistence of La Mola and other sites that are claimed as ancestral by the community of Mogue, and such pluralistic histories—place-based internationalisms—are commonplace. Without conducting participatory mapping in partnership with contemporary heirs to the place-based knowledge resident in this site, however, I would likely have associated La Mola with the direct ancestors of Mogue's inhabitants or the abstract Gran Darién culture area. Neither of these designations would be accurate, and they would ignore the repository of knowledge about this site that already exists.

Restoring absences in the landscape

Our participatory mapping approach also drew out strongly felt absences in the landscape. In 2019, Garcilazo Caisamo, a respected community member and elder of Mogue, described to my co-director Natalia Donner and I how a stone monument was missing from its

proper place in the collective lands. Years ago, it was in the process of being looted from the community when the looters were intercepted by the Servicio Nacional de Fronteras (SENAFRONT), the national border police force of Panama, after SENAFRONT was alerted to the theft by Mogue's leadership. Rather than returning the monument to Mogue, however, SENAFRONT officials displayed the monument outside of their headquarters in Darién. It was eventually transferred to the jurisdiction of the Dirección Nacional de Patrimonio Histórico (DNPH) of the Ministry of Culture, who brought the stela to the storage facilities of the Museo Antropológico Reina Torres de Araúz, the national anthropological museum, where it remains to this day. The community of Mogue was never informed what happened to the monument, so although they knew that SENAFRONT had intercepted the looter, they thought it may have been subsequently lost or stolen (Garcilazo Caisamo 2019, personal communication). Consequently, the community is distrustful of archaeologists who come from Panama City and are reluctant to share the location of other sites, fearing further dispossession of these monuments. In 2019, the Mogue community expressed their interest in learning the location of this monument, as well as conducting collaborative research to study the place where the statue originally sat, which still contained another statue in situ.

In 2022, when we were finally able to visit the community once again, the Mogue leadership organized a series of meetings, where we discussed the terms of this collaborative research. After agreeing on the design of research and authorship of research products, the leadership decided to guide us to the location of the monument's pair, four hours on foot from the village of Mogue, within the community's ancestral lands (Figure 9). Both statues were originally in the cutbank of a creek known as Quebrada Honda, at a confluence with a tributary stream. While the smaller statue was looted, the larger statue was lifted by looters but left in the creek because it was too heavy to move. The statues, both anthropomorphic, had lain facing each other, one body atop the other. The statue still in the *quebrada* tapers at its base, suggesting that it was originally constructed to stand upright and that the creek context is a secondary deposition. Community members who introduced us to it identify the statue as Emberá art, in contrast to the Guna art exemplified by La Mola (Alberto Rito and Aristides Teucama 2022, personal communications). Aristides Teucama, who had seen both statues prior to the looting, described them both as Emberá women, based on their physical gestures (2022, personal communication).

Figure 9. Aristides admiring the statue that remains in Quebrada Honda.

In January of 2023, the Congreso Local de Mogue, the official collective governing body of the community, presented a formal resolution to the Ministry of Culture and the DNPH (Congreso Local de Mogue 2023). The community cites Law 72 of 2008, discussed earlier in this chapter and at more length in Chapter 3, specifically the clause that requires governmental entities to coordinate with traditional authorities on projects and plans involving their territory. They also cite Article 11 of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), which states that Indigenous communities have the right to "maintain, develop, and protect past, present and future manifestations of their cultures, such as archaeological and historical sites" (United Nations 2007). They agree to a temporary loan of the statue to the National Museum of Anthropology, pending official recognition by the Ministry of Culture and the DNPH that the statue originated in the Emberá community of Mogue. Darién Profundo both provided archaeological information about Quebrada Honda that the community used in its request and facilitated dialogue between the community of Mogue and the Panamanian Ministry of Culture.

After a meeting at the beginning of March of 2023, the Ministry of Culture formally issued this unprecedented recognition on March 21, 2023, which directly referenced the archaeological report provided by Darién Profundo (González Villarué 2023). Although the Ministry of Culture recognizes the provenience of the statue and its historical and cultural value to the particular community of Mogue, they also take the opportunity to reassert Article 19 of Law 14 of 1982, which established that all archaeological objects are "un bien de dominio

estatal."[27] In recognition of this statute, they declare that the DNPH rather than the community will propose the time frame of the monument's exhibition. However, interpretive materials displayed in the museum will be co-created by curators and the community, acknowledging Emberá stewardship of not just the tangible heritage, but also the place-based knowledge that it holds. The Ministry of Culture also agreed to support a community-based eco-tourism project that would link Quebrada Honda with La Mola and other sites of place-based knowledge that the community wishes to share with outsiders. This project would both provide protection for the remaining statue from looting, allowing it to be stewarded by the community in place, and would address longstanding concerns that the community has about ANCON's involvement in regional tourism.

As discussed in Chapter 3, ANCON has systematically denied Mogue's sovereignty over its collective lands but continues to promote tourism to Mogue's lands, with proceeds going to the non-governmental organization rather than the community. Community members feel that these tours, in combination with ANCON's Internet presence, have not only affected the community economically, but also have resulted in a loss of control over the narrative about Mogue and its ancestral lands (Luzmila 2022, personal communication). This project would also involve an online presence that could counteract some of the misrepresentations of the community, as well as the feeling that ANCON has co-opted Mogue for its own purposes and a lack of capacity (because ANCON has blocked the proposed construction of a cell tower in the community) to respond to this messaging.

With the cooperation of the Ministry of Culture, Darién Profundo has implemented a potential solution to preventing this problem in the future through the storage of archaeological materials in local *casas de cultura* (community centers) rather than in national repositories. This strategy addresses an ongoing storage shortage in Panama City and, more importantly, it affords communities ongoing access to and control over their cultural heritage. We hope that the Ministry of Culture and the DNPH will continue to work with us to develop productive relationships with local Indigenous communities.

In 2022, Darién Profundo assisted the Museum Volkenkunde in Leiden and the Panamanian Embassy in the Kingdom of the Netherlands with an international repatriation of 343 Panamanian ceramic artifacts, an important first step towards supporting community sovereignty over cultural heritage. Archaeologists working in international contexts are in a unique position to facilitate repatriations between their home countries and the countries in which they work. Current recognition of the previous legal vacuum regarding international heritage laws together with historical power asymmetries among nation-states, has facilitated these unprecedented and massive repatriations. These international restitutions should also lead to a critical assessment of heritage management within nation-states, which tends to be centralized rather than community-based and systematically disenfranchises certain groups, particularly Indigenous communities.

Integrative eco-archaeological survey

Our approach to mapping itineraries of place-based knowledge also led us to document places that typically would not be viewed by archaeologists as relevant. For example, we mapped the location where a ceiba tree *(Ceiba pentranda)* was felled and carved into a *piragua*, a traditional type of dugout canoe constructed from a single hollowed-out tree trunk (Figure 10).

[27] "A property under state domain."

Community members chose to show us medicinal plants and describe their uses, which we geolocated. By taking this Indigenous archaeology approach, grounded in community conceptions of what constitutes place-based knowledge with historical significance, we were able to gain a deeper understanding of human–environment relations and their manifestations in material culture (see Sigona et al. 2021 for employment of a similarly integrative eco-archaeological approach). Including these resources in maps presented in land claim cases is critical, because ancestral territories encompass far more than sites of active occupation yet contain resources that are critical to the community's ability to carry out cultural practices.

Figure 10. Lucy, Antonio, and Segundo documenting the in-progress traditional carving of a *piragua*.

Community members also took us to places where important ecological and cultural resources have been decimated by extractivist practices. For example, we took a boat to one locale along the Tuira River called El Real la Vieja, the site of an Indigenous village destroyed to build a Spanish military fort, which was constructed to protect gold coming from the Cana mine farther south. More recently, the site served as a port used to transport trees, mostly *cativo* (*Prioria copaifera*), logged from the riverbanks (Eduardo Garabato 2019, personal communication). This integrative ecological and cultural approach that community members took to survey also led us to document an invasive freshwater mollusk species (*Corbicula fluminea*) in the Tuira River, previously unrecorded in Panama outside of the Canal Zone. Unmanaged, it could outcompete native freshwater mollusks and contribute to the eutrophication

of freshwater ecosystems (Lauritsen and Mozley 1989; Sousa et al. 2008). Therefore, the participatory mapping of place-based knowledge has the potential to inform approaches to ecological conservation and contribute to landscape stewardship and monitoring.

Indigenous sovereignty

Participatory mapping has a history of supporting Indigenous-led sovereignty movements (see Chapin et al. 2005 for a global review of this relationship). As previously mentioned, participatory mapping has been used for decades by Indigenous groups in Darién seeking titles to their ancestral lands, with some success. Unfortunately, the national government has not met its legal obligation to fund these efforts, preventing some communities from even submitting title applications, and as of 2018, 24 tierras colectivas remained untitled despite completing the application process (Halvorson 2018). The community of Mogue, for example, applied for official title to its ancestral lands but was denied sovereignty over its territory because it "failed to follow administrative procedure," after its application was stalled for years (ANATI 2018).

Fortunately, the national government has recently loosened some of its restrictions on title applications. For example, Resolution No. DM-0612-2019 allows communities to apply for titles to lands that overlap with nationally protected areas, meaning that Mogue and other communities are newly eligible. Only one group, the Naso, has successfully received a title because of this new regulation thus far, because their case was already pending before the COVID-19 pandemic (Kennedy 2021). As the effects of COVID-19 subside nationally, more groups will likely seek to exercise their right to title, necessitating increased participatory mapping work. Collaborative archaeology is particularly helpful because, in order to receive titles, communities not only have to map their contemporary territories but also have to submit evidence concerning the historicity of their relationship to their ancestral lands. Therefore, archaeological techniques such as radiocarbon dating and the construction of material culture chronologies can be essential if put into dialogue with oral histories and genealogies.

Remote participatory mapping

We were supposed to return to Darién in March of 2020 to continue this participatory mapping work. However, our plans were derailed. Neither of us traveled to Darién between 2019 and 2022, even as we were vaccinated and borders reopened, due to the lack of access to health care in the province and our concern for the safety of community partners. Despite our physical absence, I maintained open lines of communication through WhatsApp and other social media with our collaborators, who sent me numerous photographs of material culture and GPS coordinates taken with their phones. I realized that I had an opportunity to create a mapping infrastructure that would be even more participatory, whereby community members could upload location information and accompanying media to a free, open-source platform.

I therefore transferred the mapping infrastructure from ArcGIS Collector to KoboToolbox, an application created by the Harvard Humanitarian Initiative for use in data collection during humanitarian crises. Designed to work in remote areas, data can be collected both online and offline (and uploaded later) using any phone, tablet, or browser. Like ArcGIS Collector, it enables the attachment of multimedia data, which is synchronized and encrypted via SSL. In collaboration with Kristin Carlson (Illinois State University) and graduate students in the Program in Creative Technologies, we designed a website (available so far in English and Spanish) through which data can be submitted, as well as a textable QR code that links directly to the submission form (Carlson et al. 2021). The data is uploaded immediately and does not

require administrator approval; however, data are disaggregated by community, and geographic coordinates and all accompanying site information are accessible only with community permissions. I am interested in formalizing this sovereignty-based approach to data management through the use of technologies such as the Traditional Knowledge labels pioneered by Mukurtu and Local Context (Christen 2015). I am currently participating in a National Endowment for the Humanities Institute called "Networking Archaeological Data and Communities" to facilitate this work, in accordance with the CARE Principles for Indigenous Data Governance: Collective benefit, Authority to control, Responsibility, and Ethics (2023). In the meantime, those interested in continuing the mapping process have a user-friendly way to do so that does not rely on our presence in Darién.

Conclusions

I view data sovereignty as an important step toward the ideal of collaborative research, in which local communities drive research from design to dissemination. When the targets of prospection, as well as the kinds of information used to guide their discovery and study, are determined by local communities, purposive survey rests on a firmer epistemic footing. Rather than imposing a regional or global taxonomy of archaeological site types, a participatory mapping approach to collaborative archaeological survey derives the principles for studying local archaeological landscapes from modern Indigenous place-based knowledge of natural and cultural landscapes, without drawing an essentialist analogy between contemporary and past Indigenous communities or imposing a nature-culture dichotomy on an ontological system that rejects this binary (see, e.g., Todd 2015). Constructing archaeological research on this basis simultaneously grounds our work in the ongoing, long-term history of the archaeological landscape that is the object of our study, while also conferring the best chances for safeguarding the future of that history.

This focus on landscapes of Indigenous knowledge also mitigates the biases inherent in archaeological sampling designs, which often explicitly aim to estimate an inventory of "cultural resources" in a region, to weigh their preservation against the expansion of extractivist landscapes, oriented toward patterns of consumption defined by Western capitalism. Such inventories are typically conducted with reference to a supposedly objective standard of archaeological research value, with little concern for the aspects of archaeological landscapes that local communities value. Ironically, due to historically dense tree cover, traditional transect-based statistical survey in the Global South is usually only possible in places already heavily impacted by "development."

In our participatory mapping approach, it is fundamental to not only change how we map, but what we map. I propose moving from mapping the archaeological site to mapping landscapes of place-based knowledge. Mapping archaeological sites as typically conceived limits co-creative approaches, and thus the epistemic goods (see Currie 2018) of dynamic pluralisms as identified by Wylie (2015). Recording sites of place-based knowledge as a practice of counter-mapping initiates a dialogue between different knowledge systems, while taking power asymmetries into account. Mapping landscapes of place-based knowledge allows us to co-create narratives of the embodied experience of living in a place through historical time.

Critical cartographies of Darién involve problematizing imagined geographies, which have created a fictitious pristine, wild, and empty Darién (Velásquez Runk 2015). This erasure of people from the region has erected obstacles for Indigenous communities seeking rights to their ancestral lands, now viewed as a valuable commodified resource. Mapping Darién is therefore an

exercise with implications well beyond traditional archaeological survey. As demonstrated throughout this text, the legal particularities of Indigenous land tenure in Panama have created an opportunity for archaeologists and Indigenous communities to work together toward longstanding common goals, as well as new collective goals. This partnership between archaeologists and Indigenous communities in Darién has resulted in cartographies of place-based knowledge that challenge the traditional culture-historical model, with its static borders, essentialist cultural characterization, and limited definition of archaeological "sites." The results of our work with the community of Mogue, for example, inform us of Emberá internationalism, a paradigm through which people are grounded in place but at the same time conceive landscapes as international. This simultaneously place-based and international existence contests many Western ideological constraints, especially those related to property, borders, identity, and place.

Expanding the itineraries of archaeological surveys to sites of place-based knowledge also broadened the epistemic potential of this approach. Cartographies of place-based knowledge are inherently multidisciplinary; Indigenous agency in the survey process in Eastern Panama resulted in the integration of archaeological and ecological survey. Consequently, we recorded data that is relevant to other disciplines and is normally overlooked in archaeological research. This approach has also encouraged interdisciplinary collaboration within the academy, in this case facilitating an ongoing collaboration with an ecological team from the Universidad Tecnológica de Panamá. Through this collaboration, we have been able to incorporate contemporary ecological survey data into our archaeological interpretations, and they have been able to incorporate a historical dimension to their studies. The potential of place-based knowledge, accordingly, goes beyond challenging national borders; it also blurs disciplinary boundaries and has relevance for ecological and cultural conservation and landscape stewardship. As a response to the global challenges posed by the COVID-19 pandemic, the development of remote participatory mapping techniques has the potential to aid both mapping and conservation efforts, considering the exacerbated deforestation rates of the last decade.

As an archaeologist partnering with Indigenous Emberá communities, I am working to make my research process and results reflective of how community partners interact with the landscape. In the survey phase of research, this has meant considering archaeological sites as archives of place-based knowledge, which has both specified and expanded our corpus of material for archaeological study. Although this perspective arose from our work in the Indigenous landscape of Darién, I believe that place-based survey and community-defined site taxonomies address common Indigenous concerns about the decontextualization and appropriation of knowledge, as reflected in the broader literature of Indigenous archaeology, and are therefore useful approaches for all practitioners of Indigenous archaeology to consider.

Chapter 5
Practice-based zooarchaeology and place-based knowledge: Persistence of Indigenous landscape management and cuisine in the Mayales River Valley, Chontales, Nicaragua

The laboratory analysis phase of the research cycle has been theorized much less than archaeological survey and excavation within collaborative archaeology, aside from the extremely important discussions of the ethics and responsibilities entailed in work with human ancestors (see Bader et al. 2020; Bardill et al. 2018; Tsosie et al. 2020; Wagner et al. 2020). However, work carried out by technical specialists, often in universities far away from the fieldwork context, directly affects community partners. The hypotheses that researchers have about the collection they are working with and the criteria they use to evaluate the assemblage both have direct effects on the results of the analysis. If fieldwork is designed to reflect Indigenous place-based knowledge held by community members, but laboratory analysis is not, the project may end up reproducing the same biases that it was established to evaluate.

There are, however, more challenges involved in making this work collaborative. As described above, it often takes place in multiple, dispersed universities, far away from the fieldwork context where community partners live.[28] It often involves specialized equipment, and archaeologists may contract some of their analysis work out to scientists in other disciplines.[29] It is also common practice for archaeological laboratory specialists to have never set foot in the fieldwork context or to have spent little time there, even on otherwise collaborative projects. And while archaeologists have come to see the value of local, place-based knowledge in fieldwork, we tend to think that laboratory analysis is more technical and scientific, and therefore less reliant on other knowledge systems. However, there is a recognition in other sciences, such as genomics, that cultural values influence the way that scientific tools are used and interpreted, and therefore the involvement of communities in laboratory research is critical (see Claw et al. 2018). Particularly when conducting collaborative archaeological research with Indigenous communities in the United States and Canada, laboratory analysis is becoming increasingly important, as communities are often more interested in analysis of legacy collections than excavation of new sites (see Moore 2022). Therefore, developing methodologies for collaborative archaeological laboratory analyses is more important than ever.

Because of these difficulties and the lack of discussion of this issue within archaeological scholarship, the framework presented in this chapter is a work in progress. While some of the laboratory work was conducted in the field house laboratory in Chontales, where community members worked with me on the initial stages of faunal analysis, most of the analysis was conducted at the University of California, Berkeley, without continuous input from community members. As I will discuss, while I selected the analytical framework I used because of its compatibility with the place-based knowledge that had been shared with me, I made that choice unilaterally. And because of the overarching design of the archaeological project, which initially did not include zooarchaeological research and in which I did not have a leadership role,

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[28] A distinct but related issue can arise when descendant communities are not local, often the result of Indigenous displacement from ancestral territories. A place-based knowledge framework can still apply in these cases but may entail additional complications.

[29] These laboratories have often not been subject to the same ethical protocols as archaeological laboratories. See Bader et al. 2023 for a discussion of this issue and the NAGPRA responsibilities of radiocarbon dating and other laboratories that have received human remains from archaeologists.

community member involvement in determining the research questions that are addressed here was also implicit rather than explicit. Because I lived in Chontales for cumulatively over a year, I became aware of questions of import to some community members, but this analysis does not address questions or concerns generated through any formal process of collective governance, unlike the previous chapter.

That being said, because of the importance of laboratory analysis to the process of archaeological knowledge production and to Indigenous communities, I wanted to present these preliminary thoughts on the importance of engaging place-based knowledge in technical archaeological analyses and some of the methods for doing so in a zooarchaeological context. Close fieldwork collaborations with communities in Chontales furnished a vivid impression of places imbued with meaning through the animals brought into them, while these animals in turn acted as indices of other places. I came to realize there was scope for the development of laboratory methods to study the role that animals and their remains play in human placemaking, taking a technological approach as its point of departure. Here, I consider faunal assemblages as archives of place-based knowledge that is learned and transmitted, reflecting the embodied experience of relating to animals.

A practice-based approach to zooarchaeology

The study of human-animal relations on a millennial scale is important for both archaeological interpretations regarding foodways and culture change in Central Nicaragua (Chontales Province) and for understanding the transition to a cattle ranching economy and its accompanying contemporary social and environmental implications. These human-animal relationships had symbolic as well as more quotidian dimensions, which can be studied by incorporating place-based knowledge held by contemporary community members into archaeological practice. Proyecto Arqueológico Centro de Nicaragua (2007-2017), directed by Alexander Geurds, was the first Central Nicaraguan archaeological project to collect faunal remains during excavations and, therefore, this chapter presents the results of the first zooarchaeological study in this region to date. Specifically, these faunal remains come from six sites in the valley north of the modern city of Juigalpa, watered by the Mayales River and *quebradas* (seasonally inundated ravines) and minor streams of the Mayales River subbasin, which discharges into Lake Cocibolca, the largest freshwater lake in Central America (Garayar 1972; Montenegro-Guillén 2003). Unfortunately, poor preservation due to the shallow nature of sites, cattle trampling, and soil chemistry resulted in an extremely fragmentary and limited assemblage. Despite these limitations, because these are the only samples that exist for this entire region—which bridges the Pacific and Caribbean parts of the country—it was important to design an analysis that would maximize their potential contribution to archaeological knowledge.

Although the sample size is small (n=848) and poorly preserved, a practice-oriented approach to zooarchaeology, when combined with high-resolution microstratigraphic analysis and contemporary place-based knowledge, can yield significant insights concerning both spatial and temporal patterns of human activity within a particular area. This approach used both ecological and technological frameworks to derive archaeological inferences. While ecological insights are commonly applied within zooarchaeological interpretation and appear throughout this chapter, I focus here on explicating a technological approach, grounded in practice theory, which is less prevalent in zooarchaeological analysis (but see Seetah 2019).

Identifiability and a technological approach to zooarchaeology

Within traditional zooarchaeological practice, fragments are generally initially sorted into "identifiable" and "non-identifiable" categories. Only those classified as "identifiable" are considered further, with the "non-identifiable" fragments being disregarded altogether. However, this designation is based on being able to identify a fragment to a particular taxonomic category, which would remove much of the present already small sample from further analysis.

Despite the many critiques of this "species list" approach, wherein taxonomic identification is a prerequisite for any other type of analysis (Olsen 1971; Glassow and Joslin 2012; Reitz and Wing 1999; Robison 1978; Smith 1976), it continues to be widely employed. However, as in this case, "unidentifiable" specimens may still yield important information concerning, for example, cooking, depositional and post-depositional practices (see Badenhorst and Plug 2011; Marean et al. 2004; Turner 1989). Even in assemblages with better overall preservation, recording the fragmentation, burn patterns and cut marks present on "non-identifiable" fragments may significantly affect the proportions of such occurrences, which may alter interpretations of these contexts. Some practices, such as trash burning and deposition in heavily trampled areas, may consistently result in high degrees of fragmentation and thus consistently "unidentifiable" elements. Therefore, exclusion of these specimens may result in an omission of certain practices altogether.

Even with this high degree of fragmentation, however, this assemblage was able to shed light on human-animal relationships within pre-Hispanic Central Nicaragua and illustrate the potential for interpreting zooarchaeological remains using a technological framework. Like practice-based models of ceramic and lithic industries, which involve production, consumption and disposal, faunal exploitation for consumption purposes can be broken down into stages, each with its own *chaîne opératoire*, and communities of practice can be identified within each stage (Lemonnier 1992; Leroi-Gourhan 1964; Sellet 1993). I break this down into four basic steps: (1) procurement, (2) butchery, (3) cooking/consumption and (4) disposal of remains.

Procurement and transportation

The first stage of the faunal processing sequence, procurement, involves the selection of a particular animal species or group of species. It is here that taxonomic information is especially important, to infer knowledge of animal behavior that might be important in a successful hunt. Thus, the "species list" approach does have some utility within a technological framework if insights from ecology and animal behavior are used as aids in interpreting significance. Ecological knowledge is not only important for making archaeological inferences but was and continues to be employed by hunters to determine the most suitable method for capturing and killing members of a particular taxon or subset of a population.

This knowledge is not intuitive but must be transmitted and learned. The teaching of hunting strategies has been documented extensively within ethnographic contexts (see Hewlett and Cavalli-Sforza 1986; Ohmagari and Berkes 1997; Pearce et al. 2011, 2015). And although archaeologists have discussed hunting strategies and knowledge transmission with regard to technical implements (see Damlien 2016; Lombard 2015), too little attention has been paid to this within zooarchaeology, with a specific focus on knowledge of animal ecology and behavior. Hunters tend to be stewards of high-level placed-based knowledge that entails a holistic understanding of the landscape, which must also be learned. Zooarchaeological analysis, therefore, can attempt to elucidate this place-based knowledge evidenced by in animal remains, as well as how it is shared.

Variables other than taxon can be informative regarding procurement strategies as well. Age and size profiles, for example, can be informative concerning the intentional targeting of specific individuals within a species group (see Atici 2009; Bunn and Pickering 2010; D'errico and Vanhaeren 2002; Bar-Oz et al. 2011; Lubinski 2013; Munro 2004; Yeshurun et al. 2007), as well as seasonality (see Adler and Bar-Oz 2009; Atici 2009; Dewar et al. 2006; Rendu et al. 2012). Statistical overabundance of a particular sex, age and/or size class can be indicative of targeting of individual animals with a more active hunting strategy (e.g., spears or projectiles), whereas a more distributed demographic profile could be indicative of trapping or game drives. This type of demographic information can also be used to argue for domestication or penning practices that predate morphometric or genetic changes in the species (see Crabtree 1993; Hesse 1982; Russell et al. 2005; Zeder 2001; Zeder et al. 2006; Zeder and Hesse 2000). Each of these strategies, which can co-occur, can be considered a particular community of learning and practice.

Presence and absence of different skeletal elements is also indicative of the transportation aspect of procurement. Once again relying on the logic of optimization models (see Metcalfe and Barlow 1992), this has been discussed primarily in terms of the "schlepp effect," where "[t]he larger the animal and the farther from the point of consumption it is killed, the fewer of its bones will get 'schlepped' back to the camp, village, or other area" (Daly 1969: 149). This tendency results in an uneven distribution of elements and often a bias toward bones that bear more edible, tender meat (see Lupo 2006). However, the significance of the schlepp effect can be expected to diminish drastically if procurement is being carried out close to the place where the animal will be consumed or otherwise used. There is often an implicit assumption that hunting (especially of large mammals) is an activity that involves traveling a considerable distance, but that may not be the case. This example underscores the importance of explicitly modelling the procurement strategy that is expected in a particular research context, which includes taking the behavior and ecology of individual taxa into account.[30]

Butchery

Cut and chop marks are the material manifestations of the bodily practice of butchery, which is executed in a particular way, resulting from an intersection between cultural norms related to foodways, preparation implements, and aesthetic preferences; the anatomy of the animal; and individual situation, decision and capability. This "individual" aspect is paramount; while the other life history stages of animal consumption are also practices absorbed through situated learning scenarios, they do not leave traces that can be related back to an individual or definable group of individuals. Butchery, therefore, affords a particular opportunity for exploring legitimate peripheral participation (defined by Lave and Wenger 1991 as the process by which newcomers become experienced through social learning) within past communities of practice. While the learning processes of lithic and especially ceramic production have been explored within archaeology (see Bamforth and Finlay 2008; Crown 2006; Minar and Crown 2001; Wendrich 2013), learning within butchery contexts has been understudied archaeologically, likely due to its association with subsistence rather than craftsmanship (but see Blasco et al.

[30] This example is related to long-running debates in the field about the efficacy of using Human Behavioral Ecological (HBE) models, derived from non-human animal behavior (Cronk 1991), to explain human behavior. This is a more complex issue than I take up here (see Bird and O'Connell 2012; Gifford Gonzalez 2018 for reviews and examples of HBE applications within zooarchaeology).

2014; see also Blasco et al. 2013 and Vettese et al. 2017 for interesting explorations of Neandertal social learning through butchery practices).

Ethnographic work, however, has demonstrated the considerable cultural variability of butchery methods, which can be described through the frameworks of social learning and communities of practice. For example, Lewis Binford (1978) meticulously documented the specific, prescribed method of processing caribou feet among the Nunamiut, which is passed down through generations. Archaeologically, trends in the positioning of cutmarks in relation to bone axis and anatomical landmarks within a particular taxonomic class provide one line of evidence for such a lineage or community of practice. Microscopy of these marks can provide another by evidencing the types of tools involved, particularly when compared with the tool types and lithic or metal raw materials found in each context.

Another aspect of legitimate peripheral participation that has been explored archaeologically, once again primarily in the context of ceramic production, is identifying learners themselves. For example, Crown (2006) explores this by identifying misshapen pots and imperfect design work, seeing these mistakes as indicative of individuals on the periphery of the community of practice. Within carcass processing, learners can be distinguished through evidence of "redundant butchery." A highly skilled butcher leaves little or perhaps no trace of their efforts on the bone, as the aim is often to dismember the animal by cutting through the less dense soft tissue and then filet the meat without chopping into the bone itself. An individual in the process of learning, without this embodied knowledge of the animal musculoskeletal system, will likely gratuitously strike the bone, resulting in concentrations of marks and failed chops, which can be identified in the zooarchaeological record (Gifford Gonzalez 2018).

Consumption and disposal

A focus on foodways, particularly signatures of cooking, has been prominent in zooarchaeological research for decades, especially within historical archaeology (deFrance 1996; Pavao-Zuckerman and Loren 2012; Welch and Scarry 1995). Refuse disposal, however, as the final component of the faunal exploitation process, has been the least explored from a technological standpoint. Very little has been written with regards to the relationship between food discard and social diversity in any capacity, and this limited corpus of literature has focused on ritual acts of deposition (Baires et al. 2023; McNiven 2013; Twiss 2012). Yet, quotidian deposition is an integral aspect of daily practice and illustrates the development of multiple communities of practice within this relatively small survey area in Central Nicaragua. It is an especially important source of evidence within this context because it relies primarily on taphonomy, the traces of site formation processes, and therefore it can be explored even in environments with poor organic preservation and high levels of disturbance that often preclude identification to species and element.

I will focus on each of these four stages as an opportunity for embodied performances that, if transmitted from person to person, engender practices executed by communities, whose existence is maintained and revitalized through these same practices. These practices also entail the learning and enactment of place-based knowledge. In other words, practice, knowledge, and community are mutually dependent and co-constituted. The remainder of this chapter will apply a technological approach to the faunal remains recovered from PACEN's excavations in the Mayales River Valley.

Central Nicaragua: Study Area and Context

The valley of Juigalpa is located approximately 25 kilometers north-east of the shore of Lake Cocibolca, in the transition between two physiographic provinces: the Nicaraguan Depression and the Interior Highlands (McBirney and Williams 1965; Schmoll et al. 1975). More precisely, the valley is situated at the start of the Central Interior Highlands, characterized by rolling to mountainous volcanic deposits from the Tertiary (McBirney and Williams 1965). The Mayales River, which originates in the highlands and flows into Lake Cocibolca, forms a subbasin that waters the valley, playing an important role in human-environmental interactions since humans first occupied the area by at least 300 CE (most likely significantly earlier) through the present (Donner 2020).

Since 2007, the Proyecto Arqueológico Centro de Nicaragua (PACEN), under the direction of Alexander Geurds (Leiden University), has conducted a systematic research program in the region. PACEN's research aims to move away from the focus on unidirectional, large-scale migrations and cultural diffusion that has long characterized archaeological scholarship in not just Central Nicaragua, but most of Lower Central America (see Chapters 2 and 3). Instead, the project was premised upon a bottom-up approach that examines local developments in their own right and treats continuity not as a default condition, but a state of practices that are actively maintained (Geurds and Van Broekhoven 2010). The project has investigated the construction of households, the structure and evolution of public space, agriculture, settlement patterns in relation to local geomorphology, and regional interconnectivities to eventually characterize the region's relationships with both the Pacific and Caribbean watersheds (Geurds et al. 2008).

Between 2015 and 2016, a systematic, high intensity, surface survey was undertaken in a 52 square kilometer area, north (42 square kilometers), south (9 square kilometers), and east (1 square kilometer) of Juigalpa, which was then followed by stratigraphic excavations within the northern section. In total, 18 archaeological sites, both mounded and unmounded, were tested with the goal of redefining the chronology of human presence in the valley from a practice-based perspective (Donner 2020; Donner et al. 2018; Donner and Geurds 2018), particularly centered around ceramic technical traditions but also taking into account other ways of doing, such as lithic production, mound construction, and human-plant and human-animal interactions. A total of 12 sites yielded zooarchaeological remains, spanning from 300-1900 CE and providing evidence of socially learned practices involving human and animal communities (Figure 11).

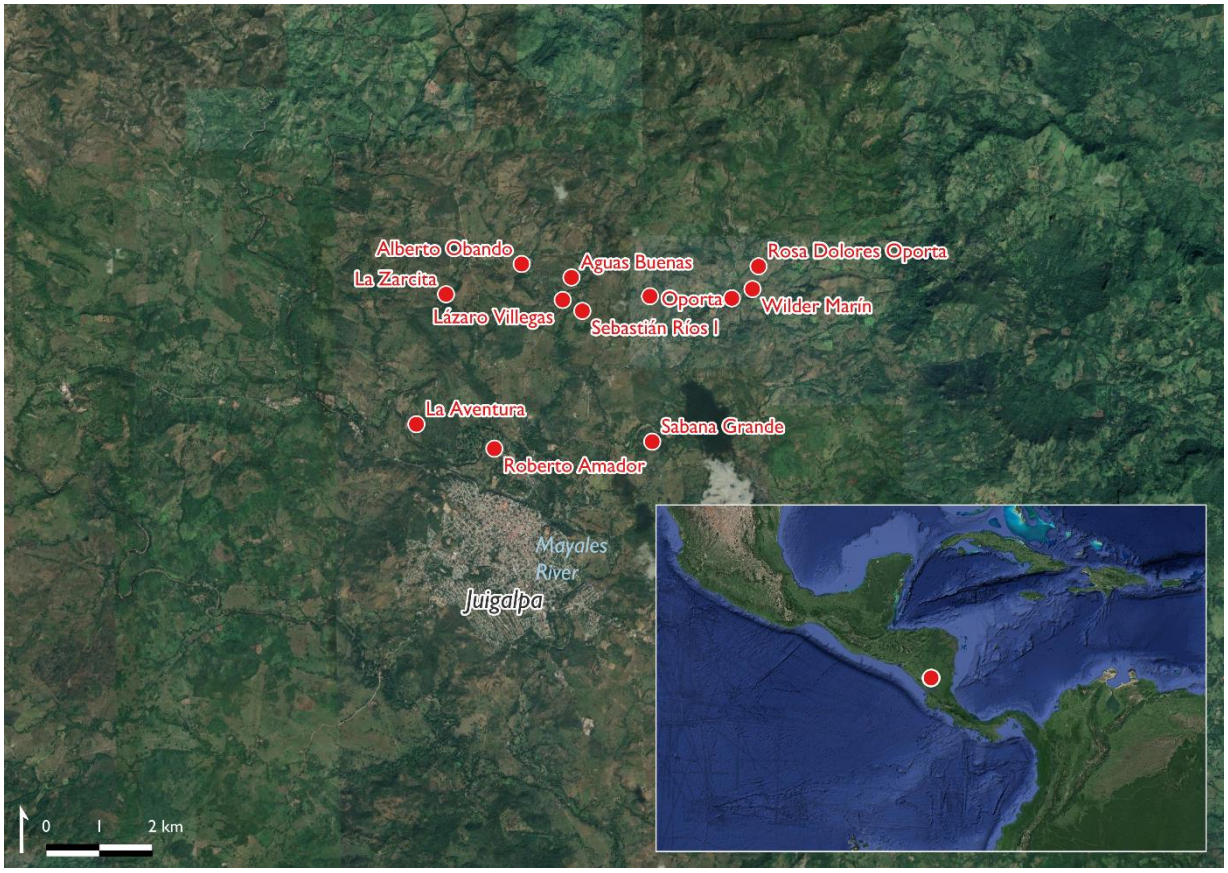

Figure 11. Mounded archaeological sites excavated by PACEN in the Mayales River Valley that yielded faunal remains, shown in relation to the Mayales River and the city of Juigalpa.

Site Descriptions

As a result of these excavations and subsequent laboratory analyses, a five-phase chronology of the region was proposed (see Donner 2020 for details):

The first period, Period I, spans from 300-900 CE and includes the following sites that yielded faunal remains: Lázaro Villegas, Alberto Obando, and Sebastian Ríos I. All are located within a 500-meter radius of Aguas Buenas, the most labor-intensive construction effort within the Mayales valley (see below). Alberto Obando was dated through accelerator mass spectrometry (AMS) radiocarbon dating of charred residues in the interior surface of a ceramic vessel (Donner and Geurds 2020); the other two sites were dated relatively, based on a technological approach to their ceramic assemblages (Donner 2020). Lázaro Villegas is located 150 meters south of Aguas Buenas and may have been contemporaneous with the first phases of monumental construction at that larger site. Lázaro Villegas is comprised of 146 mostly circular mounds, built of both rock and sediment, constructed around four plazas (Arteaga Saucedo 2017). Sebastián Ríos I is situated 400 meters south of Aguas Buenas, on the same rock formation as Lázaro Villegas. This site features 31 mostly circular mounds, built with rocks and sediment, distributed around a rectangular plaza that encloses the largest mound of the cluster, of an unusual rectangular shape. Finally, Alberto Obando consists of 16 circular mounds built of rock and sediment, organized in a circular pattern, featuring a communal area surrounded by structures but with two mounds inside its perimeter.

Period II ranges from 900-1250 CE. Of the sites yielding faunal remains, Roberto Amador, Oporta, and Sabana Grande (excavation unit 1) were dated through radiocarbon assays (Donner and Geurds 2018). The first site is oriented to the Mayales river, while the other two are located by the Los Copelitos-Carca stream. Aguas Buenas and La Zarcita, both located alongside smaller seasonal quebradas, were provisionally placed within this period through relative association based on ceramic manufacturing practices. Aguas Buenas is comprised of 371 anthropogenic mounds built mostly with rock and sediment, forming an ellipsis with six concentric arcs and a rectangular plaza in the center. Recent 3D mapping of the site resulted in the proposal of multiple construction moments that combined circular and linear arrangements together with clustered structures (Auziņa 2018). Although initial human activity at the site corresponds to Period I, excavation unit 2 was placed at the eastern sector of the site, which is believed to be later (Gorin 1990; Rigat 1992).

La Zarcita is comprised of 37 circular mounds of rock and sediments, arranged in two semi-ovular plazas, and five mounds on the slope east of the main cluster of mounds (Arteaga Saucedo 2017). The northern plaza features three interior structures, whereas the southern one has none. Roberto Amador consists of at least 25 circular mounds distributed in two distinct sections, featuring a possible plaza on its northern sector, where the largest mounds are found (Arteaga Saucedo 2017). Oporta has 32 mostly circular mounds, built with rocks and sediment, arranged in two different plazas or clusters. Sabana Grande consists of 80 circular mounds, built with rock and sediment, with at least one plaza. Conservation issues, however, precluded a full assessment of the spatial organization of the structures at this site.

Period III ranges from 1250-1450 CE. It includes two sites that yielded faunal remains: Rosa Dolores Oporta (excavation units 1 and 2), which was dated through absolute techniques (Donner and Geurds 2018), and Wilder Marín, chronologically placed through ceramic association. Rosa Dolores Oporta is comprised of two sections. The northern, dated to Period III, consists of nine circular mounds built with rocks and sediment forming at least one plaza. Wilder Marín consists of 66 circular mounds constructed with rocks and sediment, arranged in two semi-rectangular plazas aligned NE-SW (Arteaga Saucedo 2017).

Period IV ranges from 1650-1900 CE, including the sites of Sabana Grande (excavation unit 2); Rosa Dolores Oporta, situated in association to the Los Copelitos-Carca stream; La Aventura, located by the Mayales river and the Gueguestepe hill; and Sebastián Ríos Histórico, situated on an elevation and associated to seasonal streams near Aguas Buenas. Excavation unit 2 at Sabana Grande is located a few meters from the Period II portion of the site, within the same configuration formed by the 80 mounds described above. However, in contrast to the older component, this off-mound unit featured a rock-paved floor. The Period IV portion of Rosa Dolores Oporta is located on a slope south of the older plaza and features 19 circular mounds arranged in a V configuration. La Aventura is comprised of 21 circular mounds, separated into two clusters. Preliminary analysis indicates that the southern section of the site is later than the northern part. Spatial organization of the site appears to follow natural topography; however, partial destruction and modern re-use could have rendered geometric configurations less visible. Sebastián Ríos Histórico, the only site lacking mounds that is incorporated within the survey area, yielded colonial materials on the surface.

Period V ranges from 1900-present CE, which cannot be addressed by faunal remains from archaeological sites at this time. However, contemporary human-animal relationships in the form of place-based knowledge shared by community members will be employed in the

interpretation of faunal remains from other periods where relevant, and research is currently being conducted to address this period, which will be discussed at the end of the chapter.

This chapter will present and discuss the results from six of these sites: Aguas Buenas, La Aventura, Oporta, Roberto Amador, Sabana Grande, and Sebastián Ríos Histórico. While six other sites also yielded faunal remains (Alberto Obando, Lázaro Villegas, Rosa Dolores Oporta, Sebastián Ríos I, Wilder Marín, and La Zarcita), the material from these sites is excluded from this analysis because the specimens were modern or of a more recent chronology than the other archaeological material from these sites. Out of an NISP of 68 from these six sites, 64 specimens (94.1%) were positively identified as domestic cow (*Bos taurus domesticus*), which, along with their superficial context, indicated that they did not date from the ancestral occupation of the site; radiocarbon dating and material culture indicates that these sites were occupied between approximately 400 and 1400 CE, prior to the introduction of European domesticates (Donner 2020; Donner and Geurds 2018). Unfortunately, the lack of contextually sound data from these sites means that Periods I and III cannot be addressed in this analysis. Therefore, this chapter focuses on Period II (900-1250 CE) and Period IV (1650-1900 CE). The gap in available data from 1250-1650 CE—which includes the first Spanish colonial presence in the region—unfortunately limits the resolution of analysis and questions that can be asked about the relationship between these two chronological periods. The analysis presented here was designed with this limitation in mind.

La Pachona is another mounded archaeological site oriented NE-SW, with at least 27 elliptical and ovular mounds on slopes, with a large empty space at the site's center, interpreted as a possible plaza (Donner 2020). One large oval platform mound (45 x 15 meters) was also identified at La Pachona, much larger than the average mound size for the area, which ranges between 8 and 20 meters. These mounds incorporate mortuary components. Some similarity in function has been proposed between La Pachona, Roberto Amador, and Sabana Grande based on the very high quantities of similar ceramic and lithic materials on the surface, as well as similar mortuary contexts at La Pachona and Roberto Amador. However, La Pachona is associated with the Cuisalá River rather than the Mayales River and is not part of the Mayales River Valley, as it is located south rather than north of the town of Juigalpa. Additionally, it was excavated by PACEN according to the quadrant method of mound excavation, which exposed a much larger area of individual mounds (~6x6 meters), rather than the much smaller approximation trenches described here. Therefore, results from the faunal analysis of this site will be published elsewhere, but selected results have been included here where relevant, although never in a quantitative context given the difference in excavation methodology.

Excavation Methodology

The main objective of the excavations consisted in understanding the region diachronically through the study of the history of ceramic manufacturing practices. To do so, PACEN applied two different excavation strategies. First, we conducted 2x2 meter off-mound stratigraphic test pits, always placed on flat terrain surrounded by mounds, interpreted as communal areas. Second, we undertook either 1x1, 2x1, or 3x1 meter "approximation" trenches to approach different types of mounds. Excavations combined geological and archaeological stratigraphy with arbitrary 10-centimeter levels, to maximize a precise control of stratigraphic unit (SU) changes as well as specific locations of artifacts. Documentation was performed following stratigraphic criteria in Harris (1979), and materials were separated both by SU and arbitrary metric levels. All removed sediment was screened separately; the standard sieve

employed was 5 millimeters, while a 1-millimeter sieve was used for features and contexts with high concentrations of archaeological materials. Samples for macro- and microbotanical studies, as well as for organic sediment dating and chemical characterization of clays and soils, were also retrieved. Photographic records include finds, samples, photogrammetry, plan, and profile pictures. Drawings were carried out for all features, the start of each new SU, and all four profiles of each unit.

Laboratory Methodology

In the field laboratory, all faunal bones were cleaned using dry brushing, and a preliminary inventory and analysis was conducted. These specimens were then exported to the United States for further analysis at the University of California, Berkeley. Data was recorded in a Microsoft Access database, designed to facilitate the collection of taxonomic, anatomic and taphonomic data without privileging any one category. Data was tabulated according to criteria based on coding schemes drawn from Behrensmeyer (1978), Johnson (1985), Buikstra and Swegle (1989), Villa and Mahieu (1991) and North Atlantic Biocultural Organisation (2010). Thus, all entries were either metric or ordinal data points. Each fragment received its own entry in the database, including "unidentifiable" fragments, with the exception of fragments with the exact same taxonomic, anatomic and taphonomic coding, which were grouped by size classes of 10 millimeter ranges. Each fragment or group of fragments was photographed with a Canon EOS T5 Rebel DSLR camera, and fragments with cut marks were photographed at higher levels of magnification with a Dino-Lite portable microscope. Fragments believed to be modified for use as tools or repurposed were imaged with a Hitachi TM1000 scanning electron microscope at the University of California, Berkeley.

Results

Taxonomic overview

Of the fragments that could be identified to a taxonomic class (n=767), approximately 72% were identified (n=550) as mammals (Mammalia), 12% (n=94) as reptiles (Reptilia), 12% (n=91) as birds (Aves), 3% (n=23) as bony fish (Osteichthyes), <1% (n=7) as gastropods (Gastropoda) and <1% (n=2) as bivalves (Bivalvia). 10% (n=81) of the total remains (n=848) were not identifiable to a taxonomic class. In this context, however, taxonomic information by itself only goes so far. This assemblage is extremely fragmentary, with an average maximum length of only 11.25 millimeters. Only 1.5% (n=13) of total specimens are complete, and 82.8% (n=702) comprise less than 50% of the circumference of the element, severely limiting feasibility of more specific identifications. Therefore, the majority of this chapter focuses on the results of technological analysis of these same specimens.

Procurement and transportation

The white-tailed deer (*Odocoileus virginianus*) was the most ubiquitous species identified within the Mayales River Valley assemblage. During Period II (900-1250 CE), white-tailed deer remains comprise 47% of the assemblage (n=280). This corresponds with the average at both Roberto Amador (49%, n=111) and Sabana Grande (46%, n=166). These percentages vary at Aguas Buenas (50%, n=1) and Oporta (14%, n=2), but the assemblages are too small to consider this as any significant indicator and do not contribute to the overall average. During Period IV (1650-1900 CE), white-tailed deer were not identified within the assemblage at Sebastián Ríos Histórico but are present at La Aventura. The following section will focus on the Period II sites

due to sample size, but human-deer interactions during the colonial period will be discussed later in the chapter. Remains of the Central American agouti (*Dasyprocta punctata*), collared peccary (*Pecari tajacu*), gray four-eyed opossum (*Philander opossum*), and lowland paca (*Cuniculus paca*) were present at Sabana Grande and La Pachona, both sites that date to Period II, but in minimal quantities by comparison to the white-tailed deer.

While sexing was impossible given the preservation and particular elements present in the assemblage, the age profile is suggestive of a pattern. Of a minimum number of 12 white-tailed deer individuals recovered from contexts at Roberto Amador and Sabana Grande, at least 7 (58%) were identifiably within late subadulthood, between 17-23 months of age based on epiphyseal fusion patterns (see Purdue 1983; Reitz and Wing 1999). This pattern suggests that the pre-Hispanic occupants of these sites did not rely on cooperative driving strategies that aim for mass kills and result in faunal assemblages with a lack of age structure. Rather, they likely favored hunting practices in which individual humans targeted individual deer of a particular age class. Interestingly, lithic analysis by Samuel Jiménez Castillo (2017) has demonstrated that these sites had a distinct bifacial production industry from all other sites in the subbasin, which included the extensive manufacture of hunting implements, suggestive of individual hunting. Additionally, the white-tailed deer remains recovered represent almost all parts of the animal and do not vary significantly or in a patterned way by anatomical element, suggestive of transportation of the entire animal from the kill site back to the site of occupation.

Butchery

In the Mayales River Valley, one butchery lineage stands out as emergent during Period IV (1650-1900 CE). At both La Aventura and Sebastián Ríos Histórico, long bone shafts exhibit chop marks from being split both parallel and perpendicular to the bone axis. While perpendicular chops appear in the Period II assemblages as well, parallel chops resulting in long, thin fragments of long bone do not appear in contexts from the Mayales River Valley until Period IV. The particular shape of these fragments is characteristic of the practice of splitting open long bones in order to extract bone marrow (following Alcántara García et al. 2006; Capaldo and Blumenschine 1994). The longitudinal fractures appear to have been created using metal instruments, as demonstrated by visual inspection of transverse sections of the fracture surface (following Okaluk and Greenfield 2022).

One stratigraphic unit from Sabana Grande yielded two elements with almost identical butchery patterns; however, one has noticeable redundant chops that did not pass cleanly through the element but would not have disarticulated ligaments, tendons, or muscle. These chops also would have created bone splinters, not ideal for meat destined for consumption. The other element has no such marks. The coexistence of both specimens in one context may suggest the concurrent presence of skilled and less skilled butchery, potentially illustrative of the crafting nature of butchery and its perpetuation through legitimate peripheral participation.

Consumption and disposal

During Period II (900-1250 CE), represented here by the sites of Aguas Buenas, Oporta, Roberto Amador, and Sabana Grande, unweathered bones lacking carnivore or rodent secondary consumption make up most of the assemblage. Many of these were immediately burned after being consumed at a high temperature for a long period of time, causing calcination. Along with visible comminution of the assemblage, these taphonomic markers suggest burning as a refuse disposal practice at these sites. However, there is almost no evidence of carbonization, indicative

of roasting, suggesting that meat was preferentially steam cooked or boiled. The suggestion of steam cooking is further supported by the presence of colanders at all of these sites, as well as traces of boiling and over-boiling on ceramic sherds dating to this time period (Donner 2020).

During Period IV (1650-1900 CE), however, the taphonomic distribution is shifted towards heavier weathering, with visible carnivore tooth furrows, indicative of prolonged exposure on the surface prior to interment and subsequent consumption by other animals, most likely dogs living near human settlements. These specimens bear no sign of high-temperature burning, unlike the remains from Period II, but show considerable evidence of mid-temperature burning (approximately 350 degrees Celsius), as in a cooking fire, which is rare during Period II. This carbonization is concentrated at the articular surface (where the bones are disarticulated, thus exposing this region) of meat-bearing skeletal elements, particularly the pelvis, ribs, and various long bones, suggesting an increasing reliance on roasting of meat on the bone as a cooking method.

When the assemblages are distinguished by site and stratigraphic units within sites and taxonomic information is taken into account, however, a more complicated picture emerges. At Sebastián Ríos Histórico, a Period IV site, domestic cow (*Bos taurus domesticus*), domestic goat (*Capra aegagrus*), domestic sheep (*Ovis aries*), and domestic pig (*Sus scrofa*) comprised the majority of the faunal assemblage. However, 19% (n=26) of the assemblage from the deepest stratigraphic unit at the site consisted of Mesoamerican slider (*Trachemys* sp.) remains.

The assemblage at La Aventura is much smaller than that of Sebastian Rios Histórico, and therefore any suggestions are more tentative. However, it is interesting to note that white-tailed deer remains (*Odocoileus virginianus*) of the same age profile described earlier in the chapter (17-23 months in age) co-occur in this assemblage with European domesticates, including the domestic cow (*Bos taurus domesticus*). Additionally, unlike Sebastian Rios Histórico, none of the faunal remains from this site bear evidence of carbonization, but there is evidence of calcination, which is entirely absent at Sebastian Rios Histórico.

Discussion

Taxonomic overview

The lack of zooarchaeological analyses conducted in this area to date prohibits detailed comparative study. However, there some insights can be gained from a coarse-grained analysis. Of identified remains from the site of San Cristóbal, for example, located on the south shore of Lake Managua, only 17% were mammals, while the vast majority (74%) were fish (Rewniak et al. 2013). The inhabitants of this site relied less on reptiles (4%) and birds (2%) than did the inhabitants of the Mayales River valley. The taxonomic composition of Santa Isabel, located on the western shore of Lake Cocibolca, echoes the pattern exhibited by San Cristóbal in terms of a relatively low proportion of mammals (12%) in comparison to fish (47%), although with significantly more reptile presence (30%; Hoar 2006; Lopez-Forment Villa 2008). Kukra Hill, a site on the Caribbean coast of Nicaragua, follows suit, with fish comprising 49% of identified elements and mammals only 3% (Lara Kraudy 2004). Like Santa Isabel, this site yielded a very high proportion of reptiles (45%), the vast majority of which at both sites were identified as turtles. This is likely due to many turtle plastrons and carapaces, both of which preserve well in archaeological contexts.

In analysis of a fragmentary assemblage such as this one, ecological principles are essential for developing archaeological inferences that go beyond coarse-grained description. For example, although all sites included in this study are in proximity to a water source, many of

these are classified as first order streams, which have been shown to have significantly smaller and less diverse fish populations than streams of higher orders (i.e. those with inflow from a larger area), not to mention the lakes or oceans that neighbor the aforementioned sites (Whiteside and McNatt 1972). The substitution of mammals in the place of fish for the majority of caloric consumption in the Mayales river valley makes sense in this context.

However, the presence of some aquatic species in Mayales River Valley assemblages can shed light on the relationships formed between humans and nonhuman animals in aquatic environments, as well as the paleoecology of the Mayales River. For example, three turtle genera were present in the assemblage: *Chelydra*, *Trachemys* and *Kinosternon*. Remains of a South American snapping turtle carapace (*Chelydra acutirostris*) showed cut marks on the bridge, resulting from disarticulating the carapace from the plastron, characteristic of consumption. This species inhabits riverine environments, most commonly found in wider zones of rivers with low visibility, high turbidity, slow currents, shade, deep water and mud, elevated nutrient accumulation, high organic material and active decomposition, floating logs, and high quantities of small fish, which the turtle subsists on (Medem 1977). Thus, the presence of this species, especially given the lack of other paleoenvironmental data, can be used to construct hypotheses about the various micro-ecosystems that existed within the Mayales and its tributaries during the occupation of these sites. The Mesoamerican slider (*Trachemys* sp.) is highly aquatic and would also likely have been hunted from a riverine area with abundant aquatic vegetation, open land for basking and nesting adjacent to the stream, and slow currents, similar microecosystem requirements to the snapping turtle (Moll and Legler 1971). Both species cannot move any significant distance over land and so tend to live in areas that are permanently inundated (Medem 1977; Moll and Legler 1971).

This is the first faunal analysis of inland sites from Nicaragua, and therefore future studies are needed to determine whether the relative lack of fish remains, in comparison to especially mammal but even bird and reptile remains, is consistent in other such sites. Although some small freshwater fish are present, they are a small proportion of the assemblage, suggesting that these species may not have been a significant part of the diet for inhabitants of the Mayales River Valley. The results of this study also suggest that inhabitants of this river valley were not accessing Lake Cocibolca for regular subsistence purposes despite living only 25 km from its eastern shore, although analysis of faunal remains from a mounded mortuary context within the Mayales River Valley, La Pachona, has yielded a bull shark (*Carcharhinus leucas*) tooth pendant and a tropical gar (*Atractosteus tropicus*) vertebra, both of which would have been fished within Lake Cocibolca.

Despite the paucity of fish remains in the archaeological record, fishing is an important cultural activity in Chontales today; indeed, despite their relative lack of dietary importance today (as well as, perhaps, in the past) fish were the most discussed animal in conversations with Chontaleños, illustrating the cultural importance of maintaining connections to the Mayales and to its fish communities. This knowledge also has implications for our interpretations of archaeological assemblages. For example, Chontaleños lament the continuing decline of fish in seasonal quebradas due to decreasing rainfall that they have observed and attribute to land clearing for cattle ranching. They say that although it is still possible to carry out some fishing in winter, when some fish enter the quebradas from the Mayales River, they no longer see any fish or snails in the summer months, as they used to (Doña Minar, Doña Nidia, and Doña Toña 2020, personal communications).

This focus on fishing in the quebradas is interesting to consider for interpreting hunting and fishing strategies illustrated by archaeological assemblages. For example, as I described above, the turtle species hunted in the Mayales River Valley require environments of permanent inundation, and I had previously thought that the Mayales River itself was the most likely candidate for where these animals were hunted. However, given the knowledge that many of these quebradas contained running water all year round in living memory, and that Chontaleños today describe fishing in the quebradas rather than the Mayales River, even though they can no longer support fish communities for part of the year, I am now considering the possibility that the ecological conditions I described above reflect quebradas next to the archaeological sites in question, rather than the closest reach of the Mayales River itself.

Procurement and transportation: Garden hunting and landscape management

The ubiquity of white-tailed deer (*Odocoileus virginianus*) within the Mayales River Valley assemblages is not surprising given that it is one of the largest animals in the region and is diurnal, making it relatively easier to hunt. It tends to occupy low brush, thickets, and savanna and thrives in ecological zones that have been disturbed by humans (Mendéz 1970). Therefore, less effort is required to obtain this species than, for example, species not present in the assemblage, such as Baird's tapir (*Tapirus bairdii*), or even the slightly smaller Central American red brocket deer (*Mazama americana*), both of which preferentially occupy dense forests, are solitary, and are mostly nocturnal. The white-lipped peccary (*Tayassu pecari*) is also notably absent from the Mayales River Valley assemblage; it also preferentially inhabits dense forests and, unlike the tapir and brocket deer, tends to move in such large herds that it can pose a danger to humans if provoked.

With the exception of the gray four-eyed opossum (*Philander opossum*), the preferential hunting and consumption of the other mammals in the assemblage—Central American agouti (*Dasyprocta punctata*), collared peccary (*Pecari tajacu*), and lowland paca (*Cuniculus paca*)—along with the white-tailed teer, were convincingly interpreted by Linares (1976) in her work in northern Panama as evidence of so-called "garden hunting" because these animals preferentially consume human-cultivated crops and can occupy disturbed ecosystems (Mendéz 1970; Sowls 1984). It seems reasonable to suggest that the occupants of the Mayales River Valley were similarly intentionally targeting species that could be hunted close to home, within agricultural fields and other cleared areas, rather than venturing deep into the forest to hunt on a regular basis.

The disproportionate number of late subadult white-tailed deer individuals in the assemblage and the occurrence of skeletal elements from the entire body, regardless of meat content, also fit Linares's (1976) garden hunting theory: if the Mayales River Valley occupants were hunting close to home, transportation would not be costly, and individuals in the herd could be targeted. However, these features of the assemblage may suggest even more sophisticated landscape management strategies and complex human-animal relationships.

Pohl (1983, 1990) suggested that the Maya either practiced deer penning, as has been suggested by ethnohistorical accounts (de Landa 1941; Puleston 1972), or that they engaged in strategic management of wild game. This assertion has since been supported by zooarchaeological studies in the region: Teeter and Chase (2004) and Masson and Peraza Lope (2008) interpreted a higher proportion of subadult white-tailed deer than expected at Caracol and Mayapán as evidence for either husbandry or selective hunting. Both studies argue that this

pattern is typical of husbanded flocks, where animals are slaughtered as soon as they attain maximum size but skeletal elements that fuse close to or after sexual maturity remain unfused.

While the aforementioned authors do not attempt to distinguish between domestication and landscape management in their work, I suggest here that landscape management rather than domestication is the most parsimonious explanation for the pattern in the Mayales River Valley, pending further investigation. First of all, no evidence for pathologies associated with penning were present among the white-tailed deer in this assemblage despite their commonality in penned artiodactyls from archaeological contexts (Köhler-Rollefson 1989; Meadow 1989). Additionally, penning white-tailed deer is notoriously difficult, even in modern zoo contexts, due to the amount of fodder required, pests and parasites, and the dangers that stags pose to does and to humans during the rutting season (Crandall 1964; Pohl 1990; Taylor 1956). Unfortunately, there has to date been no archaeological excavation of agricultural fields in the Mayales River Valley or paleoenvironmental investigation. However, paleoenvironmental studies from nearby Ometepe Island (Avnery et al. 2011) and the Asese peninsula (Harvey et al. 2019) are suggestive of intensifying burning during the same time that Period II sites in the Mayales River Valley were occupied, proposed by Avnery et al. (2011) to result from Indigenous landscape management for agricultural purposes. This would have resulted in the type of landscape described by Linares (1976) as ideal for garden hunting.

Therefore, it seems more likely, as was suggested by Pohl (1990) as a possibility for Mesoamerican contexts, that the inhabitants of the Mayales River Valley managed deer populations indirectly, by managing their environment. In the Petén region of Guatemala, for example, farmer-hunters burn savannas and *milpas*[31] to attract white-tailed deer, who initially use the ashes as a salt lick and then graze on nutritious young sprouts, followed by the immature corn. As the corn ripens, farmers construct platforms or sit in trees near their milpas when they aren't actively engaged in cultivation tasks, waiting for the deer to approach before shooting them (Gann 1918; Reina 1967; Pohl 1990).

It seems plausible that in such a context, where farmer-hunters are routinely encountering the same deer herds who return to their fields over time, they may also be familiar with the demographic makeup of the herd, thus making it possible to target certain age, size, and sex classes of animals. The same principle that applies in herd culling of domesticated animals—slaughtering some (male) animals just before or at sexual maturity—would also be advantageous in the management of a wild herd, as it would provide the maximum yield of tender meat, while not affecting the herd's future fertility. Additionally, the selective hunting of some young stags would likely prevent injuries to does and the remaining stags during rutting season.

The presence of skeletal elements from the entire animal and the demonstrated preference for individuals in late subadulthood at Roberto Amador and Sabana Grande suggests that from a technological perspective, occupants of both sites possessed a similar knowledge of white-tailed deer growth and behavior and can be considered a single community of practice in terms of hunting strategy. While garden hunting coupled with wild herd management seems a more plausible scenario than penning or incipient domestication at this point, future work should be designed to investigate both possibilities. This may involve paleoenvironmental analysis of sediment cores to investigate ecological effects of agricultural practices (i.e. whether burning can be confirmed, whether intentional or unintentional); stable isotope analysis of $\delta^{13}C$ and $\delta^{18}O$ from deer remains to investigate diet and seasonality (see Emery and Thornton 2008; Rivera-

[31] Traditional Mesoamerican agricultural field systems.

Araya and Birch 2018; Sugiyama et al. 2020); and continued discussions with contemporary residents of the Mayales River Valley about recent historical and current hunting practices.

Procurement and transportation: place-based knowledge

Analysis of faunal assemblages from mortuary contexts at La Pachona and Roberto Amador has demonstrated that occupants of the Mayales River Valley were also targeting the Central American red brocket deer (*Mazama americana*), a forest-dwelling species, but only for specific occasions and functions, not as part of the typical diet. Indeed, this species was not present in any other analyzed context. Unlike the white-tailed deer element representation described above, this species was primarily represented by cranial elements. At the site of La Pachona, for example, I identified horn cores representing a minimum number of three individuals associated with a single vessel burial.

Shortly after I first excavated this assemblage of horn cores, PACEN project members and I were walking through the nearby Amerrisque Mountains with Don Teyo, a lifelong Chontaleño. He pointed to a pocket of dense forest in an otherwise open landscape of rolling hills and said that until twenty years ago, when it was outlawed, he used to come out to the mountains at dusk and hunt brocket deer by night (Eleucterio Castillo 2015, personal communication). This was not subsistence hunting, as Teyo and most other Chontaleños are today cattle ranchers and have access to plenty of domesticated animals.

That same day, Don Teyo also led the PACEN survey team to a petroglyph, one of only two recorded in this mountain chain, depicting a brocket deer, with its short antlers and stubby tail (Figure 12). Clearly, Indigenous people living long ago developed longstanding relationships with this particular animal, in this particular *cordillera*, and transmitted aspects of this embodied, place-based knowledge through to the present. Notwithstanding the great difficulty of procurement and small caloric reward, this hunting practice endured. Perhaps the conspicuous association of brocket deer crania with human interments signified difficulty itself, a display of effort on the part of the living community in honor of the dead. The tropical gar and bull shark remains described earlier, also from the same mortuary context, may also index a different type of effort associated with commemorating the transition to ancestor from the world of the living. As described, these species are not present elsewhere in the Mayales River Valley assemblage, and no other species were identified that imply fishing or hunting in Lake Cocibolca itself, rather than the Mayales River and its tributaries. These archaeological interpretations, co-produced with Don Teyo and other Chontaleños, shed light on past conceptions of these species, as well as the knowledge required to come into relation with them.

Figure 12. Brocket deer petroglyph in the Amerrisque Cordillera.

Butchery as a learned practice

Bone marrow extraction has been interpreted as an indicator of resource scarcity, requiring the need for additional caloric intake (see Broughton 1999; Nagaoka 2005; Munro and Bar-Oz 2005; Potter 1995). This interpretation is possible in the Mayales River Valley, but other indicators of resource scarcity like increased reliance on small animals are not present in this assemblage. Rather, this new butchery tradition associated with Period IV is more likely related to the adoption of new forms of technology. This linkage makes sense given that longitudinally splitting a bone puts considerable stress on a stone tool, which has a shorter use-life, dulls more quickly, is more difficult to sharpen, and requires more energy to cut through bone or tissue (Walker 1978). Additionally, both chipped stone and ground stone axes are more likely to splinter the bone than metal, thereby introducing unwanted bone fragments into the marrow (Okaluk and Greenfield 2022).

Thus, it appears that Indigenous adoption of metal butchering technologies introduced by the Spanish resulted in the development of a new operational sequence characteristic of bone marrow extraction. While the practice of marrow extraction has been described elsewhere in pre-Hispanic Central America and may have predated metal technologies in the Mayales River Valley (see Martínez Polanco et al. 2021), the adoption of metal technologies in this area would have made it much less costly and more commonplace. Interestingly, this operational sequence carried out with metal tools co-occurs in stratigraphic units at Sebastián Ríos Histórico alongside

zooarchaeological evidence of stone tool butchery and chipped stone artifacts, representing the continuation of Indigenous traditions of lithic production and use (Donner 2020).

Consumption and disposal: Colonization and persistence of Indigenous foodways

The shift between Period II and Period IV from unweathered bones that were calcined after disposal to bones that were carbonized by roasting is supported by ceramic evidence as well. The ceramic assemblage from Period IV is characterized by carbonization from use-alteration, soot deposits on external walls, and encrustation of charred remains on internal vessel walls (Donner 2020). Meat cooked in a vessel exhibiting these signatures would be expected to bear the traces of partial carbonization that are indeed present in the faunal assemblage. Additionally, ceramic colanders, ubiquitous in Period II sites and used for steam boiling, are not present in the Period IV assemblage, perhaps suggestive of a declining preference for this method of food preparation. Ceramic evidence also indicates another shift in culinary practices during this time period that may have accompanied the newfound preference for roasted food: although *comales* were present in at least one site in the Mayales River Valley predating the Spanish invasion (Donner et al. 2019), they become common at Sebastián Ríos Histórico and La Aventura, suggesting the widespread consumption of flat breads at these sites (Donner 2020).

Although European domesticates were consumed throughout the occupation of Sebastián Ríos Histórico, and stratigraphic and radiocarbon analysis indicate that this occupation entirely postdated the Spanish invasion (Donner 2020), the significant quantity of Mesoamerican slider (*Trachemys* sp.) remains indicates the importance of this species to the inhabitants of Sebastián Ríos Histórico. This species is present within the Period II assemblages of Oporta, Roberto Amador, and Sabana Grande, and therefore its occurrence at Sebastián Ríos Histórico illustrates the persistence of Indigenous foodways, in spite of Spanish colonization. Indeed, turtles are still consumed in the region today, although in low quantities due to governmental restrictions, and the meat is considered a delicacy, especially when prepared in soups (Arteaga Saucedo 2017; Luis Gutiérrez 2016, personal communication). Interestingly, unlike the signatures of roasting present on the European domesticates, none of the turtle remains from this context bore signs of carbonization, suggesting continuity in not just species selection, but also Indigenous methods of food preparation associated with this species.

The occurrence at La Aventura of late subadult white-tailed deer (*Odocoileus virginianus*) remains (the same age profile as characterized the Period II sites of Roberto Amador and Sabana Grande) alongside cattle introduced by the Spanish, as well as the occurrence of calcination (which characterized Period II refuse burning), also suggest continuity with pre-Hispanic practices. These trends are interesting to consider in light of other observations about the site. Unlike Sebastián Ríos Histórico, La Aventura is a mounded site, superficially similar to many of the pre-Hispanic sites in the Mayales River Valley (Donner 2020). Contemporary place-based knowledge supports this observed continuity in practices of mound construction. More than 80% of the archaeological sites documented by PACEN are associated with surficial *tierra lanilla* (alluvial soil), according to local soil taxonomy—the same sediment type used both to construct archaeological mounded sites and the clay homes of Chontaleños today (Donner 2020; Eleucterio Castillo 2016, personal communication; van Dijk 2017). Archaeological excavations at the Period II site of Oporta yielded pieces of burnt clay with imprints of thin tree stems or trunks, suggestive of the wattle-and-daub method employed today, further supporting the persistence of construction practices that predate the Spanish invasion (Donner 2020). Additionally, no colonial-era ceramic sherds were visible on the surface at La Aventura, but

chipped stone and basalt columns were present, both suggestive of continuity with pre-Hispanic lifeways. However, radiocarbon dating (Donner and Geurds 2018) and ceramic technological analysis (Donner 2020), as well as the presence of European domesticates in the faunal assemblage from La Aventura, demonstrate that the site postdates the Spanish invasion.

Conclusions

When taken together, the changes in butchery, cooking, and refuse disposal practices between Period II and Period IV suggest that local Indigenous communities in the Chontales region maintained traditional foodways in the face of Spanish colonialism, while selectively integrating new human-animal relations into their practices. These resistances continue into the present day, as some community members continue to hunt and manufacture ceramics using traditional methods, despite political and economic pressure to abandon these practices in favor of a more urban, Westernized lifestyle (Donner 2020; Espora Producciones 2016).

These conclusions have implications for understandings of Indigenous history and identity. For example, by the end of the 17th century and through the beginning of the 18th, Indigenous groups within this area (the so-called *Chondales*) were said to have avoided lowland areas entirely to escape enslavement by the Spanish *encomenderos*,[32] and Indigenous persistence after this point in time is undocumented in the historical record due to known structural biases among census takers, who often did not record the so-called *indios bravos*[33] of the highlands (Gould 1998; Van Broekhoven 2002). It is interesting to note, for example, that the Amerrisque Cordillera, where Don Teyo continued to hunt the very same brocket deer depicted in the petroglyph that adorns this rocky landscape, is one highland area where *indios bravos* were known to reside. In the Mayales River Valley, the archaeological narrative and contemporary place-based knowledge together put forward a powerful counter-narrative, providing evidence for the continuity of Indigenous traditions of architectural construction, ceramic manufacture, and human-animal relationships, and their associated place-based knowledge, both during and after this period of flight into the highlands and continuing into the present day.

Future zooarchaeological work in the Chontales region of Nicaragua will continue to explore the persistence of Indigenous lifeways through to the present. For example, the uppermost stratigraphic units at most sites in the valley contained recent European cattle remains, consistent with the historic record that describes a shift to a cattle-ranching economy by the 19th century (Van Broekhoven 2002). This practice is both integral to contemporary identities within the area and also recognized by the local community to have caused watershed pollution, deforestation, and runaway erosion. Through radiocarbon dating and isotopic analysis of these remains, as well as isotopic analysis of the remains of native artiodactyls (e.g., white-tailed deer), I plan to investigate changes in feeding practices and animal movement patterns, to compare these with similar studies of precolonial game animals. This study aims to elucidate the particular development of cattle ranching in Chontales and its relationship to preexisting Indigenous practices of herd management, as well as the impact of both practices on the local ecology. It would contribute to the incipient body of research on the development of distinct

[32] Under the *encomienda* system, *encomenderos* were granted the right to extract slave labor from a specified number of Indigenous people in a particular region, which often involved forced displacement and relocation of entire communities and working conditions that resulted in early death (Reséndez 2016).

[33] Literally meaning "wild, brave, or warlike Indian," this term was used by the Spanish to refer to Indigenous communities that were seen to be resistant to Spanish enculturation (see Gould 1998).

Indigenous relationships with European domesticates, which may in fact represent Indigenous persistence rather than colonial enculturation (see, e.g., Campbell 2021; Taylor 2021).

This study would also investigate the role of place-based knowledge concerning the behavior and ecology of different animals, in this case, white-tailed deer (*Odocoileus virginianus*) and the domestic cow (*Bos taurus domesticus*). These animals are not just passive recipients of human decision making, but rather vital actors within the landscape that have their own ways of knowing and being in the world—their own *umwelten* (von Uexkull 1934). When we speak of communities of practice that involve animal remains, therefore, we must speak of multispecies communities in which animal actions have the potential to support or to conflict with those of their human cohabitants. According to Wenger-Trayner and Wenger-Trayner (2015), a "practice" is defined by the development by a community, whether intentionally or unintentionally, of a shared repertoire of resources. Organismal biologists, animal behaviorists and ecologists are increasingly recognizing that animals engage in practices of learning (see Pearce 2008). Therefore, when examining communities of human practice that involve animal relationships, we should also consider how animal practices come into play.

These ideas originated from close fieldwork collaborations with community members in Chontales. If faunal assemblages are considered to be archives of place-based knowledge that is learned and transmitted, reflecting the embodied experience of relating to animals, then contemporary place-based knowledge concerning these same animal relationships is not only appropriate but often essential for archaeological interpretation. As a zooarchaeologist committed to collaborative archaeology, I intend to continue exploring the ways in which the laboratory work of technical specialists can become more collaborative, to better investigate the role that animals and their remains play in human placemaking.

Chapter 6
Conclusions

This dissertation provides case studies illustrating different parts of the collaborative research cycle, from establishing partnerships and designing research aims, to survey and laboratory analysis. It centers around two key concepts that emerged from conducting archaeological work in two contexts in Lower Central America, the Chontales region of Nicaragua and the Darién Province of Panama: place-based knowledge and the politics of archaeology in relation to Indigenous sovereignty.

Place-based knowledge

First, place-based knowledge—relational ideas and practices that emerge and evolve through long-term human engagements with particular lands and waters—is an important feature of many Indigenous knowledge systems (see, e.g., Risling Baldy 2020; TallBear 2013) and has particular significance for archaeological interpretation, which is notably dependent on context (Wylie 2002). It also entails a relationship with archaeological sites that may require bespoke methodologies. If an archaeological site is also an important feature of the Indigenous landscape, then likely protecting it in place will be important. This may still involve excavation, but it will likely involve a change in how the site is conceptualized on the part of the archaeologist: not an accidental residue of past human activity but rather a place constructed by ancestors, often with knowledge explicitly or implicitly destined for future generations (see Chapter 1).

There is a notion among archaeologists that archaeological excavation is unavoidably destructive and that, therefore, we should mitigate that destruction through detailed recording in multiple forms of media and collection of copious samples beyond those we will analyze, to facilitate virtual reconstruction of the site and diverse collections research in the future.[34] However, if archaeological sites are considered as important nodes in landscapes of place-based knowledge, then the unconsidered removal of materials from these landscapes risks rendering the knowledge held in them incomplete at best. Therefore, archaeologists seeking to access the epistemic resources of place-based knowledge must design any survey or excavation that involves materials collection not only to conform to processes of archaeological knowledge production, but also, primarily, to harmonize with community processes of knowledge production.

Additionally, because place-based knowledge exists fundamentally in relation, community members need to be able to access their ancestral landscapes in order to enact, maintain, and transmit the knowledge they hold. Archaeologists working within a framework of place-based knowledge shared with them by Indigenous colleagues should therefore design their research to explicitly recognize Indigenous sovereignty, thereby correcting the intellectual-historical bias that predisposes standard archaeological accounts to undermine Indigenous Knowledge and Law (see next section; Martindale and Armstrong 2019). Archaeological knowledge co-produced conscientiously in this way can be effective in supporting Indigenous sovereignty with respect to colonial institutions that habitually erode that sovereignty,

[34] This idea apparently derives from Walter Taylor (1948), whose idiosyncratic view of the bounds of archaeological knowledge led him on the one hand to advocate where actually rather limited recording practices, but also to consider this approach essentially comprehensive documentation (Wylie 2002).

mismanage the places in which knowledge is held, and thereby endanger the future production of such knowledge. Indigenous sovereignty instead enables the proper stewardship of the place-based knowledge that forms the basis of future research and learning.

To further knowledge production in the future, we as archaeologists can be involved in both protecting sites in place and restoring the integrity of sites that have been disturbed, as many Indigenous communities argue that site integrity can be restored through practices such as recovering and reburying physical components of sites. As described by the United Auburn Indian Community's Tribal Historic Preservation Officer Matthew Moore (2022), "this view of integrity is often at odds with archaeological considerations which frequently mention 'disturbance' and lack of in situ soils…[but] by restoring the integrity of these places, the integrity of the Tribe's culture is restored, as well as Tribal values and sovereignty." As I describe in Chapter 4, both intranational and international repatriations can be part of this process of restoring integrity, as can employing archaeological techniques to make Indigenous political history legible for settler colonial systems that struggle with nontextual historical evidence (in, for example, land claims).

Indigenous sovereignty and the politics of archaeology

Participating in this process of restoring integrity necessitates a detailed understanding of the local and national political and legal contexts in which one is working, as well as, in the case of collaborations with Indigenous communities, knowledgeable respect for the specificities of Indigenous sovereignty in that context. The second key concept unpacked in this dissertation is the importance of this political context for a collaborative archaeological practice, in terms of both ethics and epistemics. As described above by the United Auburn Indian Community's Tribal Historic Preservation Department, there is a clear link between Tribal sovereignty and restoring relationships between cultural sites, Tribal citizens, and the landscape. However, although many nation-states have begun to accept and even, in some cases, applaud Indigenous identity as manifested through certain "cultural" practices (e.g., dress, language, music, ceremony), they generally fail to recognize distinct Indigenous systems of law and governance (see Chapter 3).

For example, in the Minister of Culture's response to the community of Mogue in regards to the recognition of the provenience of the stela held in storage at the Museo Antropológico Reina Torres de Araúz (see Chapter 4), she was willing to acknowledge that the statue was in fact from Mogue and that it continues to hold cultural and historical value to the community (González Villarrué 2023). She even describes that the archaeological report we submitted with the community (Donner, Gill, and Mendizábal 2023) "manifiesta el compromiso del pueblo y la dirigencia de Mogue en cuidar y custodiar su patrimonio arqueológico."[35] However, she also makes clear that this community stewardship is limited and subordinate to national interests, as "todo objecto arqueológico es un bien de dominio estatal."[36]

I have come to realize that as a foreign archaeologist working with an Indigenous community in Panama, this position held by the Ministry of Culture has limited my ability to conduct collaborative work in a way that truly supports Indigenous sovereignty by fully recognizing Mogue's traditional system of governance. To conduct any archaeological work, I

[35] "Expresses the commitment of the people and the leadership of Mogue to care for and steward their archaeological heritage."
[36] "Any archaeological object is a property under state domain."

need a permit from the Dirección Nacional de Patrimonio Cultural, under the auspices of the Ministry of Culture. The permitting process necessitates submission of a complete research proposal, including background research, research objectives, field methods, and laboratory methods. Of course, granting agencies also typically require similar information in their applications. Usually, the permit request is submitted in advance of arrival in Panama, both because many granting agencies require already having a permit to fund the research and because the timeline for approval can vary. What this has meant in my experience, both as applicant, participant, and reviewer, is that grant proposals and permits are drafted well before traveling to the community. While we can consult with individual community members who have Internet access during this process, we cannot engage with Mogue's system of governance, which involves a collective assembly that necessitates being physically present in the community.

When we arrived in Mogue in July of 2022, before commencing any archaeological work, we did participate in an official Congreso Local, attended by hundreds of community members, who all had the opportunity to ask questions about, critique, and make suggestions for the direction that the archaeological work should take. All community concerns had to be addressed, and a consensus reached, before the leadership drafted and signed a formal resolution with us that dictated the terms of our collaborative work. However, we arrived in the community in boats provided by the national Ministry of the Environment, deemed by the national government to be necessary due to perceived security risks in Darién Province, and with permits in hand from the Ministry of Culture. While the community certainly felt empowered to decline permission for any archaeological work to be carried out, we entered as, in a sense, delegates of the national government. We sought approval from the national political apparatus prior to the local, Indigenous political apparatus, and I wonder to what extent this has limited the creativity and effectiveness of our collaboration.

In his book *Archaeology as Political Action*, Randall McGuire (2008) provides a cautionary tale for what can happen when Indigenous sovereignty is not recognized and national politics are not adequately taken into account in the course of conducting archaeological research. In 1995, he co-directed an archaeological project in Sonora, Mexico, with Elisa Villalpondo (Centro Instituto Nacional de Antropología e Historia [INAH] de Sonora), on the ancestral lands of the Tohono O'odham Nation. Although Tohono O'odham Nation is today based in Arizona, their ancestral lands include land in northern Sonora, and many Tohono O'odham people continue to live on the Mexican side of their territory. Neither the local Tohono O'odham people nor the Tohono O'odham Nation were involved as collaborators in the research design, but the Cultural Affairs Committee of Tohono O'odham Nation was sent a grant proposal describing the project, already approved by both national and regional INAH offices. A meeting was arranged prior to the excavation, at which time it was agreed that if burials were encountered, (1) they should be excavated to prevent looting and (2) the Cultural Affairs Committee should be contacted. Two inhumations were discovered within the first few weeks of excavation, and the project directors contacted the Cultural Affairs Committee. At this time, the Tohono O'odham Nation permitted nondestructive analysis, with the agreement that the ancestors would be reburied locally in Sonora following these analyses. In total, the project excavated ten burials containing twelve inhumations. However, when the Centro INAH de Sonora (the regional office co-directing the excavations) sought permission from the national governing council of INAH for reburial, this request was denied, with the implication that reburial would constitute American meddling in Mexican affairs. These twelve Tohono O'odham

ancestors are likely still held in a museum somewhere in Mexico. McGuire (2008: 185) relates that "the Tohono O'odham felt betrayed by the turn of events."

McGuire (2008: 185) attributes this "lack of success" to "our failure to establish a long-term and involved collaborative relationship with the Tohono O'odham as a community[,…]our failure to understand the shifting context of Mexican nationalism and the place of archaeology in it[,…]and the compelling realities of the border." These are all likely contributing factors, but addressing these issues would not prevent such a course of events. Rather, the true cause of this exhumation of ancestors and failure to repatriate them is a lack of recognition of Indigenous sovereignty. This is evident from McGuire's (2008: 185) discussion of what the project should have done: "In retrospect, we should have included the Consejo de Arqueología [INAH's national governing council] in our consultations with the Tohono O'odham from the beginning." That is, McGuire believes the project should have been more proactive in its recognition of national INAH's sovereign rights but does not consider the possibility that consultation with the Tohono O'odham Nation should perhaps also have been initiated earlier—before project permitting, for example. By first seeking permission from the Mexican national government rather than the Tohono O'odham Nation, McGuire's revised course of action would still explicitly affirm the sovereignty of Mexico—considered an "invader" by the Tohono O'odham (McGuire 2008: 184)—and implicitly deny the sovereignty of the Tohono O'odham over their ancestral lands. Additionally, while McGuire (2008: 181-2) provides a detailed account of Mexican heritage law, he includes no discussion of Tohono O'odham Law or traditional governance, aside from a brief mention that after NAGPRA was passed, "[a]ll of the Native American nations and communities of southern Arizona established either a committee or a designated individual within their governmental structure to handle this [archaeological] consultation" (2008: 182). Despite himself being a citizen of the United States, which recognizes the Tohono O'odham Nation as a sovereign nation with inherent rights of self-government, McGuire does not engage with this political institution in the same manner as the Mexican government.

This account is not meant to single out McGuire, but rather to illustrate the pervasive lack of understanding of Indigenous sovereignty within archaeological practice, even by one of the most respected scholars of both collaborative archaeology and the politics of archaeology. As discussed throughout this dissertation, without an explicit recognition of Indigenous sovereignty, archaeologists can inadvertently lend support to colonial institutions and undermine Indigenous sovereignty because the disciplinary histories of archaeology and settler-colonial law are linked (Joyce 2021; Martindale and Armstrong 2019). This has dire consequences for Indigenous communities we work with (see Chapter 3) and, as I argue, inhibits the potential ethical and epistemic benefits of collaborative archaeology from being realized.

From collaborative to community archaeology

I'm not sure that I would have recognized these limitations if not for the onset of the COVID-19 pandemic in March of 2020 and ensuing shelter in place. Because of the limitations on travel, I spent an entire calendar year in the Bay Area for the first time since I moved here in 2016. As a result, I became more active in my community, which at the time was the City of Richmond. In July of 2020, I attended a City Council meeting, where I heard about a proposed real estate development at Point Molate, on the shore of the San Francisco Bay. I knew that there were multiple shellmounds in the area and saw that the Confederated Villages of Lisjan Nation, on whose land I was living, had recently asked to consult on the project, although the

Environmental Impact Assessment had been completed before Tribal consultations were legally mandated and therefore did not incorporate Lisjan perspectives. After reading the Tribe's statements about the project, I reached out to Tribal Chair Corrina Gould, asking whether the Lisjan had an interest in noninvasive archaeological techniques that might be used to identify shellmound sites, which they knew were present but the cultural resources survey had failed to identify.

We began working on that project together, which soon led to providing other archaeological consultation and then to synthesizing archaeological evidence for interpretation in a legal setting (Lightfoot, Gill, and Brown 2021). Importantly, the Tribe chooses in each individual case whether or not to invite us into the consultation. While collaborative archaeologists have written about the importance of communities being able to veto aspects of a project at any point (see Chirikure and Pwiti 2008), that entails wasted labor from all parties involved, including the community, and should only be seen as a last resort. By choosing to invite us (or not) for each meeting, the Tribe is exercising its sovereignty, demonstrating that we are engaged through the political structure of the Tribe, the only governing body with the authority to engage in consultation with city, state, and federal governments. Since then, we have outlined the foundations of and begun an extensive collaborative research project aimed at reinterpreting shellmound and other ancestral sites from a Lisjan perspective, calibrated to the landscape of cultural heritage law in California.

Even from this brief description, it should be clear that my work with the Confederated Villages of Lisjan and Darién Profundo had different beginnings. The former began with communication through the proper channels of Indigenous governance, recognizing Lisjan sovereignty, while the latter began with conversations with other researchers who had worked with Indigenous communities in the area (who knew that these communities were interested in archaeological research in the interest of land rights) and permitting requests to the national government. The former began without a clear research agenda, which has only emerged after years of discussion and collaboration with the Tribe, while the latter began with an outlined research program, adapted based on community goals and concerns but originally premised upon trends in regional archaeological (rather than community) scholarship.

Additionally, the former arose from a context that, as a resident of Richmond (and United States citizen), I also had a stake in. Because I lived in the community, I could conduct fieldwork quickly, without initial grant funding, and I could flexibly attend community meetings about this issue, which continued periodically for over a year. Darién, by contrast, requires significant funding for travel and logistical support from the national government, making one beholden to both granting agencies and the national government before the local community. The extensive travel required also means that I cannot attend community meetings in the province regularly and therefore am less apprised of current events that may impact my archaeological work or how its results may be employed. I do intend to continue my work in Panama in some capacity, but these experiences have made me reflect on the different relationships I can have to a place that I travel to rather than live in, where governmental structures are different. There are additional responsibilities one must take on as a foreign researcher carrying out work with Indigenous communities in settler-colonial contexts, where distinct Indigenous systems of governance are constantly threatened by legal colonialism.

Future directions: Indigenous heritage in settler courts

As described throughout this text, archaeology has contributed to this legal colonialism, as it is often employed by settler-colonial nation-states to challenge the evidentiary significance of Indigenous oral histories in court (Miller 2011; Martindale 2014; Martindale and Armstrong 2019). While working with the Confederated Villages of Lisjan on the legal case of *Ruegg & Ellsworth v. City of Berkeley*, involving the West Berkeley Shellmound, I realized that while mandated environmental review processes and historic preservation statutes represent the primary legal checks on the destruction of Indigenous cultural heritage, state conceptions of environmental protection and historic preservation are often at odds with Indigenous Law. Additionally, lawyers and the judiciary are often not practiced in interpretation of archaeological evidence or evaluation of its biases, and archaeologists are often unfamiliar with the norms of the settler-colonial legal system they are working within, producing research that may not meet evidentiary standards of courts of law (Hogg and Welch 2020).

However, collaborative archaeological research can also provide an opportunity for introducing ideas from Indigenous Law into settler-colonial legal systems, representing a step toward a more just legal framework for Indigenous cultural heritage and land law in settler-colonial contexts. My ongoing research investigates the role that archaeological evidence has played in legal cases involving Indigenous communities and designs collaborative archaeological research to challenge settler-colonial misunderstandings of Indigenous cultural heritage that have become codified in law. Through this work, I hope to continue to earn the privilege of engaging with place-based knowledge and the sacred places in which it is held by conducting research in good relation to community and place, contributing to Indigenous-led efforts for stewardship and sovereignty.

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