Distribution, Use and Cultural Meanings of Ciprés de Las Guaitecas in the Vicinity of Caleta Tortel, Chile

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This study examined the changing roles of ciprés de las Guaitecas (*Pilgerodendron uviferum*) in the lives and livelihoods of Tortel community members. A political ecology framework built on concepts of power, scale and social construction was used to problematize the availability of the tree as a resource by revealing the multiple, contrasting perspectives of different socio-political actors. National and international policy documents were analyzed in order to uncover the discourses that drive decision-making at those scales. Participant observation and semi-structured interviews were conducted to explore local people’s knowledge, perceptions and opinions regarding the difficulties they face in accessing and utilizing ciprés, as well as the significance of the tree species to their lives/livelihoods. Ultimately, an examination of people’s relationships to ciprés and their interests in the continuation of those relationships speaks to whether and how ciprés can or should remain an important part of their lives/livelihoods.
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CHAPTER 1: INTRODUCTION

Ciprés de las Guai tecas (Pilgerodendron uviferum) is an endemic tree to the Southern Cone of South America, whose important ecological roles and high resource value have made it a species of global and national concern. This southernmost conifer has its greatest extent and abundance in southern Chile, where it most often occurs in small, isolated stands throughout its range (39°36’S to 54°20’S). Locally, the tree is prevalent in moist lowland areas such as stream corridors, coastal regions and flat, poorly-drained sites (e.g., Sphagnum bogs) (Wilcox 1996, Allnutt et al. 2003). Given its straight trunk, durability and resistance to decay, P. uviferum (hereafter ‘ciprés’) is ideal for use in construction (e.g., boards and beams, poles, shingles, furniture and boats). As a result of these high-demand characteristics and consequent value both commercially and for subsistence purposes, ciprés has been locally overharvested (Allnutt et al. 2003, Global Trees Campaign 2008). In addition, historic national land-clearing policies implemented in the early 1900s to foster colonization and extend agricultural land led to landscape-scale burning that contributed to the elimination of ciprés across the southern portion of its range (Global Trees Campaign 2008). The species’ current status is also a result of its reproductive ecology, which suggests that natural and artificial regeneration may be limited under normal conditions (Allnutt et al. 2003, Paul Alaback pers comm.) and further hindered habitat degradation due to fire-setting and livestock grazing that continues today (Global Trees Campaign 2008). Through his dissertation research, A. Holz (2009) found a scarcity of post-fire ciprés regeneration following the 1970s that is likely linked to a lack of seedling establishment due to the cumulative effects of fire on the mortality of adult seed trees. The alleged overharvesting of the species and the vulnerability of ciprés to continued decline has resulted in its inclusion in Appendix I of the Convention on International Trade in Endangered Species.
(CITES) (Global Trees Campaign 2008), and the species is classified as Vulnerable according to Red List criteria generated by the International Union for Conservation of Nature (IUCN) (Allnutt 2003).

Though human activities have had negative effects on ciprés populations, it is also true that human livelihoods have benefited from and become dependent upon the use of the tree species. Such is the case for the people of Caleta Tortel. Tortel (population 500), located near the mouth of the Baker River in Chile’s XI Region (Figure 1), was established in the mid 1950s as a base from which to harvest standing dead ciprés, and the town subsequently developed around the use of that resource. In fact, ciprés harvest became an integral part of most people’s lives and the economic mainstay of most livelihoods. The resulting interconnections between the tree species and the community are perhaps best exemplified by the ciprés pasarellas, or wooden walkways, on which the town is built and for which it was awarded a zona típica, or cultural heritage status by the National Monument Council in 2001 (Becerra 2008).

Today, household-scale harvest, use and sale of raw ciprés logs cut from dead trees continue to be important aspects of people’s lives and livelihoods. However, the availability of the tree species for local consumption is now complicated by a number of factors. While there are fewer individual ciprés trees, the harvest/use of these individuals has recently become the subject of contrasting national policies. On the one hand, Tortel’s National Monument status appears to encourage local consumption of ciprés by linking its use in the construction of town infrastructure and personal dwellings to the maintenance of the town’s unique history and culture. On the other, forest management policies that have become increasingly enforced in the Tortel area limit people’s access to the tree species. Thus, Tortel residents are currently anxious
The aim of this project was to explore the role that ciprés has played, does play and can continue to play in the lives of Tortel’s community members. This topic is especially crucial given that the town faces increasing pressures of external and local development, including the proposed construction of multiple hydropower facilities (Sin Represas 2011) as well as expanding tourism, which may place increased demands on ciprés and its associated habitat. The current status of ciprés, as well as any potential for the future sustainable management of the tree and uncertain about whether (or for how long) they will be able to (or should) continue to try to support themselves by harvesting the tree (Laura Becerra pers comm.).

Figure 1. Location of Caleta Tortel in relation to the capital of Region XI, Chile. Chile’s administrative regions are as follows: Tarapacá (I), Antofagasta (II), Atacama (III), Coquimbo (IV), Valparaíso (V), O’Higgins (VI), Maule (VII), Biobío (VIII), Araucanía (IX), Los Lagos (X), Aysén (XI), Magallanes and Antártica Chilena (XII), Los Ríos (XIV), Arica y Parinacota (XV), and Metropolitana de Santiago (RM).
species, must be understood in terms of the historic and current political, economic, social and cultural factors that ultimately impact the ecological structure and function of ciprés habitats. These factors include not only encroaching development, but the multi-scalar policies and perspectives of ciprés that guide its use. That current international and national conservation and management measures need to be re-examined is suggested by the following: 1) Historic human impacts on ciprés have not been rigorously quantified (Allnutt et al. 2003), nor has the practice of ciprés harvest been subject to empirical research; 2) The existing resource base of live and dead trees is not adequately quantified (Brian Reid pers. comm.); 3) The factors that limit the establishment and growth of ciprés, both biotic (interaction with other plant species) and abiotic (soils, hydrology, land use) are poorly known (Allnutt et al. 2003); and 4) Despite national forest policy, which requires the use of management plans and has restricted the logging of live trees, harvest of ciprés continues at local but cumulatively widespread scales.

This study seeks to support the potential for locally-appropriate ciprés management and use by examining some of the biophysical and socio-political aspects of ciprés harvest that are of direct importance to Tortel community members. In accordance, the following research objectives were pursued:

- Assess the current ciprés resource with a focus on the distribution, abundance and quality of the standing dead crop of ciprés.
- Understand the significance that the practice of ciprés harvest has had and continues to have for the community of Tortel.
- Identify and investigate barriers that inhibit the harvest and sale of standing dead ciprés and how they might be overcome.
- Determine whether international and national conceptions of ciprés differ from those at the local scale.
How these objectives were accomplished is the subject of the rest of this thesis. Chapters two and three set the stage of the investigation. In chapter two, I draw on the literature regarding land management in Chile to establish the historical and political context for my examination of ciprés management and use in Tortel. I also describe the geography of the Tortel area and the major events that led to the colonization of the area and the founding of Tortel proper. In chapter three I establish a political ecology lens based on notions of power, scale and social construction. I use this lens to problematize resource use in Tortel.

Chapter four describes how I conducted my fieldwork and what I did with the resulting data. In this chapter I develop methods for examining how the availability of ciprés for use by Tortel community members is produced by both struggles to access and use the material resource and struggles over the meaning of ciprés. I describe the ‘normative philosophical commitments’ (see Patterson and Williams 2005) guiding this research, including my rationale for using a case study approach that calls for the inclusion of local perspectives and knowledge. I also lay out the individual methods of data collection: ground-truthing of ciprés harvest sites, participant observation and semi-structured interviews with Tortel community members, and the gathering of archival documents. Then I describe how I used content analysis to get at the perspectives and knowledge of local people, and discourse analysis to reveal the conceptions of ciprés underlying policy texts.

In chapters five and six I discuss the results of my research. Chapter five is divided into sections based on the context of the material investigated and synthesized. In the Biophysical Context section, I report my observations of ciprés harvest sites, describe the local/practical ecological knowledge shared with me by research participants, and then develop a qualitative assessment of the ciprés resource based on these two sources of information. In the Livelihood
Context section I explore the major themes pertaining to the roles of ciprés in people’s lives/livelihoods that emerged from participant observation and semi-structured interviews. In the Conservation and Management Context section I examine the conceptions of ciprés that drive various policy scales and discuss the implications for the management/use of ciprés at the local scale.

In chapter six I draw together the distinct elements of the thesis. I integrate my theoretical understanding of scale with my applied understanding of ciprés harvest in Tortel in order to generate a theoretical model of this system of resource management/use. Finally, I argue that local conditions need to be re-evaluated and local perspectives and knowledge given voice if ciprés is to remain a material resource and important source of socio-cultural value to the people of Tortel.
CHAPTER 2: BACKGROUND & HISTORICAL PRECEDENTS

Despite the relative isolation of the Tortel area from the rest of Chile, settlement of the Baker, Bravo and Pascua river valleys – which are perhaps the most defining landscape features of the area – and subsequent patterns of natural resource use have been strongly affected by historic practices and national policies that originated elsewhere. Policies pertaining to land acquisition and use, particularly native forest harvest and conversion, are especially relevant to understanding the role of ciprés in lives and livelihoods in Tortel today. I will begin the chapter with an overview of Chile’s forests, which will lead into a discussion of the history of forest use and management in the country. This section will establish the national and international context in which ciprés harvest in Tortel will later be problematized. Finally, I will discuss the key processes that instigated colonization of the Tortel area and local residents’ harvest of ciprés for household use, trade and cash income.

Chile’s Native Forests

Chile spans 17°30’S to 56°30’S, encompassing a wealth of different bioregions (Wilcox 1996, Neira et al. 2002) from the Atacama Desert in the north to the Magellanic moorlands in the south. Between these extremes lie the temperate forests (35°S to 55°S, Neira et al. 2002) that have contributed so significantly to the development of the country: the creation and growth of local infrastructure to participation in the global economy (Clapp 1998, Durán 2006). This section will present an overview of Chile’s forests, and will also serve as an introduction to the geography of the country. Rather than comprehensive coverage of Chilean forest ecology, the goal is to provide the reader with an appreciation for how ciprés stands in the Tortel area fit into the larger context of land cover, especially forest composition and distribution, across Chile.
Chile is 4300 km long by an average of 160 km wide with a total surface area of about 775,000 km$^2$ including its islands. Given such a long, narrow form, the country has been divided into 15 regions in order to facilitate administration by the Republic (refer to Figure 1) (Neira et al. 2002). The bulk of Chile’s population is located in urban areas (about 88%), most of which are concentrated in the central regions. The Metropolitan Region that encompasses the capital of Santiago is home to approximately 6 million people (CIA 2010, Wikipedia 2010). In contrast, Tortel is located in Region XI or the Aysén Region, which is the third largest region by area (about 108,500 km$^2$) and yet the least populated (approximately 91,500 people) (Wikipedia 2010).

Chile’s physical geography is impressive. In the north, flamingos feed upon salt flats wrung by volcanoes in the world’s most arid desert. The coastal and Andean mountain ranges line the vineyards, orchards and agricultural fields of the Central Valley. In the cool, wet south, Chile’s coastline crumbles into more than 1600 km of fjords, and one of the largest stores of fresh water on the planet is composed by the following unique features: the Northern and Southern Patagonian Ice Fields, Lakes General Carrera and O’Higgins, and the Baker, Pascua and Bravo Rivers. The effects of the above land forms and climatic zones on the distribution and character of Chile’s human and non-human populations continue to be significant. This is especially evident when examining the country’s forests. Isolated by the Atacama Desert and the Andes Mountains, and shaped by the processes of glacial expansion and retreat during the Pleistocene, Chile’s forests are characterized by high heterogeneity and endemism, which have made them sites of national and global conservation priority (Wilcox 1996, Hughes 2002, Neira et al. 2002).
Indeed, Chile contains about one third of the world’s remaining large tracts of relatively undisturbed temperate forests (Neira et al. 2002), and arguably those that are the least protected (Wilcox 1996). While ecologists have described 33 different kinds of forest ecosystems (within 83 distinct floristic formations), foresters have reduced the classification of Chile’s forests into the following 12 types for management purposes: sclerophyllous, Chilean palm (Jubae chilensis), roble-hualo (Nothofagus obliqua and N. glauca), cordilleran cypress (Austrocedrus chilensis), roble-rauli-coigue (N. obliqua, N. alpina, and N. dombeyi), lenga (N. pumilio), araucaria (Araucaria araucana), coigue-rauli-tepa (N. dombeyi, N. alpina, and Laureliopsis phillippiana), siempreverde (“forever green”), alerce (Fitzroya cupressoides), ciprés de las Guaitecas, and Magellanic coigue (N. betuloides) (Wilcox 1996). See Wilcox 1996 and Neira et al. 2002 for specific details regarding the distribution and composition each forest type. I will limit my discussion of Chile’s forests to generalities and highlights drawn from the work of the above authors.

The temperate forests begin at about 30°S (in Region IV) of central Chile, where the Mediterranean climate of the central valley supports sclerophyllous forests dominated by thorny trees with water-conserving leaves; these forests are also found in the two mountain ranges (Wilcox 1996, Neira et al. 2002). As one progresses south, deciduous southern beech forests (Nothofagus spp.) that are adapted to greater moisture and temperatures that can drop below freezing at higher altitudes begin to characterize the coastal and Andean mountains. These forests contain an increasing mixture of evergreen species as the climate becomes even more cool and wet with distance from the equator. One such species is the araucaria, or monkey-puzzle tree, which is considered by botanists to represent an archetypal or prehistoric tree. Araucaria are also a sacred tree of indigenous communities whose social customs and livelihoods
have centered on the harvest and consumption of the trees’ seeds. Given long-standing exploitation for their high-quality lumber, Araucaria forests are currently limited to two distinct regions at high elevations, one in the coastal mountains above 1000 m (37 to 38°S) and one in the Andes above 900m (37 to 40°S) (Wilcox 1996).

Chile’s temperate rainforests begin in the mountains in the southern latitudes of Region IX (Wilcox 1996, Neira et al. 2002). In fact, the world’s greatest extent of coastal temperate rainforests, next to those of the Pacific Northwest, stretches from south-central Chile through the country’s southern reaches. Like other temperate rainforests of the Southern Hemisphere, most of the dominant tree species are broadleaf evergreens as opposed to conifers. There are three regions of temperate rainforest in Chile: the Valdivian, North Patagonian and Magellanic Rainforests (Wilcox 1996).

The Valdivian Rainforest, which begins at about 38°S in the Coast Range and 40°S in the Andes, is characterized by annual rainfall of 2.5m near sea level to more than 5m at higher elevations. In general, the lowlands are dominated by broadleaf evergreens; however, lenga, araucaria and especially alerce can be found at elevations greater than 500m. Alerce forests are one of the major components of the Valdivian Rainforest, and comprise some of the highest concentrations of biomass of any ecosystem in the world. Indeed, over a lifetime of more than 3000 years, a single alerce can grow to more than 4.5m in diameter. For this reason, this species of cypress is referred to as “the redwood of the South”. Like the araucaria, the alerce has long been exploited for its valuable timber, and the lowland habitats that it once favored were cleared to make way for agriculture and settlements. As a result, the alerce’s current range is discontinuous and limited to higher elevations: 40° to 44°S in the Andes, 39° to 42.5°S in the coastal mountains and on the island of Chiloé. Siempreverde is the other core component, as
well as the most extensive forest type in both the Valdivian and North Patagonian Rainforests. These are the most diverse of Chile’s forests; they consist of a complex mixture of different forest communities that are often composed by four or five layers of vegetation and a variety of broadleaf evergreen dominants that change with local conditions (Wilcox 1996).

The North Patagonian Rainforest begins to merge with the Valdivian Rainforest south of 43°S. It is characterized by a cooler climate, diminished average annual rainfall, and less biodiversity (Wilcox 1996). Tortel is located within this rainforest zone. The Magellanic Rainforest is composed by even fewer plant species, which is notable south of 48°S. The three evergreen southern beech species are dominants of the North Patagonian Rainforest, as are several other broadleaf evergreens, including tineo (*Weinmannia trichosperma*), canelo (*Drimys winteri*) and mañío (*Podocarpus spp.*). However, only Magellanic coihue is a dominant in the lowland forests of the Magellanic Rainforest, while the deciduous lenga is found in the uplands where there is more snow and less rain (Wilcox 1996). Forming a mosaic with the southernmost forests are the bogs that comprise the Magellanic moorland. They are most prevalent in the fjords from 43°S to the tip of the continent, but can also be found in several regions of the coastal and Andean mountains from 38°S or 40°S, respectively, through the Island of Chiloé (Arroyo *et al.* 2005). It is within these bog-forest complexes that ciprés occurs. Today, live ciprés is thought to be most abundant on the least accessible islands of the Chonos and Guaitecas Archipelagos, as well as those located south of the Taitao Penninsula. On the continent proper, isolated stands of ciprés remain on southern Chiloé (Jan Bannister *pers. comm.*), and in peat bogs or uplands along the Baker, Bravo and Pascua rivers.

Before concluding this discussion of Chile’s native forests, it is important to consider that the process of forest classification and the prevalence of each broad forest type today is a
reflection of the country’s history of forest management. This history has generated forest types by focusing attention on the tree species and forested areas of greatest value and easiest access to humans. Over time, exploitation has altered forest distribution and composition. For example, the roble-raulí-coihue forest classification is actually applied to second-growth forests that replaced the mature forests of the lowland valleys and foothills along the Andes in Regions VII to IX following clearing by Spanish colonists (Wilcox 1996, Durán 2006). In addition, the properties of a few of Chile’s specific tree species singled them out for human use since the arrival of the Spanish, if not before, thus resulting in severely restricted ranges (Armesto et al. 2001, Wilcox 1996). Today, these are the charismatic megaflora – alerce, araucaria, and ciprés – that inspire botanists and motivate conservationists, but whose roles in peoples’ livelihoods are now limited or prohibited. While it is outside the scope of this thesis to include a detailed account of how each of Chile’s forest types has been used and altered over time, it is important to note that these forest types are socio-political constructions that are not entirely based on science. What is most germane to the topic of ciprés harvest in the Tortel area are the historical trends in forest use that have resulted in current policies pertaining to the harvest and protection of the country’s forests, including those applied to individual tree species. These are the topics of the following section.

Chile’s History of Forest Management

In its simplified version, the history of forest use in Chile consists of cycles of colonization, fire, and land conversion. Beginning with the country’s earliest inhabitants, the use of fire has been practically a requirement for survival given the expanse of impenetrably-dense forests that have covered the central and south regions of the country (Durán 2006). Though indigenous peoples are known to have burned and harvested forests, the scale and
impact of land use changed dramatically with each successive wave of colonization: the arrival of the Spanish in the 16th century, European immigration in the mid 19th century, and finally domestic migrations during the 20th century (Wilcox 1996, Durán 2006, Holz 2009). Forests played different roles across these periods. For most of Chile’s history, native forests primarily served as the source of raw materials for the construction of national infrastructure and the operation of various industries, or they were cleared to make way for agriculture. Forests only became the focus of economic development and industrialization (i.e., a forestry sector was established) following the agricultural collapse of the 1930s, which was due to the unsustainable use of soil resources (Durán 2006). In general, land use in Chile has been driven by economic imperatives, with scant attention towards environmental impacts or even the notion of sustaining maximum yields (Wilcox 1996, Neira et al. 2002, Durán 2006). The first true environmental regulations and measures of forest protection were instituted following environmental crisis (Durán 2006) and an environmental consciousness that called for conservation of the country’s native forests did not arise until the 1990s (Clapp 1998). Drawing heavily on Durán’s (2006) history of landscape change in south-central Chile, I will discuss the ways in which Chile’s colonial legacy, assertions of national sovereignty and shifting economic directives have combined to yield the current status of the country’s forests and forestry sector.

During Chile’s years as a colony (roughly 1541 to 1818) the country’s south-central forests were established as a source of timber, firewood and artisanal crafts. Timber from these forests supported the development and operation of the colony’s shipyards, mines, smelters and tanneries. In addition, wood was exported as a raw material to Peru (a more-developed Spanish conquest), as well as wheat, hides, dried meat, wine, and copper. Under colonial rule, the first markets based on the harvest and sale of just a few prized tree species were created. Lumber and
value-added products constructed from alerce and ciprés were particularly valuable and contributed significantly to the economic development of southern Chile (Durán 2006). For example, dwellings and churches were made almost exclusively of alerce in the 16th and 17th centuries, and alerce shingles were exchanged as currency. Durán writes, “The importance of alerce on society and the economy of the south are reflected, even currently, on the existence of more than 50 terms related to this product and its exploitation” (p. 90, referring to Gunkel 1979). Actually, from the available documentation, it seems that the practice of harvesting alerce and the role of the species in local, national and international economies during colonial rule share many commonalities with the role of ciprés de las Guaitecas, but in the mid-twentieth century in the Aysén Region1.

Demands on native forests were generally low during the period of colonial rule. In fact, forest cover actually expanded, especially in the south, but the explanation is unfortunately linked to the disruption, displacement and/or destruction of indigenous communities and subsequent regeneration of forests on previously-tended fields and pastures (Wilcox 1996, Durán 2006). In contrast, widespread forest clearing characterized forest use following Chile’s independence from Spain. This was primarily due to the Republic’s strategies for asserting national sovereignty: augmenting connectivity and occupation throughout the country while establishing an export economy based on agriculture. Given the attendant need for settlers, workers and new technologies, legislation was passed in 1845 to bring European immigrants—particularly Germans due to their reputation as disciplined laborers—to Chile’s south-central

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1The available literature references the harvest and role of alerce during Chile’s early history more than that of ciprés, though both are members of the cedar family and share structural and chemical properties. This may be due to the relative utility of each tree species (i.e., a single alerce yielded a much greater quantity of wood than a single ciprés), as well as the distribution of the species relative to the location of population centers and ports (i.e., alerce was more widely-distributed and thus easier to access, whereas ciprés stands were limited to the island archipelagos and/or scattered, isolated patches).
provinces (Durán 2006). This first wave of State-sponsored colonization (roughly 1850-1875) initiated the pattern of linking land tenure to forest-clearing. Colonists were generally given tools, a team of oxen, and 150 to 500 hectares of land in isolated, forested regions, and were obligated to “clean” the terrain in order to raise crops and livestock (Durán 2006, p. 84). According to Durán (2006), Chile’s history includes five major phases of colonization across the south-central and southern regions of the country between 1850 and 1950. The wave of colonization specific to the Aysén Region will be discussed in a later section.

Widespread burning and selective-logging of forests accompanied the growth and development of nascent Chile. In part this was due to the increasing numbers of people and new settlements (including the foundation of 38 new cities between 1850 and 1910), which placed heavy demands on forest resources for timber and firewood. The construction of Chile’s public works, including telegraphs, roads and ports, but especially railroads (whose construction towards the south was initiated in 1862) was also extremely resource-intensive. For example, it is estimated that 1700 railroad ties were needed for each kilometer of track, with a total of 3300 kilometers between Santiago and Puerto Montt. During this period of growth, the “semi-precious” wood of alerce and ciprés (Duran 2006, p. 90) continued to be coveted. However, the demand for alerce locally, but also from northern Chile and Europe—around six thousand cubic meters annually in the early 1800s—in addition to careless land use practices resulted in the exhaustion of the most accessible coastal stands of the species by 1850 (Clapp 1998, Durán 2006). Meanwhile, ciprés was extracted from the Guaitecas Archipelago through the process of setting entire islands on fire, thus killing about ten trees for every standing dead trunk harvested. Much of this supply of ciprés was sent as railroad ties to Peru (Durán 2006).
The rampant destruction of forest resources, even including the burning of a 27,000-hectare lowland stand of alerce, was justified by the imperative to turn Chile into the “breadbasket of America” (Durán 2006, p. 88). Tens of thousands of forested hectares were incinerated in portions of Regions VII through X in order to open terrain for planting wheat and other cereals. Ironically, the “General regulation of the harvest of forests in the central zone” of 1873 is considered the first forest law of Chile (Durán 2006, p. 94). This regulation prohibited the use of fire, as well as the clearing of forests located in rivers, streams and springs, but was only applicable north of the Bió Bio River. Even where theoretically applicable, the regulation did not bear weight in practice because enforcement was left to the National Society of Agriculture whose goals were aligned with agricultural expansion. The uncontrolled clearing of forests was also supported by the government’s tendency to cede huge swaths of fiscal land (sometimes hundreds of thousands of hectares) to individuals or private entities, thus restricting the potential to regulate land use activities (Durán 2006).

Chile prospered between the end of the 1800s and the 1930s due in large part to the continual expansion of the agricultural frontier into forested regions, which created a successful wheat export industry. However, by the 1930s, the majority of the country’s key soil resources were either nutrient-deficient or eroding, and agriculture collapsed. Durán writes, “In close to 100 years since independence, Chile had destroyed a great part of its forest wealth, its agricultural soils and its rivers. The country was obligated to import great quantities of wheat, milk and meat” (p. 97). In response to this environmental crisis, the first piece of forest legislation with a conservation-oriented bent was passed in 1931; its goal was to limit forest destruction (Durán 2006). The Forest Law of 1931 (Decree 4,363) regulated logging and other forms of forest exploitation, prohibited the use of fire in specific areas, and created norms
pertaining to the formation of parks and reserves (Neira et al. 2002). However, as Neira et al. (2002) point out, the 1931 Forest Law lacked any preventative measures or incentives for driving the sustainable use of native forests.

Also in response to the degraded status of the country’s natural resources, as well as the effects of the economic crisis generated by World War I, Chile adopted a new economic strategy of ‘import substitutions’ at the beginning of the 1940s (Durán 2006, p. 97). This strategy included shifting the agricultural base to more northern regions (with the aid of irrigation and fertilizers), renewed burning in some areas of the south-central in order to “rehabilitate” degraded soils, and new attention towards the economic development of the country’s forest resources. For example, the first systematic mapping and evaluation of Chile’s forests was conducted in 1944 using aerial photographs. The 1940s also saw the founding of the first big lumber companies in Valdivia, the initiation of the cellulose industry, and the first massive reforestation with non-native Monterey pine (*Pinus radiata*): forest industrialization had begun (Durán 2006).

As Armesto et al. (2001) point out, though Chile’s timber industry started as a “small-scale operation, based on mobile sawmills and selective logging of native forest stands”, it rapidly transformed to an “industrial business based largely on commercial plantations of fast-growing timber trees” (p. 872). At first, forest companies created plantations on abandoned agricultural fields and pastures, as well as eroded areas (Armesto et al. 1994). However, forests previously altered by burning and/or the high-grading of specific species (e.g., alerce, ciprés and araucaria) were perceived as “degraded” and ultimately became fair game for substitution by exotics (Armesto et al. 1994, Neira et al. 2002). According to Armesto et al. (1994), in 1940 there were about 1 million hectares of second growth forests, but instead of being managed, they
were burned and replanted with pine. By 1950, plantation-grown pine had replaced native lumber, and native forests were seen as a marginal resource given that most accessible high-quality wood had been extracted (Clapp 1998). Thus, with the development of Chile’s forestry sector, the historical trend of native forest loss and conversion continued while a new tension between native and non-native forest cover was created (Armesto 1994, Clapp 1998, Neira et al. 2002, Durán 2006).

Since its inception, Chile’s forestry sector has been dominated by the interests of the industry: institutions and laws have been created to facilitate the creation of exotic tree plantations (Hughes 2002, Neira et al. 2002, Durán 2006). For example, the primary association of Chilean forestry companies, Corporación de Madera (CORMA), was founded in 1952, and the state agency that supports public and private forest use, Instituto Forestal (INFOR) was founded in 1960; however, the Chilean institution that regulates forest management and is in charge of protected areas, Corporación Nacional Forestal (CONAF), was not created until 1971 (Neira et al. 2002, Durán 2006). Neo-liberal economic and resource management policies established during the Pinochet dictatorship (1973-1990) cemented the role of plantation forestry in Chile’s economy and continue to significantly affect the status of native forests in today’s forest sector (Clapp 1998, Hughes 2002, Neira et al. 2002). As part of the military regime’s program of structural adjustments, the forest industry was transferred to the hands of the private sector, and the state’s role became limited to the following: “control of legislation affecting the forest sector, promotion of forest-related activities developed by the private sector, and management of protected areas and other land under the National System of Protected Wildlands (SNAPSE)” (Neira et al. 2002, p. 21).
Given the above, it is thus no surprise that the Forest Development Law of 1974 (Law 701) – the first major forest-related law since 1931 – included both subsidies for plantations and a tax exemption for reforested lands (Neira et al. 2002). This policy caused a boom in industrial plantations. According to Armesto et al. (2001), about 2 million hectares of Monterey pine were planted between 1974 and 1994. During this period, plantation forestry became a significant component of the economy. Concurrently, the forestry sector determined that native forests could be exploited to supply hardwood chips for export, thus initiating the wood chip industry and hastening the clearing of the Valdivian Rainforest (Clapp 1998). In the 1980s, the forest industry grew at twice that of Chile’s economy as a whole. As of 1995 forest products accounted for more than 10 percent of the value of all exports (equivalent to all fishing and agricultural exports combined). The majority of forest product export revenues came from plantations, particularly wood pulp or cellulose, of which Japan, Belgium and West Germany were the main purchasers (Wilcox 1996).

Despite the contribution of the forestry sector to Chile’s economy, social change and ecological degradation are attributed to the “export oriented exotic species tree plantation model” (Hughes 2002, p. 84; Wilcox 1996, Armesto et al. 2001, Neira et al. 2002). Policies established by Law 701 obliged many small landholders to sell off their holdings and either migrate to cities or join the forestry sector as temporary workers subject to poor wages and working conditions (Hughes 2002). The social effects of plantation forestry continue to include rural poverty, disruption of local subsistence economies, conflicts between small landholders (including indigenous communities) and forestry companies, health risks due to pesticides, and reduced quality of life given changes in the water cycle (Armesto et al. 2001, Hughes 2002, Kerosky 2007). The export-oriented forestry model has also contributed to biodiversity loss (Armesto et
Reflecting on the state of Chile’s forests in 1994, Aremesto et al. (1994) write, “In less than 200 years, the forests have disappeared in those locations of major diversity and endemism, just where the refugios were during the glacial period. The result of this process has been that the area of Chilean temperate forests has been reduced by human impact during the last two centuries in a magnitude similar to the decrease experienced in the last ice age” (p. 71).

As a result of Chile’s history of forest burning, clearing and conversion, the country’s native forests are currently highly fragmented. Today, there are about 15.6 million hectares of forest cover in Chile (Neira et al. 2002). While 85.9 percent this consists of native forests, only about 38 percent consists of mature native forests. The largest tracts of mature forests are concentrated in the south-central and southern parts of the country (with the highest percentage in Region XI). Forest-related legislation has offered few management guidelines for native forests, almost none of which have pertained to conservation. Besides those native forests located in protected areas, Law 701 applied protections only to forests perceived as critical to watershed protection and soil stabilization, or to the specific tree species given Natural Monument status. Also, though Law 701 mandated the use of management plans prior to forest harvest, clearing or planting, as well as penalties for violations of management policies, sanctions were often not enforced due to limited funding and staffing (Neira et al. 2002). The resulting highly visible effects of forest loss – homogenization of the landscape due to tree plantations, and the rapid clearing of native forests for the wood chips industry – have generated an environmental consciousness amidst Chile’s public that spurred the debate surrounding the newest forest law (Clapp 1998, Armesto et al. 2001). While environmental conservationists, small landholders and others called for subsidies to promote sustainable management of native forests, the forest industry – backed by longstanding forest management practices and the two
large companies that control the majority of Chile’s plantations (Matte Holding and Angelini) – lobbied against such measures (Neira et al. 2002).

Nevertheless, the Native Forest Law was finally passed in 2008, after 15 years in the legislature. The law includes financial and social instruments in support of native forest management. A fund of $8 million (USD) a year for the next 30 years was established to promote the capacity of large and small landholders to engage in native forest conservation, recovery and sustainable management (Kerosky 2007, Leighton 2007). Additional financial resources may be provided for scientific research and technology development (Leighton 2007). The 2008 Native Forest Law also established an advisory council consisting of a variety of stakeholders who are meant to participate in the application and modification of the law: the Minister of Agriculture, other government agency personnel, academics, members of non-governmental organizations, and landowners (Kerosky 2007, Leighton 2007). Despite the above, critics contend that the law does not include strong enough conservation measures. For example, it does not offer significant protections for the remaining areas of high biodiversity, nor does it address the long-running issue of the CONAF’s lack of capacity to effectively enforce management policies (Kerosky 2007). While the new law effectively describes native forests as the subject of management policies (as opposed to areas of marginal resources or future plantations), it remains to be seen what will happen on the ground. In summary, native forest management in Chile today can best be understood in light of changing perspectives regarding what constitutes appropriate and sustainable use of forests and which native species are considered valuable beyond economic terms (Clapp 1998).
Locating Tortel

Lives and livelihoods in the Tortel area have been shaped by natural features of the landscape as well as national land management decisions in ways that parallel, but are distinct from, the development of Chile’s more northern forested regions. In this section, I will locate Tortel within the broader setting of the Aysén Region, mention the multi-scalar processes that influenced colonization of the Baker, Bravo, Pascua and Huemul river valleys and continue to affect the area, and hint at life and times in Tortel today.

As mentioned previously, Chile’s Region XI encompasses an enormous area: about 41,900mi². The geography of Aysén – characterized by the channels and islands of the fjords, the mountainous and glaciated terrain of the Andes, and huge swaths of dense temperate rainforests – has restricted human settlement to river valleys and limited the connections between communities. Not only is the majority of travel within the Region limited to a single major road (that is only partially paved), but access to adjacent regions (including the more-developed parts of Chile to the north) must be gained by boat, plane or overland via Argentina. Given the extreme distances between Region XI’s commercial centers (e.g., Puerto Aysén and Coyhaique) and its southern reaches, communities in southern Aysén remain almost as isolated today as they did when the Region was first settled. This isolation has contributed to the fascinating history of the Tortel area, which sets it apart from the rest of Aysén.

Colonization of Region XI was initiated by the Chilean State in the beginning of the 1900s as part of its final major push to extend occupation across the country and manage border disputes with Argentina (Durán 2006). Land settlement was facilitated through huge concessions of fiscal lands and large-scale burning. One such concession of 300,000 hectares included the entirety of the Baker River valley (Wellmann 2003). This concession attracted the
interest of an entrepreneur from the port city of Punta Arenas (located along the Strait of Magellan in Region XII) who, in exchange for its acquisition, agreed to bring settlers to the valley and establish trade/transportation routes linking the mouth of the Baker River to both Punta Arenas and the interior of Aysén (Wellmann 2003). An intersection of State and private business interests thus catalyzed the colonization of the Tortel area. However, I argue that it was the unique combination of these political-economic factors with the landscape and ecology of the Tortel area (in addition to the personalities of the individuals who chose to venture to the area) that led to the founding of the Tortel community. Specific details of Tortel’s history are reserved for Chapter 5. The rest of the section is dedicated to an overview of the setting of this study.

Today, the town of Tortel can be found in the comuna or district of the same name (73° to 76°W, 47° to 49°S; Wellmann 2003) in the province of Capitán Prat at the far south of Region XI (refer to Figure 1). About 300 people live in the town proper (Becerra 2009), which is situated between the mouth of the Baker River and a small cove off of the mainland. The majority of the other 200 residents of the Tortel community live along the Baker, Bravo, Pascua and Huemul drainages (though some families still have isolated homesteads in the fjords). These river valleys were crucial travel routes historically and continue to offer relatively flat sites for establishing homes and pastures. Other defining landscape features of the Tortel comuna include the Northern and Southern Patagonian Ice Fields, which feed the river systems, as well as the undeveloped and remote tracts of forested mountains and fjords that contribute to Chile’s system of protected areas. (About 80% of the comuna consists of National Parks and Reserves.)

The Tortel area has a cold and moist temperate climate with an annual rainfall of 3500 to 4000mm and a mean average annual temperature of 6° to 8° C (Guitérrez 2007). This climate supports the ecology the region, which is characterized by the North Patagonian Rainforest and
its associated forest types (including ciprés de las Guaitecas; refer to the first section of this chapter), but also includes a significant coverage of peatlands dominated by *Sphagnum* moss and cushion species of vascular plants. The most extensive peatlands form part of the unique forest-wetland complexes that line the once-glaciated terrain of the river valleys of the Tortel area\(^2\). These are the systems that have offered the key natural resource that allowed the Tortel community to develop: the fires that were used to clear the way for the initial colonization of the region left standing dead ciprés trunks in their wake (Figure 2). In the chapters that follow, I explore how the harvest and use of ciprés became the basis for livelihoods in the Tortel area, and what the current scarcity of the ciprés resource, coupled with social, political and economic change, mean for the lives of Tortel’s current residents.

\[\text{Figure 2. Images of standing dead ciprés trunks that have remained following fire and that characterize the ciprés resource: a) forested slopes, fjords; b) peatland and forested uplands, Baker River; c) peatland, Baker River.}\]

\[\text{\(^2\) Due to local climatic gradients (Andrés Holz pers. comm.), peatlands and ciprés stands are not found along the upper reaches of the Baker River and occur in isolation in northern Aysén.}\]
CHAPTER 3: LITERATURE REVIEW

This research is driven by an underlying desire to understand how interrelationships between humans and their environments can be investigated so as to comprehend the causes and consequences of social and ecological change. According to Nygren and Rikoon (2008), political ecology has become one of the most important approaches for accomplishing the above endeavor over the past 15 years. By incorporating and relating notions of power, scale and social construction, political ecology yields “...an integrated understanding of the interconnections between political struggles over environmental resources, cultural meanings attached to the environment, and the ecological dynamics of environmental change” (p. 767). Political ecology is thus also aligned with concerns of environmental justice (see Bosak 2006): the approach often focuses on how the tensions between development and conservation that pervade local to global scales affect resource use and privilege certain actors over others. Indeed, political ecology has contributed to the generation of ‘liberation ecologies’ (Peet and Watts 1996) and social-ecological systems thinking (Berkes et al. 2003), projects that offer robust critiques of dominant development and natural resource management paradigms.

While political ecology can be described in a number of different ways, for the purposes of this study political ecology is conceived as a flexible analytical framework that guides one’s perspective during the research process. In order to investigate human-environment interactions in Tortel, I have constructed a lens from the political ecology ‘toolkit’ (Robbins 2004) that allows me to problematize the current system of natural resource management and resource use, develop methods of data collection and analysis, and identify and examine social and ecological factors that affect the role of ciprés in the lives and livelihoods of Tortel residents.
In this chapter, I establish the efficacy of the political ecology approach undertaken in this study to examine human-environment interactions in a natural resource management context. In the first section, I explore the key conceptual tools comprising the theoretical framework applied in my research. I give a brief overview of political ecology scholarship, including its origins and fields of influence. Then, I discuss how the ‘social construction of nature’ and the ‘politics of scale’ explain the ways in which natural resource management and resource use (hereafter simplified as ‘natural resource management and use’) represent struggles over material conditions and struggles over meaning. In the second section, I focus on two specific theses of political ecology that are prevalent in the literature. I apply these to the case of ciprés harvest in Tortel while drawing upon the interrelated concepts of power, scale and social construction.

A Political Ecology Lens: Power, Scale, and Social Construction

Political ecology is variously referred to as a ‘research theme’ (Turner II and Robbins 2008), ‘theoretical framework’ (Nygren and Rikoon 2008), ‘field of study’ (Bryant 1998, Escobar 1999, Robbins 2004, and Bosak 2006), and ‘specialized branch of critical social theory’ (Peet and Watts 1996). Tracing the conceptual development of political ecology since its origins in the early 1970’s (Bryant 1998, Bosak 2006) reveals the different worldviews and resulting methodological approaches that have been taken by individuals engaging in political ecology research (see Bryant 1998, Robbins 2004, Bosak 2006, Nygren and Rikoon 2008, and Turner II and Robbins 2008 for details regarding the development of political ecology). The antecedents of political ecology emerged from a desire to investigate relationships between humans and the environment and arose from subdisciplines of geography and anthropology, including different permutations of cultural ecology (Bryant 1998, Robbins 2004, Turner II and Robbins 2008). However, it was the perceived impending ‘ecological crisis’ of the 1970s and the attendant
critiques of Malthusian and other apolitical approaches to understanding environmental degradation in the Global South that catalyzed the conceptual and research approaches now thought of as political ecology scholarship (Bryant 1998, Bosak 2006). According to Escobar (1999), these approaches draw upon the following fields: geography, ecological economics, anthropological political economy, social ecology, feminist theory, environmental history, sociology and historical archaeology. This broad range of influence instills the practice of political ecology with a suite of theoretical, methodological and even technological resources (e.g., the concept of ‘scale-jumping’, the technique of in-depth interviews, or the capabilities of a GIS), but does so while guided by overarching ‘common assumptions’ and ‘modes of explanation’ (Robbins 2004, p. 11).

Studies that fall within the rubric of political ecology may be summarized as, “. . . empirical, research-based explorations to explain linkages in the condition and change of social/environmental systems, with explicit consideration of relations of power” (Robbins 2004, p. 12). A political ecology framework for understanding such systems, including the management and use of natural resources, engages two key theoretical concepts. Given an ontological commitment to the ‘social construction of nature’, political ecologists recognize that social and political processes simultaneously reflect and produce different conceptualizations of human-nature interactions, which subsequently affect biophysical reality (Bird 1987, Grieder and Garkovitch 1994, Robbins 2004, Bosak 2008). Meanwhile, engaging scalar theory via the ‘politics of scale’ (Delaney and Leitner 1997, Swngedeouw, 1997, Cox 1998, Haarstad and Fløysand 2007, Molle 2007) reveals how individuals and/or groups of people can be differentiated by the scales at which their interests are located as well as their capacity to assert those interests (Cox 1998). These can be thought of as ‘socio-political’ scales, thus highlighting
the dominant processes that construct the scales and characterize the power relations among and between actors at different scales (Delaney and Leitner 1997, Swyngedouw 1997, Cox 1998, Marston 2000, Swyngedouw 2004). Together, the above theoretical concepts indicate that the choices that dictate natural resource management and use can be seen to represent particular ways of envisioning reality or, more actively, framing particular situations to meet the given ends of the socio-political actor(s) best able to assert their perspectives and effect environmental change (Robbins 2004, Molle 2007, Bosak et al. 2009). (Throughout this document, ‘actors’ refers to individuals and/or groups of individuals, including institutions and organizations.) The social construction of nature and the politics of scale are examined in more detail below in terms of their contributions to a political ecology framework.

A spectrum of beliefs exists concerning exactly what aspects of reality are socially constructed and how (Bird 1987, Grieder and Garkovitch 1994, Robbins 2004, Bosak 2008). A researcher’s particular conception of social construction has implications for his/her normative commitments and thus his/her chosen research subject and methodology (Mike Patterson pers. comm.). For example, Robbins (2004) describes “‘soft’ constructivism” as follows: “. . .the objective world is real and independent of our categorization but filtered through subjective conceptual systems and scientific methods that are socially conditioned” (p. 114). As opposed to “‘hard’ constructivism”, this view allows the biophysical realm to have a role in the production of reality (Bosak 2008), which also creates a role for science in attempting to “get at” the nature of that reality. Although this constructivist perspective validates the use of science, it also asserts that science is itself socially constructed. That is, science can be seen as produced and advanced through negotiations between particular socio-political actors (Bird 1987, Robbins 2004, Wilmsen 2008, Mike Patterson pers. comm.). Furthermore, political ecologists and others
that buy into soft constructivism recognize that science is only one of multiple forms of knowledge-generation (Bird 1987, Robbins 2004, Wilmsen 2008). Given that multiple epistemologies and thus multiple conceptions of nature exist simultaneously, political ecology becomes concerned with how certain socio-political actors assert particular conceptions over others, thereby shaping human-environment interactions and affecting change on the ground.

Political ecologists incorporate the notion of social construction into examinations of struggles over natural resource management and use by examining discourse (Peet and Watts 1996, Bryant 1998, Escobar 1998, Bosak 2006). Discourses may be defined as ‘frameworks that embrace particular combinations of narratives, concepts, ideologies and signifying practices, each relevant to a particular realm of social action’ (Peet and Watts 1996, p. 14; quoting Barnes and Duncan 1992, p. 8). The ‘discursive trend’ in political ecology started in the 1990s when researchers began applying tenets of post-structuralism (Peet and Watts 1996). Post-structuralist scholars sought to challenge dominant paradigms and commonly-held assumptions by questioning the validity of the knowledge used in their creation (Robbins 2004). Such scholars recognized the existence of multiple world views, modes of knowledge generation and perspectives on human-nature relationships. By engaging in discourse analysis, post-structuralists deconstructed ideas such as ‘environmental degradation’ (Forsyth 2008) and even ‘nature’ itself (Escobar 1998), and revealed the multiple (potentially conflicting) conceptions that arise from differing epistemologies.

Discursive approaches make explicit the social construction of human-environment interactions by revealing the power of words to generate meanings or representations and thus frame ideas such that they materialize through changes to the biophysical realm. The overarching question thus shifts from, Who has control of nature? to, Who has control of what
Robbins (2004) writes of the importance of discourse analysis for understanding natural resource management via a political ecology lens:

If accounts about people like herders or farmers or things like cattle or trees are conditioned and stabilized by social structures of power, the problem is not only understanding how social and environmental conditions change over time, or how they become undesirable, or how they can be changed. The problem is also understanding how scientific accounts, government documents, and local stories about those same social and environmental conditions are formed and made powerful by state institutions, media companies, experts, and families. (p. 66)

Weaving together notions of power and social construction, political ecologists are able to interrogate environmental knowledge by examining the socio-political processes at play in knowledge formation, validation and assertion. In the context of resource use, it is thus possible to see that dominant discourses regarding environmental degradation, conservation, and development are embedded in and drive policy and management decisions, often at the expense of local conditions and people (Robbins 2004, Forsyth 2008).

Expanding the political ecology lens to include notions of scale generates robust explanations for how power and social construction become implicated in natural resource management and use. The application of scalar theory depends on three different concepts of scale that are not mutually exclusive (Swyngedouw 2004, Bosak 2006, Molle 2007). I will discuss each concept and apply it to the natural resource management context, in turn. First, scales are typically thought of in geographical terms as spatial extents that have more-or-less-defined boundaries. Through this perspective, scale is material: it is a ‘fixed container’ (Bosak 2006, p. 60) or a ‘nested hierarchy of bounded spaces’ (Delaney and Leitner 1997, p. 93). Often, local to global scales are referred to in this way, and there is an implicit assumption that their bounds represent spatial extents of power. The consideration of power is important given that ‘natural resource management’ implies an enforced system of resource access and use, including
a range of activities from extraction to preservation. However, the idea of fixed scales does not adequately explain the role of power in natural resource management and use.

The second consideration of scale complicates the role of power in the production of scale. Dynamic relations of power – which can be defined along social, cultural, political and economic lines – are seen to transcend the boundaries of the traditionally-conceived local, regional, national and global scales (Swyngedouw 2004, Molle 2007). This perspective of scale indicates that the socio-political processes that constitute natural resource management and use cannot be located solely at the site of resource use or seen to be produced solely through the actions of local individuals (Molle 2007). Instead, natural resource management and use are ‘scaled’ by power relations that operate within and across a variety of scales and on a multiplicity of ecological and socio-political processes. As a result, shifting power dynamics between actors (e.g., local resource users, municipal governments, and/or international NGOs) produce and reflect changes in the scale of natural resource management and use. Given that natural resource management systems are ultimately configurations of human-nature interactions, changing scales also signal changes in the interrelationships between the biophysical and social realms. Swyngedouw (2004) writes, “. . .nature and environmental transformation are also integral parts of the social and material production of scale. More importantly, scalar reconfigurations also produce new sociophysical ecological scales that shape in important ways who will have access to what kind of nature, and the particular trajectories of environmental change” (p. 132).

That scales can be seen to be fluid and transformable rather than fixed (Cox 1998, Swyngedouw 2004) is central to the concept of the politics of scale. This concept highlights the role of scales as ‘an arena of struggle’ (Delaney and Leitner 1997, p. 133) in natural resource
management wherein actors vie for the capacity to determine resource use. Not only are scales produced through power relations, but they are constructed by them as well. The politics of scale thus encompasses the third consideration of scale: scale as a social construction. Socio-political actors employ the concept of scale when framing discourses (Swyngedouw 2004, Bosak 2006, Molle 2007). For example, the geographical area of the Baker River basin can be a social construct that represents either a new source of electricity for the nation of Chile or a river corridor that consists of various sites of local livelihood use. Redefining or ‘re-scaling’ natural resource use such that one’s goals are perceived to be in line with the agenda of more-powerful actors can lead to empowerment. This articulation of interests at more powerful socio-political scales has been referred to as ‘scale-jumping’ (see Cox 1998, Haarstad and Floysand 2007, and Swyngedouw 1997). Such ‘scalar strategies’ (Swyngedouw 2004, p. 132) make explicit how conflicts over the scale of natural resource management play out, both discursively and on the ground.

As an example of the intersection of scalar theory and discourse, Molle (2007) uses a political ecology lens to examine how the actors engaged in conflicts over the management of the Chao Phraya river basin in Thailand use different political constructs in order to frame problems and favor specific courses of action. Molle (2007) writes,

This discourse is influenced not only by ideologies (e.g., market- or community-based solutions), worldviews (e.g. production/livelihoods vs. conservation) and global hegemonic concepts (e.g. IWRM, river basin management) but also by political clout (rural vs. urban), the relative influence of the various stakeholders or interest groups, and the relative weights of the state and the civil society. (p. 361)

In this case, participating in struggles over policy discourse could allow some actors to represent or re-scale river use so that the environmental impacts of damming portions of the river basin are not simply perceived as externalities, but as detrimental to local lives and livelihoods.
Manipulating the concept of scale thus becomes a strategy for affecting natural resource management decisions. According to Haarstad and Fløysand (2007), “Rescaling political claims to larger scales involves a rearticulation of the claims in order to make them correspond to the hegemonic discourses at these scales. In other words, the actors who rescale claims shape them in specific ways to draw legitimacy and support” (294). These researchers found that local farmers in Tambogrande, Peru were able to network with organizations at national and international scales and rearticulate the vision of appropriate land use such that several proposed mining projects were cancelled.

In summary, as a material and discursive subject, scale offers political ecologists a powerful tool for explaining how struggles over real conditions interrelate with struggles over meaning. As Swyngedouw (2004) writes, “The mobilization of scalar narratives, scalar politics, and scalar practices, then, becomes an integral part of political power struggles and strategies. This propels considerations of scale to the forefront of both ecological and emancipatory politics” (p. 134). By taking a scalar approach that integrates notions of power and social construction, researchers can investigate a system of natural resource management in the following ways: researchers can examine how the ecology of a resource relates to historic and current patterns of social, political and economic access to and use of the resource. Concurrently, researchers can use discourse analysis to reveal the particular conceptions of the resource that are translated into policy and/or management schemes by specific socio-political actors towards particular ends (Robbins 2000, Robbins 2004, Bosak 2008).

Political Ecology Perspectives: Degradation and Marginalization, Conservation and Control

In this section, I will engage the conceptual tools developed above to explore two of the primary ‘theses’ (Robbins 2004, p. 14) guiding political ecology explanations of human-
environment interactions and environmental change, and how they might contribute to an understanding of the current role of ciprés in lives/livelihoods in Caleta Tortel. Environmental degradation and conservation are often the focus of political ecology scholarship because they are problematic concepts that are often treated uncritically in the arenas of development and biodiversity conservation (see Robbins 2004, Bosak 2006, and Campese 2009). Due to similarities in the dominant economic, political and social paradigms that drive environmental degradation and conservation, I will begin by reviewing the scalar nature of these processes concurrently and in a general sense (though with an eye to the Global South). I will show that degradation and conservation are linked, often through the marginalization of local people, and that this link is exposed by examining discourse. Then I will proceed with a discussion of how the current status of ciprés can be seen to be produced through multi-scalar political and economic processes that affect local material conditions and are perpetuated by conflicting socio-political discourses regarding the value of the tree species.

Though multiple groups of people from different socio-political scales are often affected by natural resource management decisions, not all groups are involved in that process nor participate equally (Rocheleau 2005, Duncan and Lach 2006, Roth 2007). In part, this has to do with historical patterns of land ownership and use, subsequent environmental and social degradation, and the types of development and conservation efforts engaged in response to those impacts. The historical role and power of the state (Cox 2002) is of special concern given that national governments still tend to be the primary land owners and managers. The nature of the power relations between the state and the local can be shown to have developed through colonization and its aftermath, which encouraged nation-states to seize lands for export agriculture and disrupt traditional systems of land use (McMichael 2004), and thus established a
legacy by which local communities have lost (and continue to lose) control over the access and use of the lands on which they reside and depend. Today, commercial interests (such as inter- or multinational corporations), large landowners, and local elites may also own and/or control the management of large tracts of land (Rocheleau 2005, Tsing et al. 2005). Green Revolution mandates (McMichael 2004) and contemporary practices of land management that are driven by the imperative of the market economy to expand and generate capital at the expense of local livelihoods and ecosystems have resulted in widespread environmental and social degradation across the globe (Berkes and Folke 1998, McMichael 2004). However, this environmental and social degradation is often framed in terms of “problems” generated by the “poor” land management practices of those politically and economically marginalized populations whose historic land use and livelihood practices have been replaced (Steve Siebert pers. comm.; see Dove 1993).

That environmental degradation and marginalization (including social, political and economic marginalization) are intimately connected due to political-economic processes is one of the primary theses of political ecology (Robbins 2004). Marginalization can be seen to consist of ecological and economic feedbacks:

Marginalization, Blaikie and Brookfield argued, is a process whereby politically and socially marginal (disempowered) people are pushed into ecologically marginal (vulnerable and unstable) spaces and economically marginal (dependent and narrowly adaptable) social positions, resulting in their increasing demands on the marginal (increasingly limited) productivity of ecosystems. (Robbins 2004, p. 77)

Generally, “proof” for this link between environmental degradation and marginalization comes from research of traditional resource management systems that have recently been integrated into regional or global markets. Following this ‘up-scaling’ in resource use, a breakdown in the local management system occurs because resource users are now faced with an economic imperative
that is dependent upon over-exploitation. Not only is pressure placed on the environment, but social systems can be affected such that a group of resource users once able to handle environmental unpredictability (e.g., drought) and consequent hardship is now organized around different divisions of power (Robbins 2004).

In response to widespread environmental degradation, conservation efforts (especially those driven by international actors in the 1980s and 1990s; Bawa et al. 2004) turned towards a technique of erecting barriers around areas deemed hotspots of biodiversity or critical natural capital. Such protected areas in effect continued the imperialist process of displacing people from their homelands and/or restricting their access and use of subsistence resources (Hutton et al., 2005). The conservation and control thesis of political ecology explains why and how conservation efforts (which, for the purposes of this proposal, are considered part of the spectrum of activities that constitute natural resource management regimes) can have unintended effects that result in political and economic exclusion and ultimately result in environmental degradation (Robbins 2004).

Robbins writes that the command and control thesis, “...reflects an increasingly prominent understanding of conservation territories, as bounded, regular, polygons, as ecologically and socially problematic, and inadequate to meet the goals of preservation either of wildlife or livelihoods” (p. 150). Political ecologists blame the inadequacy of dominant conservation strategies, in part, on the limited conception of human-environment interactions that guides their implementation: one that either conceives of humans as external to the natural realm, or that values the well-being of the natural or biophysical realm over that of the human realm. The use of the term ‘biodiversity’ reflects the above problems. During his research on the intersection of biodiversity discourse and the struggles of black communities to gain control
of territory in the Pacific rainforest region of Colombia, Escobar (1998) found that four distinct socio-political groups defined and used the concept of biodiversity differently. He concluded, “From a discursive perspective, then, biodiversity does not exist in an absolute sense. Rather, it anchors a discourse that articulates a new relation between nature and society in global contexts of science, cultures, and economics” (p. 55). For the local actors in Escobar’s study, the acceptance of an overarching a-political, modernist framing of biodiversity within the global conservation and development realm in the 1980s contrasted with local perceptions of nature and threatened local autonomy, knowledge, identity and economy.

In the literature, the application of conservation ideology is commonly critiqued when it results in economic and physical exclusion (Campese 2009). Protected areas in particular turn into geographical locations that are, in effect, the spatially ‘bounded polygons’ to which Robbins refers and which are problematic in that people become estranged from the locations in which their traditional systems of resource use were developed and upon which their livelihoods and culture depend. Not only is this socially unjust, but it can promote environmental degradation by eliminating people’s means to meet their basic livelihood needs in sustainable ways (Campese 2009). Conservation policies and initiatives that deny or otherwise limit peoples’ access to individual plant and animal species can be critiqued along the same lines. What conceptions of nature guide the implementation of such policies, and at what scales? What kinds of geographical mosaics of exclusion and access are created, who is affected in what ways, and what environmental changes result?

Swyngedouw’s work (2004) offers a model for how a theoretical lens based on power, scale and social construction can be used to examine how particular human-environment interactions result from conservation activities or other types of natural resource management
scenarios. A primary contribution is the application of the concept of ‘historical-geographical materialism’ (Swyngedouw 2004, p. 130). Historical-geographical materialism is akin to the concept of a ‘broad political economy’, which has been fundamental to political ecology scholarship:

... almost all political and environmental explanations center on who controls resources and how the rules and conditions of production and exchange are set in political struggle. But this political economy is defined very broadly to encompass a range of spheres in which power is exerted, whether it is control of labor, land or ideas. (Robbins 2004, p. 80)

I argue that historical-geographical materialism, while similar to a broad political economy, lends itself to more-nuanced explanations of human-environment interactions and environmental change through explicit attention to 1) the material and discursive construction of scale, 2) the transformation of nature, and 3) historical context (Swyngedouw 2004). Following the neo-Marxists’ ‘historical materialism’, the above concept is based on the idea that human consumption of nature is inevitable. However, Swyngedouw’s version of historical materialism is not limited in scope to capitalist structural processes. Thus his explanations of environmental change are not based solely on mechanism(s) by which modes of production necessarily result in unequal social relations and degraded nature. Rather, historical-geographical materialism recognizes that human use of the environment results in a transformation or ‘creative destruction’ (p. 131) of nature due to a multiplicity of social, cultural, political, economic and ecological processes that change over time and space. Swyngedouw (2004) writes, “In sum, the condition of everyday life resides in the twin condition of the essential transformation of nature (place) on the one hand and sociospatial relations through which this transformation is organized and controlled on the other” (p. 134). Moreover, “The social appropriation and transformation of nature produces historically specific social and physical natures . . . .” (p. 130). Thus, by
drawing on historical-geographical materialism, it is possible to examine socio-political processes at local to global scales, and aligned across multiple axes of power, to see how they interrelate with the environment and local people.

Ciprés can be seen to belong to a ‘politcized nature’ that is produced through the scalar relations and constructed by the discourses that drive resource management in Chile. While ciprés is harvested by people at the local scale, this activity does not happen in isolation. Rather, it is connected to a variety of social, political and economic processes. Multiple international and national policies apply to ciprés. These policies have emerged over time in response to the perspectives and goals of a variety of non-local socio-political actors engaged in the arenas of biodiversity conservation, forestry and/or cultural heritage preservation. How their policies define ciprés and become implemented at the local scale has important implications for environmental and social justice. This investigation has been designed to reveal the consistency with which international and national policies correspond to local conditions and perspectives and thus support or hinder the continuing role of ciprés in the lives/livelihoods of Tortel community members.
CHAPTER 4: METHODS

Drawing upon a political ecology framework, this study recognizes that ciprés is simultaneously a quantifiable timber resource that can be characterized by the physiology and ecology of the tree species, and the object of a politically/economically/socially/culturally-mediated practice (i.e., timber harvest) that also defines the context and character of that resource. In order to fully appreciate ciprés as a resource, it is necessary to investigate the multiple understandings of ciprés as perceived by the various socio-political actors engaged in its use and management. Thus, this research has examined ciprés harvest through methods that get at both the material/biophysical nature of the resource and the socially constructed nature of the resource at different scales of use and management. In the following sections, I will describe the philosophical commitments guiding this investigation, list my specific research questions, and detail the processes of data collection and analysis that have generated the results and informed the discussion and conclusions of the study.

Normative Commitments

In keeping with the political ecology framework established in the preceding chapter, this research is founded upon a soft constructivist approach to understanding reality. Thus, in examining the role of ciprés harvest in the lives and livelihoods of Tortel community members, it becomes essential to pursue the multiple conceptions of ciprés that affect its use and management: ciprés the biophysical entity, ciprés the livelihood resource, and ciprés as defined by any other meanings ascribed to it by individual actors or groups of actors. (Throughout this thesis, ‘community’ is understood to be a problematic concept [Agrawal and Gibson 1999, and Belsky 2000]. In referring to Tortel or local ‘community members’, my intent is to refer to those individuals who reside in the lower reaches of the Baker, Bravo and Pascua River drainages and
in the Steffens Glacier area and whose lives are or have been intimately connected to ciprés harvest. Beyond the understanding that many of these individuals share a unique history, which was in part revealed through this investigation, I have attempted to avoid assumptions regarding the similarity of people’s experiences, perceptions, desires, etc.) Furthermore, the soft constructivist ontology allows rigorous scientific investigation based on the collection and analysis of empirical evidence to contribute to “getting at” reality – in this case, the role of ciprés in Tortel – while recognizing that there are ways of knowing besides through Western scientific methods. As a result, this study not only acknowledges that multiple understandings of ciprés exist simultaneously, but that some of these understandings could be derived through ways of knowing that differ from my own. Finally, by using a political ecology framework, I assert that power struggles between different social-political actors have an explicit role in determining natural resource use and management. In this study, I specifically sought to involve those actors who are often left out of the decision-making process – local resource users – and I thought of these individuals as knowledge holders and skilled practitioners.

The notion of valuing local/practical ecological knowledge has received increasing attention from development practitioners (Wilmsen 2008) and land managers (Berkes and Folke 1998, Klooster 2002, Ballard and Sarathy 2008). Their interests in understanding and possibly integrating local/practical ecological knowledge with traditional Western ways of doing and knowing converge through methodological approaches known as “participatory research”. According to Wilmsen (2008), participatory research practitioners “. . . explicitly acknowledge that the knowledge science produces is negotiated. Moreover, they seek to expand the pool of people involved in that negotiation. . . .” (p. 13). They do so “. . . 1) to produce better explanations by incorporating within analyses the knowledge that non-scientists possess about
the phenomena with which they are directly engaged; and 2) to address relationships of power that inhibit amelioration of very real human problems such as poverty, income disparity, environmental degradation and conflict over land-use and natural resource management” (p. 13). While participatory research (as defined by Wilmsen 2008, Wulfhorst et al. 2008) appears to have philosophical commitments that overlap and are internally consistent with those of political ecology (Zimmerer and Bassett 2003, Robbins 2004), participatory approaches have a more explicit axiological commitment to action. That is, participatory research is dedicated to seeking out and applying those ‘less coercive, less exploitive, and more sustainable ways of doing things’ of which Robbins (2004, p. 12) writes. Furthermore, participatory research is based on the premise of democratic inclusion/participation in the research process (Wilmsen 2008).

As an example of participatory research, one can consider the project undertaken by Ballard and Sarathy (2008) of salal harvest – salal is a native woody understory shrub – on Washington’s Olympic Peninsula. Despite the relative lack of information in the scientific literature pertaining to salal ecology, the authors were able to collaborate with salal harvesters to adjust the study design so as to determine and operationalize the ecological variables most important for understanding the impacts of harvest on the resource. The authors write the following in support of working with local practitioners: “By virtue of their hands-on experience, such groups actively shape the natural terrain, have specialized ecological knowledge about forests and have a stake in managing the resources upon which their livelihoods depend” (p. 168). The above ideas suggest that using a participatory approach to integrate ciprés harvesters’ knowledge of ciprés ecology with the results of standard Western forestry techniques can not only yield a more complete understanding of the current distribution and availability of the resource, but promote the capacity of ciprés harvesters to make positive
changes in their lives, including significant participation in the development of a management plan for the remaining ciprés resource.

The ideal standard of participatory research calls for research to be instigated and more or less controlled by local research participants rather than an outside academic researcher (Wulfhorst et al. 2008, CFERP 2009). While I hope that the design of this study veered away from so-called “extractive research” (Wilmsen 2008, p. 15), I acknowledge that outside influences (i.e., those connected to CIEP, CONAF and the University of Montana, as well as my own personal motivations) drove the investigation and that the participation of Tortel community members was limited. Nevertheless, the thinking behind this project’s approach originates from an affinity for the axiological commitments of participatory research. Indeed, I hope that by instigating a scientific study that included a qualitative approach in response to forestry research needs driven by CIEP and CONAF, the study may inspire a new conception on the part of those institutions of the capacity of local people to take part in such research. In addition, I hope that the results of the research will, 1) be applied directly toward the goal of evaluating the potential for the sustainable management of the remaining ciprés resource (even in the sense of providing a basis for asking the next questions that pre-empt that activity), and 2) suggest to both Tortel community members and regional institutions the ways in which local people can be empowered to have a significant role in that process.

**Data Collection and Analysis**

This investigation used a case study methodology to explore the human-environment interactions constituted by Tortel community members’ harvest of ciprés. According to Yin (2003), a case study is an empirical approach to research that is guided by theory, explicitly recognizes the context of the phenomenon under investigation, and calls for the triangulation of
data from multiple sources in order to get at the relationships between phenomenon and context.

In the case of ciprés harvest by Tortel community members, research is guided by the
intersection of political ecology and scalar theory, the multi-faceted context of the practice is
recognized, and data collection stems from multiple methods, as explained below. Finally, the
case study approach is also warranted given the researcher’s academic pursuit of international
conservation and development (ICD) as an applied field and thus the desire to explore, in situ,
how rigorous scientific investigation can be used to guide such endeavors.

The following research questions were addressed using the associated methods of data
collection and analysis:

1) What is the distribution, abundance and quality of ciprés in the Tortel vicinity?
   - Ciprés stands throughout the Tortel area were ground-truthed; habitat surveys
     and stand inventories based on standard forestry protocols were initiated.
   - Participant observation and semi-structured interviews were engaged in Tortel
     and during field visits with ciprés harvesters. The qualitative data generated in
     this manner were used iteratively with the researcher’s own observations to
     inform a qualitative understanding of the ecology and resource base of ciprés.

2) What local/practical ecological knowledge is held by Tortel community members who
   have been or are currently engaged in the practice of harvesting ciprés?
   - Participant observation and semi-structured interviews were engaged in Tortel
     and during field visits with ciprés harvesters. Data generated in this manner
     were subject to qualitative content analysis in order to reveal emergent and
     recurring themes.

3) What significance does the practice of ciprés harvest have for the lives and livelihoods of
   Tortel community members, and how has it changed over time?
   - Participant observation and semi-structured interviews were engaged in Tortel
     and during field visits with ciprés harvesters. Data generated in this manner
     were subject to qualitative content analysis in order to reveal emergent and
     recurring themes related to the above subjects.
   - Transcribed participant observation notes and interviews were also subject to
discourse analysis, as were archival documents, in order to explore the social
   construction of ciprés at the local scale.
   - Archival documents were also reviewed for information regarding the historical
   context of ciprés harvest.
4) What are Tortel community members’ perceptions of the barriers to the harvest of dead ciprés and how they can be overcome?

- Participant observation and semi-structured interviews were engaged in Tortel and during field visits with ciprés harvesters. Data generated in this manner were subject to qualitative content analysis in order to reveal emergent and recurring themes related to the above subject.

5) Research Question 5: How is ciprés conceptualized at international and national policy scales and what are the implications for ciprés harvest in the Tortel comuna?

- Various policy documents were subject to discourse analysis in order to explore the social construction of ciprés conservation/management scales.

Ultimately, I conducted habitat inventories at 10 different sites; I compiled hand-written notes following informal conversations with 37 Tortel community members; I completed ten digitally-recorded and 2 hand-written semi-structured interviews of 40-70 minutes in length; and I analyzed 2 historical texts and 5 policy documents.

For the purposes of this research, using different types of methods – ground-truthing and qualitative characterization of ciprés stands, participant observation and semi-structured interviews with Tortel residents, discourse analysis, and archival research – was necessary in order to respond to the biophysical vs. socially-constructed dichotomy that characterizes the ciprés resource. One advantage of the mixed methods approach is its ability to balance the strengths and weaknesses of different methods in order to yield a more “comprehensive empirical record about a topic” (Axinn and Pearce 2006, p. 2). Also, according to Elwood and Cope (2009),

Distinguished from ‘multiple methods’ projects in which different methods are practiced in parallel, mixed methods projects weave together diverse research techniques to fill gaps, add context, envision multiple truths, play different sources of data off each other, and provide a sense of both the general and the particular. In these approaches, insights gained from one technique, subject group, or data source may be examined recursively with other findings, and the path of research may be shifted in response (p. 4-5).

The integration, or mixing, of various qualitative research approaches was used not only to capture the ecological and social details/context of ciprés harvest, but ensure that the study
defined and investigated the ciprés resource as utilized and perceived by Tortel community members. This integration has occurred, in part, by using local knowledge and perceptions as a bridge that connects the distinct methods at different stages of the research process. For example, participant observation and semi-structured interviews provided rich, contextual details regarding the quality of the ciprés resource and issues of access/use, and these informed the researcher’s approach to evaluating ciprés stands during field visits. The project thus sought to capture the relevance of the ciprés resource for Tortel community members in a nuanced sense that is beyond what would have been revealed through a forest inventory conducted solely by the researcher. In addition, a review of historical texts allowed the current status of the tree species and its role in lives/livelihoods to be examined within their historical context. Finally, discourse analysis of legal texts revealed the concepts of ciprés that are prevalent at socio-political scale at which forest management and conservation policy is implemented.

Fieldwork was conducted between January and July 2010. Financial, logistical and scientific support were provided by the Center for the Investigation of Patagonian Ecosystems (CIEP), a scientific research institute dedicated to investigating a variety of systems and subjects from continental to maritime Patagonia, and the only institute of its kind in Aysén. CIEP is responsible to and receives funding from the Regional government and several Chilean universities, and has affiliations with multiple international universities (including the University of Montana). I used the CIEP office as a “base of operations” and traveled frequently between Coyhaique (the Region’s capital) and Tortel during my first two months of residence in Chile. The majority of the latter four months were spent almost entirely in the Tortel area, and I rented a one-room apartment from a local family in the town proper. (CIEP has a presence in Tortel via
a laboratory that was recently constructed; however, this space was unoccupied for the majority of my stay in Tortel.)

The original intent of my fieldwork was to investigate the availability of ciprés as defined through standard forestry approaches advanced by CIEP and CONAF, in addition to Tortel residents’ knowledge and perceptions of the tree species and its use/management as revealed through semi-structured interviews. However, what I encountered on the ground – in terms of the nature and extent of ciprés distribution – differed markedly from expectations conceived while writing my research proposal. It also became apparent that I needed more-detailed information regarding the management and conservation policies pertaining to ciprés harvest in order to better understand the current status of the tree species. As will be explained in more detail later in this chapter, my research objectives changed due to new information revealed through the fieldwork process plus the usual constraints of time and funding.

Though this study did not take a full participatory approach, research was implemented so as to encourage the participation of local community members. Community members were asked to participate in the following ways: as key informants, field guides, and interviewees. Given the potential sensitivity of the subject matter – that illegal ciprés harvesting might have been widespread – it was assumed that information related to the specific details of ciprés harvest (e.g., where it occurs and who is involved in what ways, how many trees are removed through what methods, where/how ciprés wood is consumed and by whom) were better discerned opportunistically via participant observation with a small number of key informants, rather than through sampling the Tortel community at large. The ‘specific details’ of ciprés harvest were pursued in order to inform the researcher’s understanding of the practice of ciprés harvest, however the project was designed to rigorously investigate the larger-scale context of
the practice: how Tortel community members’ knowledge of the tree species, perceptions of its role in their daily lives, and concerns regarding their abilities to access and use ciprés contribute to an understanding of the current availability of the resource.

The various methods used to address the project’s research questions are described in more detail as follows:

**Biophysical Context – Ciprés Habitat and Resource Observations**

Research Question 1: What is the distribution, abundance and quality of ciprés in the Tortel vicinity?

Initially, standard forestry techniques were to be used to quantify the remaining ciprés resource in the vicinity of Tortel in terms of abundance by size/age class and yield, and to characterize ciprés stands by regeneration status. While collaborating with Dr. Brian Reid, a Resident Investigator at CIEP, it was determined that the forestry protocol should be expanded to allow for the collection of data on biotic and abiotic characteristics of ciprés habitats. In this way, ciprés distribution, yield, and/or regeneration could be related to site conditions (e.g., vegetative community composition, slope, soil type and/or moisture gradients). Determining the above relationships could reveal the factors limiting the establishment and growth of ciprés. In addition, the above data would provide information regarding the ecological context of ciprés harvest (Paul Alaback *pers comm.*), which is a necessary precursor to understanding the current status of the species as well as the development of any future management plans.

While surveys of ciprés stands were initiated, it became apparent that the objective of rigorously quantifying the remaining resource could not be completed in a single field season by a single fieldworker given the following conditions: standing dead ciprés was found to be widely distributed across the Tortel area; within individual sites, ciprés stands were patchy and
showed a high degree of variation in structural composition that was not obviously related to environmental gradients (suggesting that different methods were needed in order to collect forestry vs. habitat data); and the majority of the most accessible remaining stands of dead ciprés were located on private property. This latter finding called into question the appropriateness of 1) collecting forestry and habitat data whose relevance to the property holders themselves was not understood, and 2) presenting such data to the Tortel Municipality, CONAF and/or CIEP -- institutions that might be able to utilize the information, but with unknown implications for individual land owners.

Ciprés habitat and stand inventory plots were ultimately conducted at 10 different sites in the Tortel area. However, the number and distribution of plots was such that statistical analysis could not be used to generate meaningful inferences regarding the effects of habitat characteristics on ciprés stand dynamics. Details regarding habitat and stand inventory sampling will not be discussed in this document. Instead, the sampling protocol and data that has been collected will be summarized and presented to CIEP in the form of a final project report and will serve as the basis for future investigations of ciprés ecology.

Though the quantitative ciprés inventory was not completed, the observations of ciprés habitats and harvest sites amassed through six months of fieldwork generate a more complete understanding of the local conditions that form the basis of ciprés harvest. The qualitative observations of ciprés sites most relevant to this document include the following: habitat type (e.g., peatland or forest), presence of regeneration, and anthropogenic effects (e.g., harvest, ditching, grazing, fire). Observations were documented using written field notes and digital photos; hard copy maps, aerial photos and a GPS unit were used to capture their geographic location. Observations were made while traveling extensively across the Cochrane and Tortel
comunas via automobile, motorboat, lancha, inflatable raft and foot, ground-truthing specific sites while conducting the quantitative inventory, but also recording observations opportunistically as I encountered the tree species. For example, from bus windows, I noted the presence of live and dead ciprés, or piles of wood products outside of people’s homes; I stopped to make observations while traveling between destinations with a borrowed personal vehicle; and I unexpectedly encountered an alpine ciprés community while recreating near the Steffens Glacier of the Southern Ice Cap.

The local/practical ecological knowledge revealed by ciprés harvesters through participant observation and semi-structured interviews, as described below, was used iteratively with my observations to draw general conclusions regarding the distribution, abundance and quality of the remaining ciprés resource. Not only were harvesters’ geographical knowledge of ciprés distribution able to corroborate the specific locations where ciprés habitat and resource observations could take place, but their perspectives and knowledge indicated which types of observations were most important for capturing meaningful/applicable information about ciprés. For example, ciprés harvesters’ perspectives as to the size classes of ciprés that are most valuable or otherwise most useful helped determine how the abundance of the ciprés resource was described. In addition, local perceptions of resource accessibility and quality were used to further identify and evaluate those sites containing ciprés that are or can be considered valuable/exploitable by community members.

Livelihood Context – Participant Observation/Semi-structured Interviews/Analysis of Archival Documents

Research Questions 2 - 4:
• What local/practical ecological knowledge is held by Tortel community members who have been or are currently engaged in the practice of harvesting ciprés?
What significance does the practice of ciprés harvest have for the lives and livelihoods of Tortel community members, and how has it changed over time?

What are Tortel community members’ perceptions of the barriers to the harvest of dead ciprés and how they can be overcome?

In order to examine the role of ciprés in local lives and livelihoods, I collected and analyzed a variety of different texts. Notes resulting from participant observation, transcribed semi-structured interviews, and histories written by local authors were subject to either content or discourse analysis. First I will discuss the various processes of data collection, and then I will describe how the resulting data were analyzed.

**Participant Observation**

I engaged in participant observation given my interest in the meanings of ciprés as held by ‘insiders’ whose everyday lives are intimately associated with the tree (Jorgenson 1989). While living in Tortel for four months, I was a ‘limited observer’ in the words of Ely et al. (1991): one who “observes, asks questions, and builds trust over time, but doesn’t have a public role other than researcher” (p. 45). My immersion in the setting of Tortel granted me the opportunity to learn about the roles of ciprés from my own experiences and observations, as well as through informal conversations with community members (Jorgenson 1989, Marshall and Rossman 1999). I often acted as a silent observer as I made my way around Tortel or even across southern Aysén, listening to how people referenced the tree or related subjects (e.g., the subject of forestry in general). I also engaged more actively in participant observation. While in Tortel or during field visits to people’s homesteads in the campo (roughly translated as “the countryside”), I opportunistically participated in informal conversations about people’s experiences with and perceptions of ciprés. In Tortel, I chatted with people on the town’s clean-up crew while sitting in the lobby of the Municipality; CONAF employees offered advice and
answered questions when I stopped by their office; I introduced my project to elected officials while grocery shopping; I talked with harvesters as we offloaded supplies from the latest barcaza; current residents who grew up elsewhere shared with me their opinions of life and times in Tortel; I asked people about the boats or structures that they were actively building; and I often swapped stories with individuals as we hiked in or out of town along the winding pasarellas. During field visits, I talked with ciprés harvesters in their homes or during walks around their properties. By engaging in participant observation with a wide segment of the local community and in a variety of settings, I was able to develop a nuanced appreciation for how ciprés is woven into the fabric of everyday life in Tortel. What I learned of ciprés in this manner informed future questions and talking points, served as the basis for my interview guide, and yielded textual data that were subject to qualitative analysis as described in a later section.

Key Informants

Three key informants participated in this study in the following ways: they helped me identify community members who were widely believed to be knowledgeable regarding ciprés; they introduced me to those individuals, as well as other members of the community; they advised me as to which sectors of the Tortel area to visit in order to sample ciprés; and they generally shared their knowledge of lives, livelihoods and “the way things work” in both Tortel and Chile more broadly. One key informant was a man who had not grown up in Tortel or Aysén, but who had been living in Tortel with his family for 10 years. He was trained as an outdoor recreation guide, had previously assisted CIEP employees and volunteered to help me with my project given an interest in the potential for ciprés habitats/stands to serve as ecotourism sites. Another key informant was a CONAF employee who was trained as a forest engineer and had been working in the Tortel area on a project with small land owners for a couple of years.
He took an interest in my project and invited me to join him on multiple fieldtrips to various sectors of the Tortel area where he helped me engage community members in conversations about ciprés. He also helped me develop an understanding for the fire history of the area. The third key informant was my landlord, a man whose father had been one of the pioneering members of the community. He himself was a “jack of all trades”. As a child and young man he harvested ciprés, but when I met him he had already been working at the high school for some time, as well as in tourism.

Semi-structured Interviews

Semi-structured interviews were employed as a method of data collection in order to generate detailed narrative accounts of how ciprés harvest fits into Tortel community members’ lives/livelihoods, whether and how they might like to see that change, and how their needs/desires can be supported. It was hoped that the process of interviewing and data analysis/compilation would allow Tortel community members to express concerns that could be compiled and shared in a meaningful way with the Tortel Municipality, CONAF, CIEP and other socio-political actors that regulate or could potentially affect ciprés harvest so as to provide direction toward positive change. Ultimately, an understanding of people’s relationships to ciprés and their interests in the continuation of those relationships speaks to whether and how ciprés can or should be managed differently.

Using semi-structured conversations with Tortel community members was also envisioned as a way to generate ideas that went beyond the researcher’s assumptions as to the nature/content of ciprés harvesters’ local/practical ecological knowledge, while fostering the collection of rich, detailed, geographically-contextual information. Eliciting ciprés harvesters’ knowledge, observations and perspectives that were particular to specific locations was not only
important for acquiring a deep and detailed understanding of the nature of the ciprés resource, but addressed the issue of whether and how the practice of harvesting ciprés was mediated by differential access to and control of the resource. That is, site-specific data may indicate differences in the quality of and access to the resource across the landscape and thus contribute to an understanding of which ciprés stands represent the “available” ciprés resource.

Snowball and purposeful sampling were used to identify participants for the semi-structured interviews (Marshall and Rossman 1999). I initially intended to identify one to three Tortel community members who were considered by their peers to be experts, or especially knowledgeable/experienced regarding the practice of harvesting ciprés. Keying in on these experts would ensure that the local/practical ecological knowledge that became documented represented that of the greatest breadth and depth available (Davis and Wagner 2003) and was thus best able to inform the other components of the research. However, as I engaged in participant observation and talked with my key informants, it became apparent that people were defining “expertise” in ciprés harvesting more in terms of the amount of experience – the length of time and breadth of geographic range over which one had engaged in the practice – than in terms of knowledge of technical details. Given that the majority of the pioneering members of the Tortel community had passed away, and that many of the adult members of the community grew up regularly harvesting wood to send to Punta Arenas and still do, there were potentially many similarly-experienced ciprés harvesters to interview. Ultimately, I decided to seek interviews with the following community members: 1) older individuals who could speak to how the practice of harvest and its role in people’s lives had changed over time; and 2) people who still engaged in ciprés harvest as a primary livelihood activity and could perhaps best address current issues of access and availability. I found these individuals opportunistically and
through snowball sampling: many of the same names came up when I asked after those individuals I should talk to about ciprés.

I completed ten digitally-recorded semi-structured interviews, and another two that were simply documented by hand-written notes per the request of the participants. I waited until my third month of residence in Tortel before I solicited and conducted interviews because I wanted to be better known to the community at large and also develop some degree of rapport with participants prior to engaging in what I hoped to be comfortable, honest, engaging conversations. Interviews lasted from 40 to 70 minutes, and took place in participants’ homes. Often, other family members were present during interviews, and in one case, husband and wife took turns answering questions. I conducted all interviews personally (though I was once accompanied by a key informant), in Spanish, and used an interview guide (see Appendix A for a copy). Almost all interviews were conducted with people between the ages of 35 and 86, most were men who identified themselves as ciprés harvesters and who split their time between Tortel and living/working in the campo, or rather on homestead sites not directly adjacent to Tortel. For the most part, I interviewed or participated in informal conversations with long-term residents of Tortel (people who would identify themselves as ‘locals’). However, I also conversed with shorter-term residents, including two forest engineers who were working with CONAF, another CONAF employee who worked in protected areas, and a development practitioner working at the Municipality. I also spoke with an individual who had once been a short-term resident of Tortel and who now resides elsewhere, working as a conservation practitioner. The following table presents a summary of the people who participated in my study:
Table 1. Summary of research participants.

<table>
<thead>
<tr>
<th>Research Participants</th>
<th>Interviews</th>
<th>Participant Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Women</td>
<td>Men</td>
</tr>
<tr>
<td>Long-term resident, harvester, campo</td>
<td>-</td>
<td>4</td>
</tr>
<tr>
<td>Long-term resident, harvester, town</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Long-term resident, harvester, town and campo</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Long-term resident, non-harvester, campo</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>Long-term resident, non-harvester, town</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Short-term resident, non-harvester, town</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Short-term resident, State employee, town</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Non-resident, NGO employee</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sub-totals</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>Totals</td>
<td>13 (one with married couple)</td>
<td>37</td>
</tr>
</tbody>
</table>

a. Research participants are classified in terms of length and place of residency in the Tortel area, and experience working with ciprés and/or other relevant occupational experience.

Digitally-recorded interviews were transcribed into written Spanish by the researcher and two professional transcribers, and then uploaded into NVivo software where they were coded in order to investigate predetermined and emergent themes related to the primary research questions driving this investigation. Care has been taken to maintain the anonymity of all research participants throughout the data collection, analysis and result-reporting stages of the research process.

Local Historical Texts

Two historical accounts of the Tortel area provided insight for my research: “Lucas Bridges: El Señor del Baker” (Wellman 2004), and “De la Extracción del Ciprés a la Creación de un Pueblo” (Astorga and Uribe 2009). The first, produced by a woman who was born and raised in Aysén, served only as a source of historical information. However, details included in her account of the colonization of the Baker River allowed me to develop a holistic understanding of the development of the Tortel area and the role of ciprés in that process. Astorga and Uribe’s text served as primary source material. These two young women arrived in Tortel for short-term projects, but ended up settling in town. Their book is organized around
interviews with some of Tortel’s elders regarding ciprés, their life experiences and the
development of Tortel.

*Content and Discourse Analysis*

Analysis of data from participant observation, semi-structured interviews and historical
texts was based on the desire to explore answers to three primary sets of questions relevant to the
livelihood context of ciprés harvest in Tortel. The first set was meant to reveal the local/practical
ecological knowledge held by community members. What is the current distribution of ciprés
across the landscape and how has this changed over time? What do harvesters know about the
relationships between habitat characteristics (e.g., soil type, hydrology, associated vegetation)
and the presence and abundance of different size classes/ages of ciprés? What observations are
made of how harvest intensity impacts habitat and/or the natural regeneration of the species?
What do people know about the fire history of the Tortel area and its effects on the landscape?

The second set of questions is concerned with the process of engaging in ciprés harvest
and how Tortel community members depend on ciprés for their livelihoods. How is the practice
of ciprés harvest negotiated between socio-political actors (i.e., what competing interests exist,
what scales are implicated in the process, and in what ways do actors interact and make
decisions)? What difficulties arise in the processes of acquiring access to ciprés and then selling
wood or value-added products, and how can they be overcome? How important is ciprés harvest
compared to other income-generating activities and how/why has the importance changed over
time? Finally, the third set of questions pertains to how Tortel residents value ciprés as part of
their lives. Do harvesters think of ciprés in primarily economic terms, or does the tree hold
special social/cultural relevance as well? Is ciprés conceptualized as a component of the
ecosystem? Have the meanings ascribed to ciprés shifted over time?
All three sets of questions were investigated using qualitative data analysis to code texts according to major themes (following Marshall and Rossman 1999); however, the third set of questions was subject to a more discursive angle of analysis (Phillips and Hardy 2002). Interpretive methods of analysis, including discourse analysis, allow a researcher to iteratively analyze texts for emphasized or recurring themes, inconsistencies, and material that has not been included (Bosak 2006). I used the process of coding to break down textual data into major themes pertaining to local/practical ecological knowledge, the current and historic role of ciprés in people’s lives/livelihoods, and issues of access/availability of the resource. Textual material corresponding to each theme was then further broken down or coded based on more-detailed ideas that emerged repetitively or added new responses to the questions detailed above. This process was aided by the software program NVivo.

In contrast, I used discourse analysis to get at the subtext underlying what people chose to tell me or what was written about ciprés in order to understand what ciprés means to Tortel community members or the ways in which it is valued. I also investigated the meanings ascribed to the natural world more generally and whether ciprés was included in thoughts/perceptions of nature. Discourse analysis is based on the premise that words – language – create meanings that construct the material world (Bosak 2006). By examining the specific words used to discuss ciprés and analyzing them in light of the broader context of lives/livelihoods in Tortel, I was able to get at the ways in which ciprés and the practice of ciprés harvest is socially constructed by Tortel community members (Phillips and Hardy 2002).
Research Question 5: How is ciprés conceptualized at national and international scales of forest management and conservation and what are the implications for ciprés harvest in the Tortel comuna?

I also used discourse analysis to uncover how various international or national governmental agreements or policies ascribe meaning to the environment or specific components of the natural world in order to determine whether they are compatible with the perspectives of ciprés held by local people who harvest or otherwise utilize the tree. Though policies that regulate ciprés use may exist across a spectrum of scales from the global to the municipal, I chose to focus my analysis on the global and national levels. This follows from assertions made in the Literature Review regarding the power of the State when it comes to land management decisions, as well as the effects of international conservation mandates on such decisions.

Regarding ciprés, it is also true that the tree has primarily been the focus of Chile’s forestry sector, which is regulated by national policies, institutions and programs. Finally, while pressures for economic growth and development at the regional level (i.e., within Aysén) are very strong and could have substantial impacts on ciprés use, scales of governmental policies do appear to operate hierarchically. For example, changes to forest management at more local scales must be consistent with policies that originate at more-encompassing scales.

Getting at the discourses that underlie international and national agreements/policies and drive ciprés management was difficult because there are many documents that are potentially relevant to ciprés conservation and management (see Table 2), and yet few documents are rich in details regarding the tree. That is, ciprés is perhaps included in a list of species or forest types, but it is never the subject of extended discussion. In some cases, ciprés is never explicitly
mentioned, but discourse analysis reveals how a particular agreement/policy implicitly applies to
the tree given its attention to biodiversity, forestry and/or national heritage. In order to complete
my analysis, I found that I needed to draw upon multiple policy texts per policy scale, as well as
background material regarding those documents and/or policy critiques completed by other
authors. During analysis, I strove to answer the following questions regarding ciprés or non-
human nature more generally: How are they defined? What assertions are made regarding their
value or meaning? What scales are implicated in this valuation? Is a connection drawn to local
livelihoods?

Table 2. International and national agreements/policies relevant to ciprés management/use. (*) Denotes texts
subject to discourse analysis.

<table>
<thead>
<tr>
<th>Year</th>
<th>Agreement/Policy</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>1931</td>
<td>Forest Law</td>
<td>Chile’s first substantial forest law; its primary goal was to protect water and soil resources.</td>
</tr>
<tr>
<td>1967</td>
<td>Convention of Washington</td>
<td>Provided the impetus for the formation of Chile’s protected areas system.</td>
</tr>
<tr>
<td>1974</td>
<td>Forest Law 701*</td>
<td>Substantial amendments to the 1st Forest law; established the need for management plans; encouraged the creation of plantations.</td>
</tr>
<tr>
<td>1975</td>
<td>CITES*</td>
<td>Alerce, araucaria and ciprés restricted from international trade.</td>
</tr>
<tr>
<td>1980</td>
<td>Supreme Decree 259*</td>
<td>Amendment to Forest Law 701; forest types defined.</td>
</tr>
<tr>
<td>1992</td>
<td>Supreme Decree 87*</td>
<td>Adjustment to Forest Law 701 and DS 259; determined harvest method allowed per forest type</td>
</tr>
<tr>
<td>1994</td>
<td>Convention on Biological Diversity</td>
<td>Provided the impetus for the development of Chile’s environmental policy.</td>
</tr>
<tr>
<td>1994</td>
<td>Environmental Framework Law 19.300*</td>
<td>Established Chile’s environmental policy, process of environmental review, and CONAMA.</td>
</tr>
<tr>
<td>1997</td>
<td>IUCN Red List of Threatened Species</td>
<td>Ciprés listed as ‘vulnerable’ within this global environmental policy tool.</td>
</tr>
<tr>
<td>1998</td>
<td>Law 19.561</td>
<td>Amendment to Forest Law 701; mandates CONAF’s enforcement of management plans.</td>
</tr>
<tr>
<td>2001</td>
<td>Declaration 00282 *</td>
<td>Zona Típica status awarded to Caleta Tortel.</td>
</tr>
<tr>
<td>2005</td>
<td>Supreme Decree 75</td>
<td>Established rules for classifying wild species (as stated in Article 37 of 19.300).</td>
</tr>
<tr>
<td>2008</td>
<td>Native Forest Law 20.283 *</td>
<td>Establishes norms for the conservation and management of Chile’s native forests.</td>
</tr>
</tbody>
</table>
A Note Regarding Project Scope and Limitations

The overarching goal of this project is to form a basis for the holistic understanding of the practice of harvesting ciprés. Thus, the project calls for the participation and input of Tortel community members as well as the implementation of a scientific forest inventory. While the project is designed such that different ways of knowing/perceiving inform each other and/or add depth and detail that can better form a picture of ciprés harvest, this project does not provide a comprehensive understanding of the practice due to a number of reasons. For one, my ability to engage in participant observation was limited by my roles as a non-local and a foreigner. The places, people and ideas that I was privy to must all be understood to have been affected by those roles. In addition, my interpretations of people’s behaviors and words were subject not only to my expectations and assumptions, but they were filtered through my translations from Spanish to English. The conclusions drawn from this research are potentially limited by the small number of interview participants whose perspectives and opinions may not reflect those held by all Tortel community members. My conclusions are also limited by my inability to draw explicit causal links between changes in local conditions (i.e., the distribution, abundance and quality of the remaining ciprés) and socio-political factors. Finally, the scope of application of this research is limited by its nature as a case study, though the guiding methodology and ultimate synthesis of results may inform similar studies that seek to apply a scale-sensitive political ecology lens to rural, resource-dependent livelihoods in the Global South.
CHAPTER 5: RESULTS

In this chapter, I discuss the results of my fieldwork and data analysis. The chapter is divided into sections based on the primary context under investigation. Figure 2 depicts how the various pieces of the research fit together. In the Biophysical Context section, I examine the local conditions in which ciprés harvest takes place and draw on local knowledge in order to characterize the remaining ciprés resource. In the Livelihood Context section, I examine the perspectives and opinions of research participants in order to understand the current role of ciprés in their lives/livelihoods and how this has changed over time. Finally, in the Conservation and Management context section, I analyze the discourses of the environment and its constituents that drive various policy scales in order to determine whether and how these might affect the local conditions and local people of the Tortel area. While I conclude each section of the Results chapter with a summary, synthesis of the three contexts and their implications for ciprés use by Tortel community members is reserved for the Discussion & Conclusions chapter.

Figure 3. Overview of the various methods of data collection and analysis used to generate an understanding of the roles and availability of ciprés in the Tortel area.
Biophysical Context

In this section, I will address the following research questions: 1) What is the distribution, abundance and quality of ciprés in the Tortel vicinity? 2) What local/practical ecological knowledge is held by Tortel community members who have been or are currently engaged in the practice of harvesting ciprés? Following Fabricius et al. 2006, I recognize local knowledge as a source of both “fine-grained, detailed information about local ecosystem services” and “often the only source of information about past patterns of ecosystem use, past land use, traditional customs, and the history of local politics. . . .” (p. 170). Furthermore, I assert that any understanding of ciprés as a resource must take into account local perspectives and knowledge. Thus, the ultimate goal of this section is a synthesis of the observations I made while ground-truthing ciprés habitats and harvest sites with the observations/interpretations of ciprés distribution, abundance and quality shared with me by Tortel community members. I briefly report the most significant observations I made while ground-truthing ciprés sites. Then I discuss the local/practical knowledge held by Tortel community members as revealed through participant observation and semi-structured interviews. Finally, I present a “qualitative synthesis” based on the above results.

Ground-truthing Observations

My ecological observations of ciprés that are most relevant to the overall goal of this investigation – getting at the factors that affect the availability of ciprés for human use (currently and in the future) – are as follows: the nature of the habitats in which the tree is found, and the types of anthropogenic effects that continue to affect the distribution and abundance of the tree.
Ciprés is managed as a forestry species. While it is true that the tree is a constituent of various forest types and sometimes a dominant on upland soils (i.e., mineral soils vs. organic soils), ciprés also frequently occurs in peatlands (or ‘bogs’, which can be used as a generic term). Peatlands are a type of wetland that can be distinguished from other landscape units by the presence of organic soils (i.e., peat), a saturated surface, relatively low oxygen content and high acidity. The combination of aquatic and terrestrial conditions found in peatlands makes these unique and dynamic ecosystems that are sensitive to environmental change (Charman 2002). Many intertwined abiotic and biotic properties contribute to the structure and function of peatlands, including the composition of the floristic community, vegetation physiognomy, morphology, hydrology, stratigraphy, chemistry and peat characteristics (e.g., composition at various depths) (Charman, 2002, citing Moore, 1984b). As a result, these systems may be more sensitive to management activities, such as ciprés harvest, than the upland sites in which ciprés is also found.

Ciprés habitats in the Tortel area differ not only in terms of their ecological properties, but also in terms of the degree to which they have been altered by humans. Burning, grazing, ditching and/or harvest have affected nearly all sites that contain ciprés in the Tortel area. (In fact, only two old-growth stands of ciprés are thought to exist; Andrés Holz and Jan Bannister pers. comm.) Fire has passed through the area on large geographic and temporal scales. According to Holz (2009), fire was probably used by indigenous people to open forests in the fjords and lower river valleys. Using fire scars from ciprés trees in the Tortel area, he found evidence of fire to be relatively common as early as 1559. Holz’s dissertation research also found a significant increase in the number of fires following Euro-Chilean colonization, but especially between 1950 and 1970, which he attributes to increased human ignitions coupled
with climate warming (and local drought conditions). Most ciprés stands in the Tortel area have been affected by multiple widespread fires and/or localized burns. Fire had been regularly used for the purposes of clearing forests to create pasture and/or facilitate ciprés harvest until CONAF started regulating that activity in the 1980s. People have also used ditches to drain peatlands for the above resource uses. Ultimately, the current state of any specific site containing ciprés has been produced through a combination of ecological processes (e.g., peat formation or patterns of ecological succession) and anthropogenic activities that are difficult to entangle. The cumulative effects of these processes are evident as one travels across the landscape, which is composed of a mosaic of stands of vegetation in different stages of regrowth, including trees (or even ciprés snags) that clearly represent different age cohorts. Changes in the structure and function of ciprés habitats due to cumulative effects may include a diminished capacity for ciprés regeneration and the potential for the sustained use of the species. The images in Figure 4 capture some of the variety of successional stages and anthropogenic manipulations of ciprés stands across the Tortel area.
Local/Practical Ecological Knowledge

In this section, I report on the character and content of the local/practical ecological knowledge held by Tortel community members. As discussed in the Methods chapter, I analyzed the content of texts resulting from participant observation and semi-structured interviews in order to explore this topic. I assume local/practical ecological knowledge to represent a mixture of observations and interpretations about the natural world that stem from regular engagement with its constituents (Ballard and Sarathy 2008). That is, ‘practice’ is the essential mechanism that links people to nature and gives them the opportunity to develop ecological awareness. Local/practical ecological knowledge may be seen to include different levels of understanding about the phenomena being observed: from more practical or superficial
to more nuanced. This follows from Berkes’ (1999) ‘levels of traditional ecological knowledge’, which include “immediate empirical knowledge and taxonomies of plants, animals and soils” but also “knowledge of functional relationships and processes, like ecological succession” (reported by Robbins 2004, p. 118).

In the case of ciprés harvest by Tortel community members, I was particularly interested in whether this practice has lent itself to observations/interpretations that fall more on the ecological, rather than practical, end of the spectrum. That is, I wanted to know whether people assert knowledge of functional relationships between ciprés and its habitats (e.g., do they note the effects of human activities on these systems), even though they engage primarily with dead trees (and even though this system of resource use has only been in place for 70 years). I also sought to get at the “more practical” details of Tortel community members’ observations or interpretations of ciprés ecology – those related to the tree’s use as a resource. In the rest of this section, I first summarize the character and content of people’s local/practical ecological knowledge. Then I focus on how Tortel community members conceive of and describe ciprés distribution, abundance and quality.

Character and Content

In general, research participants shared many details with me about the processes of extracting, elaborating and selling ciprés wood (i.e., the “practical” aspects of ciprés harvest/use). In contrast, research participants expressed relatively few details regarding ciprés ecology unless I specifically solicited their observations or interpretations. Some details of ciprés biology/ecology were completely unknown to Tortel community members. For example, people were surprised to learn that there are male and female ciprés trees (given that the species is dioecious). This kind of information was received with interest, and several individuals
expressed the desire to learn other details of ciprés biology, for example, the average growth rate and lifespan of the tree species.

Multiple individuals told me that knowledge of ciprés harvest/use is highly valued: people take pride in their ability to extract and make wood products from ciprés, and they judge others by these abilities. In fact, when comparing themselves to others (including forest engineers from CONAF and me) research participants recognized their practical knowledge as something special and important. People also expressed pride in their knowledge of river features and hydraulics and their capacity to use that knowledge to safely navigate to and from harvest sites. Others mentioned their ability to “eyeball” tree trunks and gauge the quantity of board feet they could yield.

Regarding the practice of ciprés harvest, research participants generally told me about where they harvest ciprés, the characteristics of the material that they extract, and the skills involved in that process. For example, people told me how they determine whether a ciprés trunk is rotten, and how they select specific individuals to harvest based on the utility of different diameter size classes and other structural characteristics that make good products (i.e., for postes, wood crafts, or carpentry and construction projects). I was also told how many trunks research participants could harvest, trim and subsequently extract given the terrain in which they were working; and I learned of the variety of tools and techniques that are involved in those processes. Harvesters access ciprés by walking across forests and bogs, rowing or motoring up and down rivers, creeks and lakes, or riding horses. They cut and shape smaller trunks at harvest sites using axes and chainsaws. They extract raw logs or shaped products (i.e., postes) by “shouldering” them out of harvest sites on paths built from small-diameter logs, pulling them by horse or oxen, sliding them down inclines and dragging them into boats, or assembling them into
rafts. Once larger logs are removed from harvest sites, they are further elaborated (e.g., into beams or boards) using chainsaws or mobile saw mills (though only a few individuals in the Tortel community actually own the latter tool).

I pursued research participants’ “more ecological” knowledge by asking general and specific questions about the natural world or ciprés (see the interview guide in Appendix A). Often I tried to get at observations that were particular to a specific geographic location. People made observations of large-scale changes in the environment, such as differences in weather patterns over time, or changes in the depth or pathways of water courses. They also made observations of smaller-scale components of the environment, such as the presence of animals and plants. A couple of individuals mentioned how the abundance of various types of fish or birds had changed over time; one suggested that a non-native predator was responsible for decreasing numbers of native waterfowl along a particular reach of the Baker River. As for vegetation, people often referenced common species of trees, shrubs, and graminoids. A couple of people noted species of plants that were edible or useful in other ways (e.g., natural wool dyes). When asked, people would tell me how the composition and/or distribution of vegetation across their land had changed over time. Sometimes people simply told me that there were more or less individuals of a certain species than before. Other times, people referenced processes of succession or competition to explain why changes had taken place. In general, research participants seemed to make the most nuanced observations about peat growth and they related changes in peat depth or moisture to the effects of fire, harvest and/or season.

Tortel community members were adamant that they only harvested ciprés seco (dry or dead ciprés), and many were reluctant to talk with me about fire. However, they were willing to talk to me about ciprés verde (live ciprés). While people appeared to humor my questions about
whether and where I could find mature individuals, they were most eager to discuss ciprés regeneration. People shared with me their ideas regarding trends in the locations of seedlings and saplings, the largest ciprés individuals, and rotten patches of ciprés snags. This subject of the distribution, abundance and quality of ciprés seems to represent the heart of Tortel community members’ local/practical ecological knowledge. In the synthesis section below, I examine people’s specific observations and interpretations and what they suggest about the ciprés resource and how it has changed over time.

**Qualitative Synthesis**

When I first arrived in the Tortel area and began to investigate ciprés distribution and abundance, I saw ciprés everywhere: grey-white snags with pointed crowns stood out against red peat bogs and green slopes. It was only while conversing with local people that I began to understand that only a subset of the standing dead trunks were available or suitable for harvest and thus counted as part of the ciprés resource base.

Tortel community members primarily described the availability of the ciprés resource to me in terms of the distribution and abundance of standing dead ciprés trunks at the scale of the *sector*. Sectors refer to geographic areas – usually referenced in terms of prominent landscape features, such as rivers and glaciers – where members of the Tortel community historically built homestead sites or otherwise congregated due to a high concentration of readily-accessible ciprés trunks. Today, these are the primary regions of the Tortel area in which people still live and/or harvest ciprés. People identify themselves and orient others in terms of seven major sectors of the Tortel area: Lower Baker, Vargas Lake, Bravo River, Quetru Lake, Pascua River, Montt Glacier, and Steffens Glacier (see Figure 5). Each sector represents a mosaic of private properties (though there are some scattered fiscal lands) and land cover types. Though each
sector includes a variety of ciprés habitats (i.e., various forests and types of peatlands), it is worth noting that bogs primarily occur in wide, flat river valleys that were once glaciated. Thus, ciprés bogs tend to characterize the harvest sites of the Baker, Bravo and Pascua sectors, while people primarily harvest on hillslopes and upland sites in the Quetru and Steffens sectors.

Figure 5. Map of the Tortel area. Circles loosely represent sectors, or areas in which Tortel community members have traditionally lived and/or harvested ciprés. Boundaries not discreet. From North to South, the sectors are as follows: Steffens Glacier, Vargas Lake, Baker River, Bravo River, Quetru Lake, Pascua River, and Montt Glacier. The Huemul, Baker, Bravo and Pascua Rivers (North to South) are depicted in darker blue. The Southern Highway is depicted using brown dashes.

According to all research participants, viable ciprés is now scarce. The term ‘viable’ is used somewhat loosely. In general, people have sought ciprés trunks of certain lengths and diameter size classes depending on the use of the wood. For postes (fence posts that have been regularly shipped to Punta Arenas since the mid-1950s), the associated diameters have changed over time. Today, ciprés trunks of 2.10 to 2.20m in length and 8-12cm in diameter at breast height (dbh) are harvested and trimmed to make postes. It seems that over time, a combination
of factors have determined poste specifications. In the early days, people harvested by axe, thus targeting smaller-diameter ciprés trunks. When these became scarce, people turned to larger-diameter trunks. Eventually, the chainsaw replaced the axe and people could harvest large trunks with ease and trim these to “poste size”. In addition, changing demands from the estancias in the Magallanes Region of Chile, as well as Argentine Tierra del Fuego may have altered the nature of the ciprés trunks that were harvested. Today, in addition to postes, people typically harvest rollizos of 30cm dbh and 3.20m in length, which are sawn into lumber.

The notion of ciprés quality also figures into an assessment of the ‘viable’ resource. While fire was used to clear other vegetation and kill live ciprés trees that would subsequently “dry” into a useful state for harvest, not every ciprés tree was left in a usable condition. That is, a given stand of ciprés snags contains some percentage of trunks that are too burned to serve as wood products. In addition, despite the longevity of ciprés wood, some snags have been in place for more than 60 years and have begun to rot. One research participant told me that about 40% of the standing dead trunks on his property are rotten.

‘Viable’ also includes the notion of physical accessibility. Prior to 1980, Tortel community members throughout the zona depended exclusively on the long-distance transport of wood and wood products via waterways. For example, research participants in the Vargas Lake sector used to spend two days rowing ciprés rafts down to Tortel and then four days rowing back upstream. The arrival of motorboats significantly affected the ease with which people could access and move ciprés. The same is true of the Southern Highway, which opened access to new harvest sites and even entire sectors (e.g., to sector Bravo in 2001 and Tortel proper in 2003).

When I asked research participants about where viable ciprés still exists, many people’s first response was to tell me that there is practically none left. One individual said,

Porque ya la cantidad no da más. Que Ud. piense

There is no more quantity. You think that there are
que hay cantidades de madera, no, no, no. En todo campo quedaron como reserva por lo lejos que están, y son pocos los cipreses que quedan. Lo que hay harta todavía es varilla -- maderita como para hacer postesitos de tres pulgadas, dos pulgadas. . . . De eso hay. En todos campos hay mucho. (P09)

With a little more probing, people would share with me their assessments of the ciprés resource by sector. In general, I was told that there is still harto ("plenty of") ciprés in the Quetru, Pascua, and Steffens sectors, and that the ciprés trunks in those areas are mainly rollizos. In contrast, relatively little ciprés of desirable dimension remains in the Baker, Bravo and Montt areas, and virtually no resource is left in the vicinity of Vargas Lake. Overall, it appears that differences in the amount of standing dead ciprés remaining in a sector has to do with the following factors: the stand structure of ciprés (i.e., the number of individuals of various size classes) when people first began to harvest (and burn), how long people have been harvesting in the sector and the number of people working ciprés over that period of time, whether livestock raising was a viable alternate livelihood option, and the isolation of that sector from points of embarkation in the fjords, or more recently, the Southern Highway.

At the scale of individual ciprés sites, I learned the following details regarding land use history: when a research participant’s family first settled at that site and began to harvest ciprés, or when alterations, such as ditches, were made. I was only given vague details about when fire had last affected the area (but Holz’s [2009] work offers insight into the fire history of specific sites). While talking with people in town, it was difficult to get at more specific and spatially explicit details regarding the location, abundance and quality of ciprés. I was not able to make as many guided field trips on people’s properties as I had been intending. Research participants generally told me that individual sites of ciprés harvest have changed in that the viable snags are now 3km or more from points of access (i.e., waterways or roads). My own reconnaissance
corroborates these observations. Figure 6 is a visual representation of how the distribution of the ciprés resource has shifted over time and space.

![Figure 6. Visual representation of how the distribution of the ciprés resource (green circles, boundaries not discreet) has shifted over time in the Vargas Lake and Baker River sectors. The Southern Highway is depicted in brown. Black and white aerial photos taken in 1998 by Servicio Aerofotométrico de la Fuerza Aérea de Chile.](image)

Ciprés harvest sites are a patchwork of areas that were once heavily harvested by axe but revisited later with chainsaws; they are crisscrossed with constructed tracks and depressions from trampling. In peatland habitats, I also noticed a marked increase in the quantity and diversity of different species of plants as I got farther from points of access (about 2km) and towards large remaining patches of ciprés snags. This observation hints at the effects of harvest on the structure and function of these sites. Finally, my ground-truthing of ciprés sites during two float trips on the Baker River revealed that people are currently using smaller drainages to access and harvest ciprés bogs that do not fall within the seven primary sectors. This may be a reflection of the decrease in the viability of ciprés remaining in those sectors and the need to tap into areas that had previously been considered less desirable.
In summary, the Tortel area can be seen to be a mosaic of landscape features and land cover types subject to mixed fire effects. Understanding the distribution, abundance and quality of ciprés requires an appreciation for the different habitat types in which it occurs: forested peatlands should be distinguished from forests located on mineral soils. Other factors that have affected the remaining ciprés resource include patterns of human access and use, which have changed over time. These have affected ciprés distribution and abundance on large and small scales. In thinking about the geographical extent of ciprés harvest on a large scale, one can see that people have expanded their search for the resource over time, moving further away from the sectors in which ciprés was once abundant and readily-accessible, even out into the fjords. At specific sites of ciprés harvest, one can imagine distinct waves of anthropogenic effects that have moved inward on the resource from rivers and roads, leaving patches that differ in resource and habitat quality in their wake.

Livelihood Context

In this section, I draw upon the perspectives, experiences and observations that Tortel community members shared with me through participant observation and semi-structured interviews to address the following research questions: 1) What significance does the practice of ciprés harvest have for the lives and livelihoods of Tortel community members, and how has it changed over time? 2) What are Tortel community members’ perceptions of the barriers to the harvest of dead ciprés and how they can be overcome?

The first question is really the driving question of this study. All research participants’ comments regarding their lives – whether pertaining to the process of carving a ciprés poste (fence post) by axe, the monetary value of a board foot of a certain tree species, or the history of land use of a particular sector – relate in some way to the role of ciprés in lives/livelihoods in
Tortel. As I iteratively sorted and coded the data from participant observation and semi-structured interviews, two major themes emerged: ciprés as a material component of people’s lives, and ciprés as a socio-cultural component of people’s lives. However, also woven throughout participants’ narratives was the notion of change. Exploring this third theme revealed answers to the second research question: some of the ways in which Tortel has changed (e.g., the increasing scarcity of usable and accessible ciprés, the presence of CONAF, or the opportunity to engage in tourism) have altered people’s capacity and desire to incorporate ciprés into their livelihoods. Given that the economic and subsistence roles of ciprés are tied to its socio-cultural roles via the practices of harvest and commercialization, these latter roles have also changed in some ways.

From the major themes (i.e., material role, socio-cultural role and changing role of ciprés in lives/livelihoods), I derived subthemes by either categorizing people’s statements at their face value, or making interpretations based on how people talked about various subjects. For example, I noted whether people displayed enthusiasm or pride, or expected certain reactions from me (e.g., awe at the difficulty of early life in the Tortel area and the feats of the pioneering residents). I also thought about individual comments in light of the conversation in which they were couched, as well as the greater context of interactions between myself and the research participant. Interpreting people’s observations, perspectives and opinions as described above was especially important for getting at the more subtle socio-cultural roles of ciprés (i.e., the significance and meaning of the tree species).

In reporting the results for this section, I have integrated material from historical texts. These material validated details shared by research participants (e.g., dates, locations, events and involved parties) and filled gaps so as to generate a holistic understanding of how ciprés fits,
both historically and contemporarily, into the lives and livelihoods of Tortel community members. In many senses, the story of Tortel is the story of ciprés, and vice versa. Due to this link, I have tried to interlace the colonization of the area and the founding and development of Tortel into my results. However, it should be noted that other authors have told this tale (see Hargreaves 2005, Astorga and Uribe 2008). My primary goal has been to parse this story into the different types of relevance and meaning associated with the tree species. I have done this while recognizing that imposing categories is artificial in the sense that the use of ciprés and its significance/meaning are interrelated. Ultimately, an examination of people’s relationships to ciprés and their interests in the continuation of those relationships speaks to whether and how ciprés can or should remain an important part of their lives/livelihoods.

Before continuing with this section, I want to note some of the decisions that were made regarding my translations, particularly the use of vernacular terms. I have included both Spanish and English versions of material quoted from semi-structured interviews. In order to convey my interpretation of interview participants’ narratives in English and maintain a written flow, I did not always translate material verbatim. In some instances I left out redundant words or fixed grammar. Other times, I replaced words, as indicated in brackets. Also, sometimes I chose to include only the vernacular Spanish version of a word. I did this because the meanings of some words are embedded in the culture of the Tortel area, especially those related to the practice of working with ciprés wood. I will discuss some of these terms below.

Research participants frequently used the term *zona* to refer collectively to the regions of the Baker, Bravo and Pascua drainages and other nearby geographic areas (e.g., the Steffens Glacier) where they, their extended family or their ancestors live or have lived and harvested ciprés. I have followed suit. It should be noted that when research participants speak of
harvesting or otherwise using ciprés, they are referring to dead trees unless otherwise specified. *Madera* is a complicated term. The direct translation is “wood”. While Tortel community members do use this word generically to refer to all wood types, most often *madera* refers specifically to ciprés wood. Likewise, verbs such as *hacer madera* or *maderear* (both of which roughly translate as “to do/make wood”) most often refer to the practice of harvesting ciprés, but are more encompassing than the simple extraction of trees, as will be illustrated later in this section. It is significant that most individuals do not use the verb *cortar* (“to cut”) when talking about gathering ciprés wood. Finally, the *campo* is also a term with multiple meanings. English translations include “countryside”, “field” and “farm”. In Chile, in general, *campo* is used to refer to a geographical region that is “rural”. Around Tortel, people also use *campo* to refer to their “land” or, what I call the “homestead sites” on which they reside.

**Material role of ciprés in lives/livelihoods**

The primary role of ciprés in Tortel community members’ lives is that of a livelihood resource. Ciprés has served as the economic mainstay of most households at one time or another, and still provides much of the raw material for cooking and heating as well as the construction of personal and public infrastructure. While people attribute the colonization of the *zona* and the foundation of Tortel to the above uses of ciprés, and though ciprés wood is cited as the principal source of trade or cash income, the harvest and sale of the tree species is almost universally regarded as an activity that provides marginal economic returns and that is practiced under marginal circumstances. These results will be described in more detail below.

Ciprés, as an economic and subsistence resource, has figured prominently in the history of Caleta Tortel and the surrounding area. According to research participants, and supported by historical accounts of southern Aysén (Wellmann 2003 and 2004, Astorga and Uribe 2008),
ciprés harvest in the Baker River drainage was initiated by La Compañía Explotadora del Baker or ‘Baker Exploitation Company’ in the early 1900s⁴. Though the Company was dedicated to livestock-raising, the extraction and sale of ciprés wood was undertaken to finance initial operations and capital accumulation (Wellmann 2004)⁴. While the difficulty of local conditions prevented the permanent establishment of any large-scale business ventures, even after 30 years of effort (Wellmann 2004), pioneering individuals and their descendants managed to eke out a living in the zona, primarily by subsisting off of ciprés.

The harvest and use of ciprés for household consumption began in the late 1930s as men who had worked for La Sociedad Estancias y Posadas, Hobbs & Compañía in Valle Chacabuco (which was one of the later incarnations of the Company) began to disperse south along the Baker River in order to establish their own homesteads and raise families (Wellmann 2004, Hargreaves 2005). They were joined by individuals from other parts of Chile or those returning from Argentina following repatriation. When I asked what brought them or their ancestors to the area, research participants generally told me that they came from further north (e.g., La Isla Grande de Chiloé, Coyhaique, Chile Chico or Temuco) and that they arrived for the following reasons: to acquire their own land, to raise animals, and/or to harvest ciprés. One interview participant recounted,

Mi viejo viene de Chiloé, de muy joven. Normal que salían de muy joven los muchachos de sus tierras y se lanzaban a trabajar por la Argentina, otros directamente buscando campo y por ahí llegó. Estuvo una etapa trabajando . . . se tiraban a buscar tierras para tener algo propio. Acá estaba

My old man came from Chiloé when he was very young. It was normal for men to leave their homelands very young and to work or look for land immediately, via Argentina. He worked for a time and then left it to look for land in order to have something of his own. Here was the opportunity.

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3 The Baker River was not explored until 1898. The Company began its operations in 1901, and its employees represented the first consistent non-indigenous presence (Wellmann 2003).
4The links between ciprés and the Company’s activities in the zona have not been well-developed in the literature. However, it is telling that both Wellmann and research participants mentioned the tendency of the Company to employ individuals from La Isla Grande de Chiloé. These so-called “men of the axe” were skilled wood-workers and familiar with timber extraction in remote, harsh environments. It is likely that many individuals had previous experience working with ciprés on Chiloé or in the Guaitecas and Chonos archipelagos.
la oportunidad. Acá los terrenos no eran buenos para ganado pero sí vieron que se podía ganar la vida con el ciprés. Pero sí el sacrificio era harto (P05).

Here the terrain wasn’t good for livestock, but one could make a living with ciprés. But, yes, the sacrifice was substantial (P05).

In the early days of settlement, the contribution of ciprés to livelihoods was enormous because there was no other viable option. Most interview participants spoke to me of the marginal environmental and economic conditions of the area. Though they or their families came searching for land on which to practice agropastoralism, they found that extensive bogs or dense forests covered much of the flat terrain, and so turned to ciprés harvest out of necessity:

Había que buscar campo que tenga madera porque aquí no se podía vivir de otra manera. La gente llevó su animalitos, pero fíjase en ese tiempo cuanto demoraba para llegar con un par de animales a Tortel (P09).

One had to look for land that had wood [i.e., ciprés wood] because here one couldn’t live any other way. People brought their animals, but consider how much time it would take in those days to arrive to Tortel with a couple of animals (P09).

The above quote alludes to the extreme distances that people had to traverse in order to access and explore the zona. Though travel between southern Aysén and the rest of Chile was difficult enough, travel within and between the Baker, Bravo and Pascua drainages and even more remote locales was made more challenging by the ruggedness of the terrain, absence of roads, high density of forests, powerful rivers, and expansive fjords. Despite these challenges, the material value of ciprés impelled people to establish or re-establish homesteads wherever they encountered the tree species, even if that meant 30 days of travel to reach the nearest supplies or required the transport of infrastructure, livestock and family members across 90 km of fjords via row boat. As one interview participant explained, not only did ciprés draw people to southern Chile, ciprés presence dictated settlement patterns on a fine scale:

Bueno, normalmente los viejos buscaban un campo que tenga ciprés y de ahí decían “yo voy a trabajar ahí” y se inscribían en la capitania del puerto. . . y se empezaban a trabajar. Una casa levantaban y empezaban a explotar el ciprés porque era más por eso -- igual llevaban sus animalitos -- pero era más por explotar el ciprés. . . Mi viejo estuvo por

Well, normally our forefathers would look for a homestead site that had ciprés and they would say, “I’m going to work there” and they would inscribe it with the port captain. They would raise a house and begin to exploit ciprés because it was mostly for that – they also brought their animals – but it was more to exploit ciprés [that they chose a site].
Estefen primero. Por ahí partieron... Y de ahí lo trasladamos al Pascua. Así eran casi todos los que entraron. Fueron muy pocos los que llegaron y se quedaron en una sola parte. Porque eran decididos, no les costaba nada dejar botado su trabajo e irse a otro lado donde les parecía mejor para trabajar. Muchas veces porque tenía más ciprés y estaba la oportunidad para hacerlo. Así se empezó el sector de Pascua. Había mucho ciprés. Como que seguían los campos que tenían más ciprés y si tenían la oportunidad de meterse ahí se quedaban (P05).

My father was in Steffens first. They left [northern Chile] for [that sector] and we moved from there to the Pascua. It was this way for almost everyone that entered [the zona]. It was very few that arrived and stayed in only one part. Because they were determined, it didn’t cost them anything to toss aside their work to go to another area that looked better for working – many times because there was more ciprés and the opportunity to do it. That’s how sector Pascua began. There was a lot of ciprés. They pursued homestead sites that had the most ciprés and if they had the opportunity to involve themselves they stayed (P05).

Though initially people wound up harvesting ciprés in order to survive, eventually individuals journeyed to the Tortel zona with the express purpose of working in ciprés. In part, this was because a system was established whereby families in the distinct sectors collectively amassed ciprés posts and sent them to Punta Arenas where they were bought by large land owners\(^5\). Through an intermediary, the posts were exchanged for cash and/or traded for supplies. Thus, ciprés harvesters began to have regular access to a market, and lives were made slightly easier by the arrival – every three to four months – of food stuffs and material goods. At first, the Chilean Navy facilitated the transport of the posts and supplies through a business arrangement with the Asociación de Ganaderos de Magallanes (‘Association of Livestock Workers of Magallanes [currently Chile’s Region XII]’; Astorga and Uribe 2008)\(^6\). Later, the Navy offered transport as a State-sponsored service in recognition of the presence of the remote community of settlers. In fact, the establishment of a permanent Navy post in 1955 catalyzed the formation of the town now known as Caleta Tortel (Astorga and Uribe 2008).

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\(^5\) Generally these were extensive estancias, or ranches, that participated in the livestock industry, but apparently the Guarelo mine was also a significant buyer of ciprés posts at one time (Astorga and Uribe 2008).

\(^6\) It is not known how this process was initiated, however it seems likely that members of the Association of Livestock Workers of Magallanes were connected to the business interests in PA that instigated the Baker Exploitation Company (see Wellmannn 2004 for more details).
The chain of connection between ciprés harvesters in the Tortel area, the Chilean Navy, and an intermediary in Punta Arenas has persisted until today. Ciprés has retained its importance as a livelihood resource, even though almost 70 years have passed since the initial settlers began harvesting the tree species. In part, this is due to the structural and chemical properties of the tree species, which make it unique for extracting and building given local environmental conditions. In addition, ciprés is still an important source of income for many households.

When I asked one interview participant, an elder who first visited Tortel in 1957 and had been harvesting ciprés since 1977, what importance ciprés still had for people’s lives, he responded,

*El ciprés... es muy valiosa tanto para edificar como para el sostén de uno... Para edificar, para todo, es lo mayor que hay!* (P01)

Indeed, most research participants told me that everything in Tortel is made from ciprés: the houses, the walkways, all kinds of boats. Also, ciprés wood serves as kindling for heating and cooking fires because it ignites readily, but burns very quickly and leaves a thick residue that clogs smoke shafts. The widespread use of ciprés wood is partly because the standing dead trunks are lightweight and thus can be carried manually through terrain that neither horses nor oxen can travel (an activity known as *hombreando* or ‘shouldering’). In addition, ciprés wood is extremely long-lasting, which is especially valuable in a wet climate. No other tree species in southern Chile compares to ciprés in this respect. One interview participant attributed this characteristic of ciprés wood to the economic demand for the species, even from non-local buyers:

*Porque la madera del ciprés no va a perder nunca la venta o el negocio, digamos, porque es una madera que en todas partes la peticion. Porque la tejuela de ciprés la mandan a hacer o la cortan una sola vez porque una casa de tejuela le debe durar eso como mínimo unos 70 años, 100 años, la tejuela de ciprés. O cualquier madera de ciprés.*
Porque aquí hay casa que tienen más de 50 años. La casa de la señora Chila que conoces, esa casa tiene más que 50 años, y esta así como la han hecho hace poquito tiempo, cierto? (P09)

Research participants cited ciprés as an important material resource relative to other tree species in ways besides its structural properties. I was told that ciprés was the most abundant type of wood available, the wood type of greatest value, and the only type of wood that was sold to Punta Arenas. I asked one interview participant when people started to use other tree species.

He replied,

No no, aquí más lo único exclusivamente es el ciprés porque ya lo otro no tenía tanto valor y por lo menos para Punta Arenas nunca se mandó coigue ni nada. Siempre se embarcó el ciprés. . .(P01)

Ciprés remains a crucial source of cash income generation today. When I asked an interview participant whether one used to be able to “get ahead” by harvesting or only subsist, he compared the historic and contemporary livelihood roles of ciprés as follows:

Antes se vendía igual la madera a plata y también se vendía por víveres. Pero igual la gente que ha surgido en madera, sé de hecho. Igual ahora se complementa con otra trabajo pero la principal fuente de surgimiento a alguna persona en el pueblo es el ciprés. Que a repente se complementa con otra tipo de trabajo pero en el fundo. . .que es el ciprés no más. (P03)

Generally, when interview participants were asked what they do (or to what they were “dedicated”), they answered, “ciprés”. Here are some specific responses:

Me dedico a hacer cipres. Cipres y carpintería, pero todo. . .el ciprés. (P03)  

I am dedicated to doing/ making ciprés. Ciprés and carpentry, but of everything, ciprés. (P03)

Bueno, yo he trabajado. . .más o menos de los 18 años en lo que es el ciprés. Básicamente eso ha sido mi trabajo desde siempre, sacando madera, por ejemplo de campo, yendo aquí para Tortel y sacando a Punta Arenas. Eso es un poco más o

I have worked, more or less over the last 18 years, in that which is ciprés. Basically, that has always been my work: harvesting wood, for example from the homestead site, bringing it here to Tortel and sending it out to Punta Arenas. That’s a little bit
In fact, when I asked what people in general do if they do not work in ciprés, my question was meant with incredulity and I was told, “well, everyone works in ciprés”:

La gente que no trabaja en madera de ciprés o no trabaja en madera, que hace? ¿Qué son los otros formos de trabajo? Aquí en Tortel? Casi toda la gente trabaja en ciprés. . .Igual trabajan en leña, de repente . . . el ciprés. Y hay otros que trabajan con ganado como yo pero con animales igual haciendo ciprés. (P07)

People that don’t work in ciprés wood or that don’t work in wood, what do they do? What are the other forms of work? Here in Tortel? Almost everybody works in ciprés. . . .They work in firewood, as well, once in a while. . . ciprés. And there are others that work with livestock like me, but with animals as well as doing ciprés. (P07)

Many Tortel community members are still involved in harvesting ciprés because they do not feel that they have viable or desirable alternate options. When I asked an interview participant whether he began again to work in wood when returned to Tortel after a sustained absence, he answered affirmatively for the following reason:

Es que acá no hay más trabajo porque aquí de no irse a meter en los trabajos que hay en la municipalidad, no hay más que hacer. (P08)

It’s that here there isn’t any other work because here, to avoid getting involved in the types of work [offered by] the Municipality, there isn’t anything else to do. (P08)

Though people still turn to ciprés for their livelihoods, ciprés is less and less available and is still, as ever, a marginal activity, though perhaps for different reasons today. This will be discussed below in the section entitled “Changing role of ciprés in lives/livelihoods”.

**Socio-cultural role of ciprés in lives/livelihoods**

While ciprés has primarily served as a livelihood resource for Tortel community members, it is also true that the practices of harvesting, elaborating and commercializing the species have generated specific forms of social engagement and other types of local customs that
have shaped people’s lives. In some cases, the socio-cultural relevance of ciprés emerged through research participants’ descriptions of the early days or reference to local legends, which hint at the meaning and source of pride that people derive from their shared and personal histories. Other times, research participants explicitly recognized the importance of these ciprés-related traditions.

As asserted earlier, the history of the Tortel area is very much the history of ciprés harvest and use. Research participants were vocal regarding this link between ciprés and their lives/livelihoods, and one interview participant specifically qualified Tortel’s history as an “historia maderera” or wood-working history (P05). However, most research participants framed this link between ciprés and the history of the Tortel area in terms of the material role of the tree species. When I specifically asked people about the importance or meaning of ciprés, they often expressed doubt regarding how to answer such a question. Ultimately, though, their replies suggest that ciprés is significant to lives/livelihoods in a deeper, more personal (rather than simply material) way. One interview participant said the following:

La importancia que tiene el ciprés en la comuna. Bueno porque el ciprés se fundó casi Tortel porque todo la gente que llegó empezó a trabajar el ciprés y construyeron sus viviendas con ciprés, construyeron las calles con ciprés. Y siguen susidiendo unas personas todavía con el ciprés. Es un fuente de trabajo que tienen el ciprés. Por eso es importante el ciprés en la comuna de Tortel (P07)

The importance that ciprés has in the comuna. Well, because ciprés just about founded Tortel because everyone that arrived began to work ciprés and constructed their houses with ciprés, constructed the streets with ciprés. And some people still continue to sustain themselves with ciprés. Ciprés is a source of work that they have. For these reasons, ciprés is important in the Tortel comuna. (P07)

That ciprés “founded Tortel” was reiterated by the following interview participant, who specifically expressed that he obtains personal meaning from this socio-cultural role of ciprés:

Así la gente entraron a poblar por el ciprés. Gracias al ciprés que pudimos estar, la gente aquí. Yo por lo menos soy un agradecido del ciprés porque gracias a eso se ha vivido y la gente se ha poblado los campo en Tortel, por Pascua y por todas partes porque la madera los llevaba a

So it was that people colonized due to ciprés. It’s thanks to ciprés that we the people could be here. I, for one, am grateful to ciprés because thanks to that one has lived and people have colonized Tortel, the Pascua and everywhere – because la madera led us to colonize. (P09)
Not everyone with whom I conversed spoke of ciprés as having such an active role in the
development of lives/livelihoods in the Tortel area. Some people mentioned the Chilean Navy,
the Municipality or even Pinochet (who is given credit for the construction of the Careterra
Austral). However, most research participants alluded indirectly to the significance of ciprés.
This was especially evident through the recounting of what I call one of Tortel’s “local legends”
– the tale of how the Navy began to regularly participate in la barcaza (the embarkation or
“launch” of ciprés postes destined for Punta Arenas). I was told this story or people referenced
its events on numerous occasions throughout my stay in Tortel, and it is included in Astorga and

In order to appreciate the legend, one should consider the following. The site where the
town of Tortel now sits was initially just another sector. However, the site offered a protected
harbor and was situated at a central geographic location where people traveling to and from the
other sectors and north through the Baker drainage on their way to get supplies from Argentina7
or, later, Cochrane, built camps and rested along the way. Most interview participants – pioneers
or their descendants, those with whom I conversed, or those interviewed by Astorga and Uribe
(2008) – referred to these arduous journeys when they were asked about the old days. Travel
during that period was described to me as follows:

Se demoraba 15, 20 días [entre Rio Bravo y Cochrane]. Porque en ese tiempo tenían que salir en bote del Bravo -- bote a remo -- subió por el Baker para arriba a remo hasta el Lago Vargas arriba para allí tomaban caballos... y eso era horroroso con el tiempo malo. Y las huellas también eran malas... El Rio Ñadis crecía y allí

It took 15, 20 days [to travel between the Bravo and Cochrane]. Because in that time they had to leave the Bravo in boat – row boat – ascend the Baker by rowing all the way up to Lago Vargas and there they took horses... and that was horrible in bad weather. And the trails were also bad... The Ñadis River would grow and they would have to

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7 Most research participants simply referenced “Argentina” without specifying a locale. One person told me he went to San Julian, which corresponds to Wellman’s (2004) account whereby the Baker Exploitation Company established a route of travel from the mouth of the Baker River to Argentina by way of Valle Chacabuco.
wait there for it to recede. There wasn’t a bridge, nothing to cross, only by horse when it receded. Now, not so, because everything is developed, it has a bridge. Then it was so difficult. The settlers from before were so, how should I say it, so. . .clearly they pushed on although they suffered, but finally they advanced no further. Now, of all those settlers from before, not one remains – only children. Their children remain. But they were very strong in face of those difficult courses. To live like that – they just tried to keep moving forward, that’s it. I don’t know why they went, it was so difficult. (P04).

A major turning part in people’s lives occurred when the barcaza was established – an event that is attributed to the feat of a few brave and determined pioneers. Weary of the month-long supply run to Argentina, and recognizing that ciprés was a valuable commodity, three men decided to journey to Punta Arenas to appeal to the Navy for regular support for their growing community. They spent about three months traveling through the fjords by row boat, stopping at Puerto Eden and one other remote village along the way. Meanwhile, another individual traveled throughout the zona collecting signatures in order to provide further evidence for the need for government assistance.

De eso me acuerdo yo, que de no haber sido por ellos no habría venido ningún buque. Ellos hicieron todo eso para que viniera el buque. Y ahí vino la compradora de madera y todo el resto, harta ayuda pa’ la gente, de eso me acuerdo yo. (Interview participant; Astorga and Uribe 2008, p. 57)

Of that I recall that had it not been for them, no ship would have come. They did it all so that a ship would come. And from there came the purchasing of [ciprés] wood and all the rest – plenty of help for the people. That’s what I remember. (Interview participant; Astorga and Uribe 2008, p. 57)

The barcaza is one example of the type of social engagement that formed around the practices of harvesting, working and commercializing ciprés. When the tradition first began, dispersed groups of colonists would bring their postes to various “ports” scattered throughout the zona – locations in the canals and inlets that were deep enough for the ship to anchor, usually close to river mouths or slopes where people had been harvesting (Astorga and Uribe 2008).
Given the presence of the Navy’s permanent post and other reasons mentioned previously, the principal port was always the site now occupied by the town of Tortel. The Navy ship would visit a port and everyone – men, women, children, neighbors, those with posts to embark and those without – would help each other offload supplies and load *postes*. When the ship moved on to another port, people traveled via their own boats to help out there as well. This process was known as *caleteando* (or “villaging”) (Astorga and Uribe 2008), whereby people who were generally geographically isolated, came together to work toward the goal of subsisting from ciprés.

The *barcaza* required Tortel community members to organize themselves in more direct ways, as well. Due to the limited space in the Navy ship’s hold, a process was needed so that everyone had an opportunity to send the quantity of posts to Punta Arenas that would yield enough supplies and food stuffs to last until the next *barcaza*. Thus, multiple families in distinct sectors formed committees that negotiated amongst themselves and with the Navy to schedule the embarkations, choose a committee member that would travel to Punta Arenas to complete the trade/sale, and decide how many *postes* each person could send (Astorga and Uribe 2008). One interview participant recounted,

\begin{quote}
*Unos embarcaban 500 palos, otros 1000, otros 700 y así, pero había una organización porque si usted no pertenecía a la organización, no cargaba palo. . . Tenía que ser socio porque casi todas las personas que estaban acá eran socios porque se vivía de pura madera. No había otro sostén. Así que estaba obligado a asociarse al comité.* (P01)
\end{quote}

Some people embarked 500 trunks, others 1000, others 700 and so on, but there was an organization because if you didn’t belong to the organization, you didn’t get to load even a trunk. . . .You had to be a member because almost everybody that was here was a member because one lived solely from [ciprés] wood. There wasn’t another form of sustenance. So one was obligated to associate oneself with the committee. (P01)

The initial ships that came to pick up ciprés posts were capable of storing 17 thousand individual *postes* (each of about 12cm in diameter and 2.20m long) (Astorga and Uribe 2008). According to a Tortel community member interviewed by Astorga and Uribe (2008), the amount of *postes*
generated by a single sector, in the early days, was often so great that not all the posts available could be sent to Punta Arenas.

Besides the social patterns inspired by the *barcaza*, other traditions were formed. For example, it became customary for people to stack ciprés posts in carefully-arranged *castillos* (castles) at the various ports of embarkation. These have become emblematic of Tortel’s history and culture. Today, people sell model *castillos* to tourists. Other customs formed around the need to transport *postes* from one’s remote homestead to sites of embarkation. Before there were motors, people used *chalupas* to navigate the rivers and fjords. These were wooden boats of Mapuche influence, a style passed on to Tortel community members via their direct or ancestral connections to Chiloé. In addition, people constructed rafts or *balsas* of ciprés trunks that they floated down rivers and pulled through canals. Research participants often asked me if I had seen or was told about ciprés *balsas*: they are proud of the feat of navigating these 1000- to 1500-log rafts down the powerful Baker and Pascua rivers, often equipping them with fire pits for cooking and heating during the journey. Balsas of ciprés *postes* still arrive in Tortel for the regular *barcaza* today, though these are usually pulled by motorboat.

The harvest of ciprés was also a social, and in some senses, communal activity. People were more-or-less isolated on their homestead sites, and for a long time the closest school was in Cochrane. Thus, children started participating in the harvest of ciprés at an early age. One interview participant described how she helped harvest ciprés with her family:

*Trabajaban ellos los...o se puede decir todos. Toda la familia hasta yo que era niña ayudaba un poquito igual. Iguál a sacar rollizos así a pulso. Le ponían una cuerda así, tira a dos más adelante dos mas acá y dos mas allá y a mí me ponían adelante para tire con una sola cuerdita yo era adelante. Iguál le ayudaba un poquito. Todos salían, mujer aprendió. . . .(P04)*

Everybody worked. The whole family, even I who was a little girl, I helped a little bit as well - even to [harvest] rollizos by hand. They put a rope like so, pulled at two more in back, two more here, and two more there, and they put me in back to pull with a little rope. I was the person in back. I was able to help them a little. Everyone went out [to harvest], even women learned. . . .(P04)
Not only family members, but neighbors would work together to cut, trim and haul postes from bogs and upland sites. In the early days, when standing dead ciprés was relatively plentiful, those that had ciprés on their campo would often let those without simply harvest wood that they needed to build homes, corrals, etc. Alternately, and specifically in preparation for the barcaza, people would work a medias or “go halves” with the land owner: perhaps 500 posts would be cut for oneself and 500 for the proprietor.

The system of “going halves” meant that people might have their own campo in one sector, but spend weeks at a time working ciprés in a different sector. I often heard about individuals who lived in the lower Baker, but who traveled three days upriver by row boat in order to harvest ciprés near Vargas Lake. As more people were drawn to the Tortel area following the establishment of the barcaza and the arrival of amenities such as the Empresa de Comercio Agrícola ⁸ and health clinic, the amount of available land containing ciprés diminished. Thus, working a medias was the only option for new people to get involved in ciprés harvest. Consequently, people began congregating around sectors that contained abundant, readily-accessible ciprés (e.g., Vargas Lake, Lower Baker, Steffens, Montt, and Pascua). People either started making homesteads on pieces of land that did not contain ciprés, but were in the vicinity of such sites, or they began building homes in the village of Tortel and “commuting” to work ciprés ⁹.

People in the Tortel area recognize their history and lifestyle as unique. They feel that they and their ancestors have sacrificed in order to build lives in a part of Chile that is remote.

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⁸ This was a government-sponsored supply outpost until the 90s when it became private.
⁹ Today the Vargas Lake sector is all-but-abandoned, and the nearest school-children are about 50 kms away, but the presence of the one-room schoolhouse speaks to a time when this area was a center for social gathering.
and harsh, and they expressed pride in their origins. When asked about why being a member of Tortel was important, one interview participant responded:

"Ahora ya un pueblito porque cuando yo llegué era todo así natural no más. No habían ni una cosa y ahora ya así. Entonces para mi importante Tortel." (P04)

"Now it’s a little town. When I arrived, everything was just “natural”. There wasn’t anything and now there is. Thus, for me, Tortel is important." (P04)

In recognizing and asserting their connections to the creation of Tortel and role of ciprés in that process, people identify themselves or fellow community members as *pioneros* (pioneers) and/or *madereros* (wood workers/harvesters). People often referenced their relatives who first arrived in the *zona* or described their own arrival as they told me about their lives. Generally, one is considered a *pionero* if he/she was one of the founding settlers:

"Por lo menos me considero [un pionero] porque nosotros vinimos a sembrar casi el espíritu de la población acá. Porque si no habríamos tenido constancia pues no habría nada acá pues. O sea no solamente yo porque había otros pioneros que son más antiguos claro, pero yo por lo menos me cuento desde el año 57 que yo ya venía a conocer acá, venía seguidamente venía vuelta vuelta. . . . Tengo un reconocimiento como pionero antiguo. . . ." (P01)

"I consider myself a pioneer because we practically sowed the spirit of the population here. Because if we hadn’t been steadfast, well, there wouldn’t have been anything here. Not only me, because there were other pioneers that were older than me, certainly, but I for one count myself as having been here since the year ’57; I came repeatedly time and time again. . . . I’m recognized [by others] as one of the old settlers. . . ." (P01)

However, a second generation Tortel community member told me that he considers himself a *pionero* because he was born and raised in the *campo* and has spent his entire life living and working in the Tortel area. In addition, many people told me that it is important for them to be self-sufficient, implying that they possess some classic “pioneer” traits, even if they do not think of themselves in that way. For example, I was told the following about an interview participant’s experiences working in Punta Arenas:

"No me gustó. Es que a mí nunca me ha gustado el ritmo de la ciudad. Como soy, pa’ vivir en ciudad! Es que a mí siempre me ha gustado ser independiente entonces, no. Ya tener que andar trabajando y y que te digan “tienes que hacer esto y tienes que hacerlo así” para mi, no. Lo que hago, . . ." (P01)

"I didn’t like it. It’s that I’ve never liked the rhythm of the city. How am I one to live in the city?! It’s that I’ve always liked to be independent, in which case, no. To have to run around working and they tell you, “you have to do this and you have to do it this way”, for me, no. What I do, I do my way."
lo hago a mi manera. El día que quiero trabajo y el día que no, no trabajo. (P08)
The day that I want to work, I work and the day that I don’t, I don’t work. (P08)

Other individuals mentioned that they like living in the campo because they can be self-sufficient: they have everything that they need right there (e.g., firewood and water).

The identities of pionero and maderero are very much linked by ciprés:

Hay muchas personas aquí de los pobladores antiguos, los viejos, de los que tienen 40, 50 años, que se han criado por el ciprés. Han vivido del puro ciprés. (P01)

There are many people here who are descended from the original settlers, the elders, those that are 40, 50 years old, who have been brought up on ciprés. Who have lived purely of ciprés. (P01)

Indeed, many individuals told me that they began harvesting ciprés with their fathers10 as soon as they were able to carry a palo (ciprés trunk), perhaps between the ages of 8 and 12. Commonly, one would start harvesting for one’s self – sending one’s own allotment of wood to Punta Arenas – at the age of 18. Research participants told me that they had been “working in wood” for 14 years, 25 years, or even 47 years. When I asked whether and why research participants considered themselves madereros, a few people told me simply that it is “what they do”. In some cases, this was framed as a necessity. In others, harvesting or otherwise working with ciprés was perceived as an activity that granted one some measure of independence. The following are some of the responses I was given when I asked interview participants what it meant to be a maderero and if that were significant to them:

Uno a veces sustenta del casi la mayoría del año del ciprés. Se hace diferente tipo de madera – de postes, madera aserrada, palos más como rollizos, en bruto. Uno siempre va a cortar madera y venderla y sí. Aquí siempre vive el ciprés. (P03)

Sometimes one sustains oneself almost the majority of the year on ciprés. One makes different types of wood – postes, sawn wood, trunks more like rollizos, uncut. One always goes to cut wood and sell it and so on. Here, one always lives ciprés. (P03)

Si. Porque trabajo en eso – madera. . . Si,[es importante] porque eso para vivir. (P07)

Yes. Because I work in that – la madera. . . Yes, [it’s important] because it’s to live. (P07)

10 The majority of my research participants were men. While I was told numerous times of how women helped extract ciprés, only one woman was described to me (and referred to herself) as a maderero. In general, women of the Tortel community routinely participate in gathering/hauling wood and are well-versed in the use of axes and chainsaws.
No sé si sea importante pero es que uno ha vivido su vida en eso. Es el sustento de la vida de uno. Si uno no está trabajando en la madera... tendría que estar trabajando en la municipalidad, mensual, andar recogiendo basura. Uno no está pa’ eso! (P08)

I don’t know if it’s important, but it’s that one has lived one’s life in that [activity]. It’s one’s life sustenance. If one isn’t working in wood, one would have to be working in the Municipality, monthly, running around picking up garbage. One isn’t meant for that! (P08)

Other research participants elaborated upon the significance of their work with ciprés, acknowledging that it has implicated them in the process of forming what is today Tortel, and noting that it has granted them a unique lifestyle that has conferred autonomy (if not wealth) and that is shared with fellow community members:

Para mi es importante porque creo que el ser maderero es como... algo que tiene que ver con nuestra caleta. Porque la caleta empezó por los madereros y hasta ahora todavía se está trabajando la gente como maderero. Es como el trabajo más importante que hay acá en la caleta. (P06)

For me, it’s important because I believe that being a maderero is like... something that has to do with our village. Because our village began on account of the madereros and up until now people are still working as madereros. It’s like the most important work that there is here in the village. (P06)

Bueno, yo creo que la madera me ha servido de todo porque mi casita, mi lancha la he hecho yo con madera de ciprés más que nada, y después que también he vivido del ciprés, como le digo hasta la fecha, porque yo no soy un hacendado. No digo que uno no tiene su campo, ni que no tiene un par de animales; todos los tenemos, todos los pobladores acá pero no como hacendados, digamos. Que vamos a vivir del capital como el sustento del año? No. . . . Entonces yo me siento contento que he sido un maderero como tantos otros, y he vivido de la madera y hasta aquí no me ha faltado por el poder de dios. (P09)

Well, I believe that la madera has served me in all things because I have made my little house and my boat from ciprés wood more than anything else, and I have also lived off of ciprés until today, as I told you, because I am not a large landowner. I’m not saying that one doesn’t have his land or a pair of animals; everyone has them, all of the settlers here, but not like large landowners, let’s say. That we’re going to live off of capital throughout the year? No. . . . So I feel content that I have been a maderero like so many others, and I have lived from la madera and so far I have not wanted for anything by the power of God. (P09)

In addition to linking one to the creation of Tortel, being a maderero is important because it implies that one possesses certain skills and knowledge. Knowing, for example, how to tell whether a ciprés snag is rotten without cutting it down, judging the value of a trunk by sight, or
being able to use a chainsaw or axe to shape wood, are some of the skills of a _maderero_. The following quote illustrates some of the other practices performed by a wood worker/harvester:

_Maderero_ significa uno que sabe todo lo que es parte. El grosor de la madera, el largo de la madera, labrar madera y herrrar madera. Es en sí el maderero: El trabajo se dedica a trabajar en la madera. Maderero, trabaja que parte de la madera? Madera bruta, madera muerta. Eso es maderero: que trabaja en la pura madera. (P02)

_Maderero_ means that one knows all that is a part [of working with wood]. The width of the wood, the length of the wood, to carve wood and trim wood. It’s in this, the _maderero_: his job is dedicated to working with wood. Uncut _madera_, _dead madera_. That is a _maderero_: that he works purely in _madera_. (P02)

Being a _maderero_ links one to the practices of extraction and practices of carpentry: from finding, felling and transporting raw material to shaping it into a final product that is eventually sold. One interview participant seemed to summarize all of the above ideas about the importance, practices and knowledge of a _maderero_:

_Claro, maderero... una se forma en maderero porque en este caso, como te conversaba en adelante, que hay que hacerlo. Muchas veces el mercado de madera es muy bueno. Entonces si yo tengo esta visión de ser maderero, tendría que empezar a controlar mi bosque para que no queda tanto de lado. Se siente orgulloso ser maderero. Porque realmente el maderero con su producto, hace poblaciones. En el caso de Tortel, labrado las casas, y así... . . . (P10)

One becomes a _maderero_ because in this case, as I have conversed with you before, one has to do so. Many times the market for wood is very good. Therefore, if I have this vision of being a _maderero_, I will have to start to control my forest so that it’s not wasted. One feels proud to be a _maderero_. Because, really, a _maderero_ with his product makes populations. In the case of Tortel, carving houses and so on. . . .(P10).

Through a _maderero_’s dependence on ciprés, he/she is a reflection of Tortel’s past. Yet by utilizing his/her wood-working skills and taking responsibility for the stewardship of his/her resources, such a person also helps to shape Tortel’s future. Ultimately, it seems that the term _maderero_ is distinct from and perhaps more appropriate to apply to Tortel community members than _ciprés harvester_ because it is all-encompassing: it captures engagement in the natural environment as well as social and economic arenas, and it links people’s identities to the past, present and future.
Changing role of ciprés in lives/livelihoods

According to research participants, ciprés remains an important part of people’s lives and livelihoods today. Indeed, many of the same practices and traditions have continued steadily for the past 60 to 70 years. Tortel is still very much the domain of the maderero: piers throughout town are littered with ciprés rollizos, la barcaza still arrives every three to four months, the sound of chainsaws is almost constant, and one leaves town smelling of ciprés wood smoke (Figure 7). However, fewer people turn to ciprés to meet their daily needs. Participant observation and semi-structured interviews reveal that this is due to the changing availability of the resource, as well as the changing needs and desires of Tortel community members and the new opportunities available to them. In this section, I will explore the above drivers of change and their effects on the material and socio-cultural roles of ciprés in Tortel community members’ lives/livelihoods.

Figure 7. Scenes representative of the link between Tortel and the harvest, use and sale of ciprés: a) portable mill; b) stack postes along the Southern Highway; c) the barcaza; d) pier laden with rollizos; e) creating ciprés shingles via axe; f) tracks through a ciprés bog.
Changing Availability

The role of ciprés has primarily changed because ciprés wood has become less available as a livelihood resource. This is meant in two ways: 1) the quantity of usable and accessible ciprés trunks has diminished; 2) people’s capacity to commercialize their raw or value-added products continues to be limited. Both of the above factors are influenced by that fact that ciprés harvest/sale has become increasingly regulated by CONAF.

There seems to be universal agreement within the Tortel community that ciprés, as a resource, is now “scarce”. People initially became dependent on the harvest of the tree species because it was the only resource they could tap into, and the community subsequently developed because viable ciprés was plentiful relative to the numbers of people and specific practices engaged in order to extract the tree. As discussed in the Biophysical Context section above, the quantity of ‘viable’ ciprés trunks depends on the following: the abundance of ciprés trunks that possess characteristics that make them desirable for use, and the accessibility of those trunks. Both factors have shifted over time.

The decreasing quantity of viable ciprés seems to be the result of a number of influencing factors: steady harvest since the 1940s, including an increase in the number of harvesters in the 1960s following the establishment of the Navy post, but also the arrival of the chainsaw in the 1990s. The following are a couple of interview participants’ accounts of how ciprés harvest has changed:

Aquí, como le contaba, toda la gente que conozco, nosotros poblamos en ’59 y ya vendían ciprés. Se vendía para Punta Arenas. Ya la gente, como decían, se mareaba de ciprés. Y así seguimos juntando, todos los que éramos joven. Ahora yo, claro, trabajo del ciprés pero ya no en una forma de cantidades grandes sino que a veces uno vende

Here, as I was telling you, all of the people that I know – we settled in ’59 and they were already selling ciprés. It was sold through Punta Arenas. Already, people were swimming in ciprés, as they say. And we continued together like that, all of us young folks. Now I work in ciprés, but not in terms of great quantities, but rather sometimes one
The above testimony plus other information shared by research participants suggests that there have been three main periods of ciprés exploitation. At first, standing dead ciprés was readily accessible because it was closer to ports of embarkation, homestead sites and/or waterways that could be used for transportation. During this period, people only had axes and row boats at their disposal; however, they were generally harvesting smaller-diameter trees and spending less time searching for viable trees. By the mid-80s, chainsaws and boat motors were available, thus increasing people’s access to ciprés stands located farther away as well as their capacity to harvest the trees. In addition, people were more easily able to haul wood to the barcaza given that they no longer had to spend days rowing to/from their harvest sites. According to research participants, these factors made for a relatively prosperous period in the live/livelihoods of Tortel community members. It was probably during the early stages of this period that people were harvesting over 100 postes per day, amassing up to 1500 postes per raft over the course of three
months, and then sending 500-800 to Punta Arenas. By the early 90s, however, the closest ciprés stands had been harvested, and increasing quantities of fuel were needed to travel to sites containing viable ciprés. These conditions have persisted until today. During the barcaza of April 2010, only 7500 postes were sent to Punta Arenas compared to the 13,000 to 17,000 that were shipped in the past.

Today, access to the remaining ciprés resource is also affected by social and political factors. For example, land owners who still have ciprés are not as likely to let people outside the family harvest ciprés, even a media. Given that very little ciprés exists on public lands, this means that the majority of the remaining ciprés resource rests in the hands of a small number of proprietors. There are about 8 different properties on which there is still substantial ciprés. The implications of this finding will be discussed in more detail later in this section.

Compounding access issues is CONAF’s increasing enforcement of forest management regulations. Management plans are a legal precursor to harvesting forest products (including dead trees) (Decree Law 701), however, CONAF was not mandated to enforce management regulations until 1998 (Law 19.561). In fact, CONAF did not have a consistent presence in the Tortel area until about the year 2000. At that time, Tortel community members became required to develop management plans for resource use on their properties and to maintain records of the number of wood products extracted and details regarding their sale. By law, small land owners are given access to forest engineers who can help them develop management plans. However, regular fees are involved in the process and management plans have to be renewed every two years.

In general, research participants did not share many details with me about regulations pertaining to the harvest of ciprés or other land use activities. This may reflect my treatment of
this subject during casual conversations and semi-structured interviews; alternately, Tortel community members may not be well-versed in the management process. The one theme mentioned by many individuals was the illegality of harvesting live ciprés and the assertion that this had never been common practice since live trees are heavier, more prone to being rotten and more difficult to work into a final product than dead trees. Several told me that it was easy to get a management plan and that they had positive experiences working with CONAF employees. One person commented on the cursory nature of the reconnaissance of his property that precluded the creation of the plan guiding his ciprés extraction. A number of individuals expressed frustration at not being able to use fire to renew pasture lands or to harvest regenerating stands of ciprés. Multiple people expressed either an inability or unwillingness to pay fees or bother with the renewal process. The possibility that people are actively resisting management of their lands could be another reason why people did not appear to have much to say about the issue.

Access to ciprés as a livelihood resource is also limited in terms of market connections. The barcaza is the only venue for selling postes that is accessible to anyone (who has access to the material resource). Besides this, the Municipality is the largest purchaser of ciprés wood and carpentry/construction contracts. However, one has to compete for contracts with the Municipality and some research participants felt that they did not have the capacity to do so. People also expressed the opinion that the same individuals are regularly awarded contracts, perhaps given filial connections within the local government. While some people are taking advantage of the Southern Highway to sell ciprés, not everyone has made connections to markets in Coyhaique or is able to pay transportation fees. Finally, some people have acquired enough capital to purchase personal sawmills and thus tap into a relatively new economic niche.
However, there may not be enough demand for these services to allow more than a few individuals to make a living in this way.

*Changing needs, desires and opportunities*

Besides the diminished availability of ciprés, the role of the tree species has also changed because people are not content to live off of ciprés harvest anymore. For one, they are physically and mentally worn out from years of monotonous, brute work. Individuals described themselves as having been beaten by (*uno aporreaba*) or gotten angry or fed up with (*uno cabrearse*) ciprés harvest. When I asked one interview participant what was most difficult about his work, he replied,

*Bueno, es todo difícil po! En el momento que tú te metes al bosque, de repente igual andáis peligrando que te pase un accidente. De repente tú no te das cuenta, te caes, te cortas con la moto sierra, y en el momento estás totalmente peligrando que te pase cualquier accidente. Difícil, no, no lo encuentro difícil pero sacrificado, sí. No me he encontrado algo, pero puede ser en el bosque.*  
*(P10)*

Research participants also expressed that they want to spend more time at home with their families, rather than weeks at a time harvesting ciprés in the campo. In addition, it is not good enough to simply survive anymore. People want to surger or get ahead: they want to make a living and offer long-lasting support to their families. These sentiments are reflected in the following interview participant’s assertions regarding what he wants for his children:

*... Uno has to continue to save money over time so that tomorrow one’s children will have and will go to school with a little bit of money and so one looks for [a way other than harvesting ciprés] to earn more money. ...the only thing that one wants is that what happens to one’s kids isn’t what happened to oneself because I didn’t go to school and I worked my butt off. If I had gone to school I could have worked elsewhere, at something easier.*
Tortel community members are indeed taking advantage of new opportunities, such as jobs through the Municipality. In fact, some people perceive the local government as the sole progenitor of new opportunities:

Acá es bien importante la Municipalidad. . .porque hasta el momento es la única...es como la empresa que daba trabajo. (P03)

Here the Municipality is plenty important. . .because up until now it’s the only. . .it’s like a company that offers work. (P03)

These positions offer individuals the chance to participate in something wholly different than ciprés harvesting. About 30 people work for the Municipality in professional positions.

However, many of these individuals are not originally from the Tortel area. For skilled and unskilled laborers, the following options exist: grounds maintenance, custodial work, radio communication, boat service to remote sectors, or the construction of public works. There are also opportunities and career development programs specifically for women. As noted earlier, however, many Tortel community members – those self-identified sons-of-pioneers and/or madereros – are resistant to this kind of work and associated lifestyle.

[Soy] muy independiente, un pionero, soy orgulloso con mis cosas porque al final uno va a la Municipalidad a hablar con el alcalde y chuta! Hay que pasar 4 o 5 horas y quién le hace a uno el resto de las cosas? Uno hace las cosas. Entonces para estar esperando no, no soy de esperar. (P02)

I’m very independent – a pioneer – I’m proud of my things because eventually one goes to the Municipality to speak with the governor and, shoot! One has to spend 4 or 5 hours and who’s going to take care of the rest of one’s things? One takes care of oneself. So, to have be there waiting, no, no I am not one to wait. (P02)

It seems that people with the above sentiments are still partially-dependent on ciprés, supplementing the sale of postes to PA and/or rollizos to the Municipality with the haphazard
sale of firewood, meat, or the odd carpentry job. Some enterprising individuals are interested in options for commercializing other resources on their lands. For example, a study was conducted on the potential for peat harvest/sale; and one research participant expressed interest in creating a eucalyptus plantation.

CONAF has generated new opportunities for some land proprietors via a program labeled “Tortel III”, which is in about the 2nd year of operation. The goal of this program is to encourage Tortel community members to start harvesting tree species other than ciprés. To do so, CONAF has established one-hectare pilot projects within forests on private lands. Forest engineers have worked with land owners to mark coigue and mañío trees, and have provided each proprietor in turn with instruction and use of a large mobile saw that is capable of milling large-diameter logs. I did not have the opportunity to talk to program participants in depth about their experiences. However, I did join a CONAF employee on his rounds to check in with land owners as to their progress felling and/or milling trees. One person expressed frustration at what he perceived as an intrusion by the government and an infringement on his independence and capacity to use his forests as he saw fit. Another, who had not taken any steps towards engaging in the pilot project even after four months, seemed distrustful of CONAF and wary of participating in Tortel III. Finally, a true market for wood or wood products for species other than ciprés has not yet been established. When asked whether it is possible to sell mañío or coigue, one interview participant responded:

Mañío podría ser pero este es el tema -- como hay que tener plan de manejo, falta mejor aserradero. Gente que tenga más aserraderos para poder instalarlo en una parte y trabajar. Eso falta. (P06)

Mañío is possible, but this is the problem: that one has to have a management plan, and one lacks a better saw mill. People need to have more mills so that they are able to install them in an area [of their campo] and work. That’s what’s missing. (P06)

Basically, even if land owners with siempreverde species wish to continue accessing this resource following the pilot projects, they may be hindered by 1) a lack of capital (i.e., only one
participant actually owned his own saw mill); 2) the perceived hurdle of acquiring a management plan; and 3) inability to actually sell their products.

Finally, almost all community members with whom I spoke alluded to an interest in tourism. People are constructing artesanía (wood crafts), storage lockers, cabañas (cabins, or small apartments), hostels, cafes and boats with the goal of participating in what everyone hopes is a blossoming industry (see Becerra 2008 for an investigation of the role of tourism in Tortel today). When I asked whether everyone was concerned about the scarcity of ciprés, one interview participant mentioned tourism as a solution:

*Sí po, porque como yo decía, es el mejor fuente de ingreso y ya no queda. Entonces después hay que inventar otras cosas como la pesca, el turismo. Pero el turismo es por temporada y es difícil porque hay que tener recursos para trabajar.* (P06)

Yes, because as I was saying, it’s the best source of income and it’s already gone. Thus, afterwards, one has to invent other things like fishing, tourism. But tourism is seasonal and it’s difficult because one has to have resources in order to work. (P06)

The primary resource needed is money in order to construct amenities for tourists. It seems that government-sponsored small business funds are available if one is able to successfully apply for them:

*Bueno, con la tecnología uno puede postular solo, por Internet, pero uno tiene que saber hacer un proyecto. Si no, no salen tampoco. Y antes cuando la muni tenía gente, por ejemplo que se llama Servicio País, ellos ayudaban a hacer los proyectos. Hoy día es más difícil porque no están, entonces tiene que pedirle a una persona por ahí, que te ayude. Y de repente la persona no tiene mucho tiempo, no le sale bien el proyecto, entonces no sale.* (P06)

With technology – the internet – one can apply on his/her own [as opposed to through the Municipality], but one has to know how to create a project. If not, it won’t be funded. And before, when the Muni had people, for example from Servicio País [Chile’s AmeriCorps equivalent], they helped to create projects. Today it’s more difficult because they aren’t here, and thus one has to ask someone at the Muni to help you. If that person suddenly doesn’t have much time, then the project won’t be funded. (P06)

Many people spoke to me of the seasonal nature of tourism (which, in some cases, keeps them involved in ciprés harvest). As a result, some individuals tout an industry such as salmon farming as the next major source of employment for local people. Along similar lines, one
research participant asserted that what Tortel needs is a wealthy sponsor or company; and another suggested payments for conservation.

The scarcity of viable ciprés trees and options for commercializing ciprés wood products, coupled with the above needs, desires and opportunities have affected the role of the tree species in people’s lives/livelihoods. While ciprés harvest and use had once been a lifestyle shared by most Tortel community members, today new lifestyles have emerged and as a result patterns of social engagement and even shared and personal identities are shifting, as will be discussed below.

**Changing Lifestyles and Social Engagements**

Given the diminished quantity of viable ciprés and the presence of other livelihood opportunities, fewer Tortel community members engage in the same routine practices. For example, there are no longer many individuals who are solely dedicated to ciprés harvest, as supported by the following testimony:

> No maderean ya, no. Trabajan en otro trabajo ya que puedan trabajar en otro trabajo. Ya quedan poco que maderear. (P04)

> Hay personas que se dedican a solo madera. Por eso es que levantan tanto. Uno no, pues uno no está trabajando solo en la madera. Uno está un tiempo en la leña, otro tiempo en la madera, otro tiempo en la cocina. Va y hace distintas actividades. (P02)

They don’t harvest ciprés anymore, no. They work at other jobs now that they can. There are few people that still harvest ciprés. (P04)

There are people that are dedicated solely to ciprés harvest. That’s why they run around so much. Another person, no, since he isn’t working only in ciprés harvest. He’s working for a time in firewood, another time in *la madera*, another time in the kitchen. He goes and does different activities. (P02)

Likewise, daily life is no longer oriented around preparing for the *barcaza*:

> Que era como vivíamos haciendo madera. Que . . . venido la barcaza, cargar las cosas, vendían y se va la barcaza y seguimos hacer madera por la otra barcaza. . . .y ahora hacemos madera pero no tan recorrido porque hay otras cosas que hacer acá y de repente otro trabajo, pero igual la madera. . . . en agosto unos 10 días 15 días antes

It used to be that we lived working *madera*. The *barcaza* arrived, things were loaded, they were sold and the *barcaza* left and we continued to harvest ciprés for the following *barcaza*. . . and now we make *madera* but not as earnestly because there are other things to do here [in Tortel] and suddenly other work, but ciprés harvest as well. . . .
August, 10 or 15 days before [the barcaza], I’m going to harvest ciprés. (P03)

In general, it seems that people calculate the exact number of postes needed in exchange for whatever supplies are desired (e.g., food staples, computers, metal roofing, etc.), and they dedicate just that amount of time to harvesting ciprés.

The nature of the barcaza as a social gathering has also changed; it no longer appears to be a process of caleteando. In part, this is due to the fact that since 2000 the Navy ship began only to dock in Tortel proper, rather than visiting the other sectors (Astorga and Uribe 2008). I was in town when the barcaza arrived in April 2010, and I was surprised by what I perceived to be a small number of event participants as well as a lack of extended family. When I asked a research participant whether the barcaza used to be more of a social occasion, he said yes, it used to be a unique opportunity for people to spend time with others that they had not seen for a while. He also told me that there was a time when Tortel community members were generally better-off and the loading/off-loading would be followed by a barbeque and dance that both locals and mariners would attend.

The barcaza has also changed in terms of social organization. Whereas people used to be organized by sector, today there are two organized worker collectives or ‘associations’. There are tensions between the two groups due to issues of exclusivity and competition, both for a limited resource and limited market. People told me that the newest association is composed mainly of members of just a few families. One individual told me that when he tried to join the group, he was rejected without explanation. Another exclaimed in frustration that there are only a few true madereros in the association and that the rest are aficionados (amateurs) or oportunistas (opportunists).
This sense of competition and exclusivity is also reflected in how land owners now restrict their remaining stock of ciprés for family use:

Dead ciprés, no, no... you don’t have it – there isn’t anymore! It’s finished! It doesn’t grow or anything because it’s dead... a person has changed his/her way of thinking. Now they control it heavily. That is, of almost all of the land proprietors, they don’t give permission to hardly anyone to cut ciprés. They have formed a “family business”. Only for the immediate family, children, and invited individuals, but very few. Before it was different because as there was so much ciprés then nobody thought that one day it was going to finish. Then people always gave away postes, whoever could cut, but later when the ciprés began to end, the proprietor saw that it was the source of income – the principal source of income that the family had – there one realized and took note. (P03)

This is another way in which the practice of ciprés harvest has shifted away from the “communal” activity that it seems once to have been. Today, land owners, members of their families, close friends or community members held in especially high esteem in general are those that have access to particular sites that contain ciprés.

Because people are no longer sharing the resource of ciprés, they are also no longer sharing time together in the campo. The decreasing time people expend toward ciprés harvest (particularly in terms of amassing postes) is also interrelated with people’s changing relationships with the campo. For some people, it seems that the campo is no longer “home”. It is no longer the center of family life, nor a place where one chooses to spend extended amounts of time. It is simply a source of resources, such as ciprés wood when one needs extra cash or material for construction projects in town. Research participants often told me that they spend only 10 to 15 days at a time on their ancestral homesteads. This is quite a contrast to the early days when people spent months or even years (in the case of women and children) without
venturing far from the family’s land. In many instances today, only one or two individuals – usually a family elder and/or an eldest son – remain as residents at a homestead site. However, even these individuals seem to split their time between the campo and Tortel (or Cochrane, in the case of those individuals who live further north in the Baker drainage). They come to town bringing ciprés, firewood and/or meat, and they purchase cigarettes, fresh vegetables and other supplies, meanwhile living with family members or perhaps in their own second homes.

Not only are people choosing to spend less time in the campo, but they are less able to make ends meet through a lifestyle based in the countryside. I was told by research participants that people are moving away from the campo as the amount of viable ciprés diminishes and people search for opportunities elsewhere. The Navy ship stopped venturing to the Pascua sector, for example, because not enough postes were emerging from that sector to make travel there worthwhile. In turn, people started leaving the sector because they could not afford to transport ciprés wood all the way to Tortel for the barcaza. Whereas there were once 10 to 14 different family groups in the Pascua, less than a handful remain. Thus, settlement patterns are shifting again on account of the presence/absence of ciprés. However, there seems to be some tension regarding these moves today: people do not necessarily want to leave their homesteads, but they do not feel that they have an alternative. An interview participant told me,

...es cierto hay gente que está en los campos... algunas tienen la suerte que hay terreno donde puedan tener su vaquita y ahí están felices. Pero hay otras personas que tienen campo pero por tenerlo no. Ya se terminó el ciprés algunos, o no puedes tener una vaca, no puedes tener nada, muy malo. Te vas p’allá y volví más pobre que cuando fuiste porque no es para... se terminó. Por ahí hay mucho campo abandonado porque se acabó el ciprés y te viste obligado a abandonarlo. (P05)

certainly there are people on homestead sites... some have the luck of having terrain where they can have their little cow and there they are, happy. But there are other individuals that have campo but to keep it, no. In some, the ciprés is already gone, or you can’t have a cow, you can’t have anything, it’s very bad. You go there and you return poorer than when you left because the campo isn’t... it’s finished. Many homestead sites are abandoned because ciprés is finished and you see yourself as obligated to abandon it. (P05)
Changing Identity

Not surprisingly, the above changes are associated with shifting identities, particularly that of *maderero*. During the course of our conversation, one interview participant extolled the skills of his trade, but also repeatedly asserted that ciprés harvesting is difficult work and that he hopes his son will not follow in his footsteps:

*I told him not to get involved in work in ciprés because it’s very exhausting, it’s very *forzado*, one suffers a lot. Thus, I don’t want that to happen to my child. I hope that he has another activity because it’s very damaging to one’s lower back, one’s spine suffers a lot, one gets very cold, muddy. Thus, I don’t want that to happen to my son. I hope that he secures work other than what happened to me.* (P02)

Other individuals make a point of no longer identifying themselves or others as ciprés harvesters, and associate this change with the decline in available ciprés and the resulting shift in lifestyle:

*I was a *maderero*. Everybody that you see here in Tortel was a *maderero*. There are those of us who, for one reason or another, have already left it behind, but yes, we were all raised on that and the elders died and we continued. Since ciprés has been ending, people are abandoning homesteads, selling homesteads and there is no opportunity to continue either way. Some people would like to continue harvesting ciprés but they don’t have anywhere to harvest. But, yes, I see that while there is still ciprés, they’re not going to stop selling it. And from there, when there is no more ciprés, I don’t know what will become of Tortel.* (P05)

Individuals who persist in dedicating themselves to ciprés harvest are regarded with an interesting mix of respect, awe, disdain and disbelief. This is the perspective of one of the most practiced *madereros* in Tortel, who was the subject of a number of commentaries by research participants. One person pointed out that he looks older than his years and asked, incredulously, “He works all the time, but for what?”
The changing lifestyle in the Tortel area has also been accompanied by changing relationships between people and changing conceptions of the Tortel community in general. For example, one interview participant pointed out that because not everyone is dedicated to ciprés harvest anymore, not everyone is concerned about the scarcity of ciprés. This lack of universal concern appears connected to a palpable change in how people interact with one another. Multiple research participants told me that Tortel is unique because one knows everybody and people are friendly and open; people are always greeting each other on the street and inviting one in for mate. However, many of these same individuals also claimed that this practice is changing. Some research participants suggested that the pace of life has changed with the arrival of the road, bus schedules, and the nine-to-five work day associated with Municipal jobs and the school system. People also pointed out that rather than a “we’re all in it together” mentality, today people are looking for individual business opportunities. One interview participant told me:

. . . vuelvo a reiterar que antes los ayudábamos nosotros. Hoy en día se terminó eso. Todo es “si no me pagas” o “a cambio de esto”. En esos años un vecino iba y le ayudaba a aserrar y después le tocaba al otro y así. Si había que hacer un bote se ayudaban mucho los unos a los otros, porque había una necesidad de hacerlo. (P05)

This same interview participant draws a connection between “outside influence” and the change in lifestyle in Tortel:

Se habla bonito de que en Tortel mantenga su idea, mantenga su cultura, pero siempre hay gente que quiere que cambiemos, cambiamos, cambiemos y a lo último están diciendo cosas falsas y si no cambias te van dejando de lado o terminamos discutiendo entre nosotros mismos y eso es lo malo. . . . Se habla mucho que se respetan los colonos, los hijos de los colonos, pero es un decir no más. They speak prettily about how Tortel maintains its essence, maintains its culture, but there are always people that want us to change, change, change and ultimately they’re saying falsehoods and if you don’t change they’ll toss you aside and we end up fighting amongst ourselves and that is wrong. . . . One says that they respect the settlers, the children of the first settlers, but that’s a saying, no more.
No creo que lo respeten. . . . Y ahí empezamos a no hacerlos respetar porque yo veo que de repente hay cosas que no, que no debían de pasar. Pero eso es porque estamos cambiando muy pronto. Vamos a terminar cada uno viviendo con su metrito cuadrado. Me interesa lo mío y no me importa el resto y eso es perjudicante para un pueblo chico. (P05)

don’t believe that they respect anyone. . . . And we’re beginning to make it such that they don’t respect us because I see that suddenly there are things that shouldn’t have come to pass. But that’s because we’re changing very quickly. We’re going to wind up with everyone living within his own little square meter: “I’m interested in what’s mine and the rest of you don’t matter to me”, and that’s detrimental for a small town. (P05)

In conclusion, it is not an exaggeration to say that all Tortel community members’ lives are intimately connected with ciprés. The tree species was a crucial subsistence resource for the pioneers who first settled in the zona, providing the raw material for fuel, the infrastructure for homesteads, and trade for food and supplies. Over time, the practices of harvesting, working with and commercializing the species generated social customs and cultural artifacts that are unique to the zona. Today, ciprés maintains important material and socio-cultural roles in the Tortel community, however these roles are changing as standing dead ciprés becomes ever more scarce and inaccessible. In addition, political and economic structures that enable some community members to tap into new livelihood strategies reduce the viability of ciprés harvest and sale for others. It seems that ciprés is now more a resource, albeit a limited one, rather than a way of life.

National/International Management Context

In this section, I address the following research question: How is ciprés conceptualized at international and national policy scales and what are the implications for ciprés use in the Tortel area? The goal was to uncover the meanings or significance of ciprés that guide governmental decision-making in order to determine whether they are compatible with the perspectives of ciprés held by local people who harvest or otherwise utilize the tree, as well as the local conditions in which those practices take place. First, I describe some initial findings
that motivated this research question. Then I discuss my approach to analyzing specific texts, followed by the results of discourse analysis.

I initially reviewed agreement/policy documents with the goal of determining whether there is a legal basis for restrictions on ciprés harvest. Throughout this investigation, I have read or been told conflicting information regarding whether or under what conditions it is legal to harvest live or dead ciprés. This information has come from the websites of conservation organizations and peer-reviewed manuscripts regarding various facets of ciprés physiology or ecology, as well as conversations with fellow graduate students who have studied Tortel or ciprés ecology, CONAF employees, and Tortel community members. The only consistent assertion has been that it is illegal to harvest live ciprés, though I have found no documentation supporting this claim. In fact, following my review of the above international and national agreements/policies, it seems impossible to make conclusions about the legal standing of ciprés conservation and management due to conflicts between legal documents. That is, there are conflicts in “the letter of the law”. However, discourse analysis reveals that there are also conflicts in the “spirit of the law”: ciprés is variously treated as a component of biodiversity, a forestry species and/or a cultural icon. In this section, my goal is to illustrate these different conceptions of ciprés and the contexts in which they are formulated. In chapter six, I will return to this subject and examine how the implementation of policies based on such overlapping and conflicting representations of the tree leaves the question of continued use of ciprés by Tortel community members unresolved.

**International**

At the scale of international policy, one policy tool and two treaties are especially relevant to the subject of ciprés use within Chile:
• The International Union for the Conservation of Nature (IUCN) Red List of Threatened Species;
• The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); and
• The Convention on Biological Diversity (CBD)

The IUCN, which was founded in 1948, describes itself as “the world’s oldest and largest global environmental network” (IUCN, “About”, 2011). Ciprés became listed as ‘vulnerable’ within the IUCN Red List of Threatened Species in 1997 (IUCN 2010). Chile has no national committee that participates in the IUCN. During the 1963 IUCN meeting in Nairobi, a resolution was drafted from which emerged CITES (IUCN, “About CITES”, 2011). CITES requires member countries to restrict the “import, export, re-export and introduction from the sea” of selected species (CITES, “Discover CITES”, 2011). The international agreement came into force and was signed by Chile in 1975. At this time, three of Chile’s native tree species (and no other plants or animals then or since) became listed within Appendix I of CITES: alerce, araucaria and ciprés (CITES 2011). The IUCN continues to support the implementation of CITES primarily by contributing scientific and informational support to the process of species listings. Finally, the CBD is an international agreement that came into force in 1993, and was ratified by Chile in 1994. Though ciprés is not specifically mentioned within CBD policy documents, the species falls within the purview of the Convention, whose objectives are consistent with those of the IUCN and CITES (IUCN, “About CITES”, 2011).

The mission statements of the IUCN, CITES and the CBD, respectively, suggest that each agreement/policy is concerned with global biodiversity conservation, sustainable use of natural resources and environmental justice. Given that CITES is the only agreement/policy that specifically applies to ciprés and has also been ratified by Chile, my analysis at the international policy scale is focused on the text of this agreement. I use discourse analysis to reveal the
underlying assumptions, meanings and scales that drive CITES’s regulations, with the assumption that these reflect how species such as ciprés are conceptualized and advanced within the realm of global conservation policy.

Under CITES (alternately, ‘the Convention’), animals and plants are depicted as both economic goods and unique species that are components of the world’s biodiversity. The term ‘biodiversity’ is not actually included in the text of the Convention, but animals and plants are described as “wild” and occurring in “many beautiful and varied forms”. According to the Convention, it is this uniqueness that warrants conservation: animal and plant species are “irreplaceable” and thus “they must be protected” (Preamble CITES). Ciprés has been listed within CITES because its role as a unique species is perceived to be threatened by its role as an economic resource: “Appendix I shall include all species threatened with extinction which are or may be affected by trade. Trade in specimens of these species must be subject to particularly strict regulation in order not to endanger further their survival and must only be authorized in exceptional circumstances” (Art. II CITES). It should be noted that CITES regulations are not simply driven by the idea that non-human species have intrinsic value. Rather, animals and plants are perceived to have both material and less tangible significance as well. According to the text of the Convention, the Parties are “Conscious of the ever-growing value of wild fauna and flora from aesthetic, scientific, cultural, recreational and economic points of view” (Preamble CITES). This valuation affects the scale at which the Convention operates.

Multiple scales are implicated in the protection of animals and plants via CITES. The justification for protection is linked to global and temporal scales: flora and fauna are perceived to be “part of the natural systems of the earth which must be protected for this and generations to come”. However, the process of protection is linked to international, national and even local
scales. The text of the Convention states, “. . . international co-operation is essential for the protection of certain species of wild fauna and flora against over-exploitation through international trade” (Preamble CITES). Thus, global solutions are posed for global problems. However, the need for regulations at more proximate scales is also asserted: “. . . peoples and States are and should be the best protectors of their own wild fauna and flora” (Preamble CITES). This recognition may emerge from how the subject of protection is depicted. The text of the Convention alternately focuses attention on “wild flora and fauna” in general or “certain species” more narrowly. Indeed the agreement works on a species-to-species basis with the intent that doing so across the globe will promote the overall conservation of biodiversity.

CITES’s species-level decision-making process requires that factors spanning international to local scales are taken into account. Several Annexes were added to the Convention in 1992 that specify the biological and trade criteria to be used for species listings with the goal: “. . . to ensure that decisions to amend the Convention’s Appendices are founded on sound and relevant scientific information. . . .” (Preamble Conf. 9.24 CITES). The biological criteria encompass local conditions. For example, species listings must take into account factors such as population and sub-population size and distribution, as well as habitat inventories, including quality and spatial extent (Annex 1 Conf. 9.24 CITES). Trade criteria are referenced in terms of national and international scales (Annex 6 Conf. 9.24 CITES). However, as of the 15th Conference of the Parties, local livelihoods entered the scope of the Convention. A working group has been charged with completing a rapid assessment toolkit to be used by national governments to identify “. . . the positive and negative impacts of implementing CITES listing decisions on the livelihoods of the poor. . . .” (CITES, “CITES and Livelihoods”, 2011). That the Convention is expanding its focus in this way suggests that in the future species could be
evaluated not only on their biological roles at global to local scales, but on their socio-economic roles across these scales as well.

No investigation of social justice preceded the listing of ciprés. The tree was once one of Chile’s timber exports (Durán 2006) and thus, in some sense, a ‘global’ resource. Its listing in Appendix I of CITES effectively subsumed ciprés within the paradigm of species protection and turned the tree into a crucial component of global biodiversity. I will later return to this idea and the question of what actors have been affected by this change in conception and how.

**National**

Chile’s national policy scale encompasses three different “arenas” that are relevant to ciprés use: Forestry, Environmental Protection and National Heritage. I address each arena in chronological order. That is, ciprés was first (and is perhaps foremost) the subject of Chile’s forestry sector, while it has only recently become the focus of national heritage.

**Forestry**

Recently, regulations guiding Chile’s forestry sector have experienced a dramatic shift in how native forests are conceived and managed. In 2008, the Native Forest Law was passed after 15 years of debate in the legislature. This law effectively replaces the Forest Law of 1931, which had served as the principal source of forest management provisions since it was implemented, though substantial amendments were made in 1974 (via Decree Law 701) and other adjustments followed in subsequent years. In this section, I first discuss the conceptions of forests and tree species, such as ciprés, that are advanced through the 1974 version of the Forest Law (hereafter ‘DL 701’). Then I focus on how these conceptions have changed via the Native Forest Law.
The text of DL 701 establishes a discourse regarding forests and their management that is based on narrow and technical definitions constructed to reflect human use. For example, regardless of whether they are vegetated, areas can be considered ‘preferable for forestry’. This is because a forest is not recognized as a complex ecological community, but rather an area of land possessing a few specific characteristics and dimensions. A forest is defined as a “site populated with vegetative formations in which trees predominate and occupy an area of at least 5,000 m\(^2\), with a minimum width of 40 m, with a canopy cover greater than 10% of the total area in arid and semiarid conditions and 25% in more favorable circumstances”. This policy also establishes forests as low-priority land cover types. Areas preferable for forestry, “. . .exclude those areas that can be used for agriculture, fruticulture or intensive ranching without suffering degradation” (Art. 2 DL 701).

A slightly more complex understanding of forests emerged in 1980. Supreme Decree 259 (DS 259) amended DL 701 by defining twelve native forest types, one of which was Ciprés de las Guaitecas. By assigning forest types based on the presence of dominant tree species, this policy acknowledged that forests vary in their composition. However, forest type definitions were still narrow and technical. According to the text of DS 259, the ciprés forest type “. . .is that which one encounters in pure stands or with other species, represented by at least 10 individuals of the species per hectare, each one greater than 2 m in height” (Art. 19). In addition, the stated purpose for creating these definitions was “to determine the method of cut or exploitation of native forests” (Art. 19 DS 259). A utilitarian perspective has guided forest use and management in Chile until a few years ago (Clapp 1998, Neira et al. 2002, Durán 2006).

The Native Forest Law of 2008 substantially alters how native forests are conceived and managed. As its title suggests, the law prioritizes the management of native forests over
plantations. It also expands definitions of forests and their components to include principles of biology and ecology, and allows for a variety of management objectives beyond harvest. In fact, the Native Forest Law claims to be focused on forest conservation, including the activities of protection and restoration. According to Article 1, “The objectives of this law are the protection, recovery and improvement of native forests, with the goal of ensuring sustainable forestry and environmental policy”.

The definitions included in the Native Forest Law appear to support the law’s stated objectives. While ‘tree’ and ‘forest’ are still described in technical terms – in fact the definition of forest is the same as in DL 701 – ‘native forest’ is described with reference to ecological properties such as distribution and regeneration, and a distinction is made between native and exotic species (though the haphazard presence of non-native species does not exclude an area from being considered a native forest). Native forests are classified into three different types: native forests of preservation, native forests of conservation and protection, and native forests of multiple uses. The language used to describe these native forest types reflects varying conceptions of native forests and their constituents.

A cursory examination of ‘native forests of preservation’ suggests that native forests are seen to be important for supporting ecosystems, biodiversity conservation and (potentially) national heritage. “Regardless of area”, native forests of preservation are recognized to be those forests that “currently serve as or compose habitat” for vegetative species that are legally protected or classified in certain ways (Art. 2, Para. 4, NFL). Besides ‘habitat’, native forests are sites of biodiversity: forests of preservation are also defined as “environments that are unique or representative of the natural biological diversity of the country, whose management can only occur with the objective of safeguarding that biodiversity” (Art. 2, Para. 4, NFL). However, the
language used to link native forests with ‘habitat’ and ‘biodiversity’, respectively, suggests that these associations are superficial. For one, the notion of native forests as habitat is conditional – it seems to hinge on the presence of threatened species. ‘Biodiversity’ is not defined in the text of the Native Forest Law, but as used above, it could pertain more to national heritage rather than ecological functioning.

The definitions of the other two native forest types are technical and neither alludes to forest ecology or biodiversity. ‘Native forests of conservation and protection’ are those whose harvest threatens water and soil resources, while ‘native forests of multiple uses’ “are preferably destined for securing timber and non-timber products and services” (Art. 2, Para. 6, NFL). It seems, then, that there is a dichotomy within the Native Forest Law: some native forests serve the purpose of protecting non-human nature, whereas others serve the interests of humans, either by maintaining ecosystem services (e.g., water quality) or serving as raw materials. Within the law, ecosystem services are only defined in terms of environmental quality; no mention is made of the less tangible benefits that forests can confer to humans, such as social or cultural meanings. The dichotomy in the goals of forest management – non-human versus human benefits – is also reflected in language pertaining to management plans: there are “preservation management plans” and “forest management plans”. The idea that timber harvest may occur in forests that also serve (or should serve) as habitat and contribute to ecosystem functioning does not seem to be included in the Native Forest Law. The concept of “national heritage” could bridge the two perceptions of native forests, but this concept is neither well developed nor stated explicitly within the text of the Native Forest Law. Ultimately, forests and individual species such as ciprés are alternately conceived as habitat for threatened species or threatened species themselves, or as sites of timber extraction or forest products.
The only explicit mention of scale in relation to the motivations driving the Native Forest Law is the goal of protecting nation-wide biodiversity or “ecological heritage”. Most references to scale are made regarding the implementation of forest management activities: national, provincial, regional, and local scales are implicated in this process. For example, the Native Forest Law establishes several national funds and a national council for assistance in meeting its objectives. The council and the fund for scientific research support decision-making at the national scale. Other research and development tools occur at more proximate scales: the Native Forest Law proposes to develop a public system of information regarding approved management plans that will be consolidated by provinces; and the mapping and characterization of native forests for preservation or conservation will occur by regions. Of course, forest management activities, such as preservation, conservation, restoration or timber harvest actually occur at local levels. The text of the Native Forest Law specifically refers to local conditions – after all, managing these conditions is the primary method for obtaining the law’s objectives – however, it also specifically defines and includes provisions for “small forest proprietors” (or local land owners) (Art. 2, Para. 17, NFL).

It is important to note that the Native Forest Law takes (the usual) hierarchical approach to forest management: activities are planned and occur on a project-by-project basis, but are directed by regulations concocted at the national scale with the goal of application across projects. There is an implicit assumption that nationwide benefits will accrue from protecting biodiversity and environmental quality, and/or allowing the extraction of forest products at the scale of management implementation. However, this perspective is not accompanied by norms that focus on how management activities are distributed across scales intermediary to that of the project or the nation. For example, there is no notion of a “landscape scale”. This could be
problematic if forest management plans and their goal of “native forest use for obtaining forest and non-forest products” (Art. 2, Para. 18, NFL) are applied overwhelmingly over a given area as opposed to preservation management plans, which are meant to “to protect biological diversity, and assure the maintenance of the conditions that make possible the evolution and development of the species and ecosystems contained in the area to which applied” (Art. 2, Para. 18, NFL). Thus, while the scope of individual management plans may encompass local conditions, this may not be enough to ensure that the stated objectives of the National Forest Law are met.

The definitions of forests and the scales at which they are managed under the Native Forest Law have implications for whether ciprés is perceived to be and managed as a threatened species or a forestry resource. Under the original Forest Law and its subsequent amendments, ciprés was a forest type defined by the presence of a specific number of ciprés trees per hectare and the type of harvest permitted (i.e., selective logging). Today, ciprés could be seen as a native forest type that consists of or harbors threatened species and thus warrants preservation. Alternately, it may be the subject of a forest management plan that confers the use of ciprés wood to specific actors (including small land owners). Whether ciprés is the subject of preservation or management hinges upon legal definitions of threatened species. I will return to this subject and address how it affects the potential for ciprés to be a livelihood resource for local people, such as Tortel community members.

Environmental Protection

Chile’s first comprehensive environmental law, the Environmental Framework Law (Law 19.300; hereafter ‘EFL’) was adopted in 1994. The EFL establishes general criteria for the country’s environmental policy, a system of environmental impact assessment, and a national
institution (National Environmental Commission, or CONAMA) for overseeing environmental policy and review.

The overarching goal of the EFL is to support the following: “The right to live in an environment free of contamination, the protection of the environment, the preservation of nature and the conservation of environmental heritage” (General Provisions). While specific tree species, such as ciprés, are not mentioned within the EFL, the opening statement above coupled with the law’s definition of ‘biodiversity’ indicate that ciprés, as a biological entity, falls within its sphere of influence. According to the EFL, ‘biodiversity’ includes the “diversity within the same species, between species and between ecosystems” (Art. 2, Part a). Biodiversity protection is explicitly mentioned as an objective within the text, however this process and the human use of nature are not described as mutually exclusive. In fact, throughout the EFL the environment and specific constituents of the environment are mentioned not only in terms of their intrinsic value, but also in terms of their multiple uses/values for humans. For example, the ‘environment’ is understood to include natural, artificial and sociocultural elements and their interactions (see Art. 2, Part II, EFL). Some aspects of the environment are recognized to be of special importance to humans: ‘natural resources’ are defined as “the components of the environment that are susceptible to being used by human beings for the satisfaction of their spiritual, cultural, social and economic needs and interests” (Art. 2, Part r, EFL).

The protection of the environment and non-human nature are thus justified, in part, for the purposes of contributing to national heritage and sustaining the well-being of humans in general. The ‘conservation of ecological heritage’ includes the sentiment that it is important to conserve components of the environment that are unique to Chile (Art. 2, Part b, EFL). Meanwhile, ‘sustainable development’ is defined as “the process of sustained and equitable
improvement of people’s lives, founded on appropriate methods of conservation and protection of the environment, in a manner that does not compromise the expectations of future generations” (Art. 2, Part g, EFL). Thus, not only do humans need and want to use nature, but perhaps they should use nature.

That there are feedbacks between humans and the environment within and across scales is recognized via the language used to define ‘environment’: “the global system constituted by natural and artificial elements. . . and their interactions, in permanent modification by human action or natural, and that apply and determine the existence and development of life in its multiple manifestations” (Art. 2, Part ll, EFL). This perspective of the EFL seems to be reflected in the scale at which the law is implemented. Management plans are meant to be developed – and are subsequently subject to the environmental review process – for all activities that potentially impact the environment. While such activities are “local” in origin, they are understood to have “non-local” effects. Activities or projects that have relatively contained footprints such as various types of structures (e.g., airports) to those with relatively disperse footprints such as industrial forestry activities or the extension of urban zones require the creation of environmental impact assessments if they threaten the General Provisions of the EFL. Perceived threats are not limited to the degradation of natural resources or endangerment of threatened species (despite the emphasis on preventing these occurrences throughout the EFL). Environmental review is also warranted when human well-being is threatened. Human well-being is broadly understood to include health, access to places of meaning or value, and certain human-made structures. The following are some of the more surprising “effects, characteristics or circumstances” that warrant environmental review: “reestablishment of human communities, or significant alterations in systems of life and customs of human groups”, “significant alteration,
in terms of magnitude or duration, of the landscape or touristic value of a zone”, “alteration to monuments, sites that are anthropological, archaeological, historic and, in general, pertaining to cultural heritage” (Art. 11 EFL).

Given the above statements about biodiversity and human well-being, the EFL’s take on ciprés may be interpreted as follows. The use of ciprés for livelihood and/or socio-cultural purposes is encouraged. However, given the desire to protect the environment (i.e., ecosystem services) for ongoing human use, the use of the tree can be subject to the environmental review process. Furthermore, as one of Chile’s tree species, ciprés is an important component of the nation’s environmental heritage, and will automatically be excluded from management activities if it is officially classified as a threatened species.

Cultural Heritage

On May 23, 2001, Caleta Tortel received Zona Típica (“Typical Zone”) status via Declaration 282. Such decisions are made by Chile’s National Monument Council (CMN), which resides within the Ministry of Education. By law, the CMN is meant to award Zona Típica status to urban or rural places that contain outstanding architecture (by style, material or technique) that is representative of the development of a human community. In addition, the built and natural landscapes of such places are meant to be linked harmoniously such that they form a unique local environment which “defines and grants historic and urban identity to a locality, town or city” (CMN 2006, p. 2). Furthermore, the protection and conservation of the so-called “typical” aspect of such places is meant to “assure cultural development, tourism, the enjoyment and general well-being of the community, all of which allows the investigation, education and valuation of a specific historic and cultural manifestation” (CMN 2006, p. 2).
According to the text of Declaration 282, Tortel’s Zona Típica status is based on the above norms. Discourse analysis reveals the ways that ciprés figures into the considerations used to make the award, which are listed as follows in the order in which they appear in the policy document: 1) the town is located in an area designated for tourism development; 2) the town has a unique history, the vestiges of which are still present; and 3) the town’s architecture is an outstanding representation of its history and blends harmoniously with the surrounding environment. Unpacking each consideration in turn indicates that ciprés is simultaneously described as a biological entity, forestry species and cultural icon.

Tourism is linked primarily to the presence of impressive landscape features (e.g., “the deepest river in Chile”, or “the largest reserve of fresh water in the world”). The existence of forest, shrub and animal species is also included; however, while the text notes the uniqueness of the animals, it does not do so for the area’s vegetation: “. . .where mountains, glaciers, rivers, lakes and forest and shrub species and a variety of fauna unique to the area interact”. There is no implication that ciprés – or any other tree species – is a special component of the area’s natural environment that does or could attract tourists.

However, ciprés is specifically mentioned in relation to Tortel’s history and architecture. The initiation of Tortel as an encampment for settlers and port for shipping ciprés posts is recognized. Interestingly, the town’s geographic location is situated as follows: “. . .a wood-workers camp in the middle of peat bogs containing ciprés groves. . . .” Similarly, ciprés is noted to be a species of conservation concern even as its wood is described as an important material component of the town’s architecture: “. . .the road structure of the town has been growing based upon a network of boardwalks that are created entirely with wood from ciprés de las Guaitecas, a protected forestry species. . . .” That ciprés is both a component of the natural
environment and a material resource is foundational to Tortel’s Zona Típica status because these simultaneous representations of the tree reflect “the harmonizing and promoting relationship that should exist between a natural space and a built thing”, according to the CMN (2006, p. 2). That ciprés is a protected species probably contributes to the conception of Tortel as a unique place. However, there is no attempt to resolve the notion that Zona Típica status impels Tortel to maintain its style of architecture and thus to continue to use ciprés in the construction of town infrastructure and personal dwelling, activities which place increasing pressure on an already-scarce resource and the habitats in which it is found.

A Politicized Species

Drawing upon the above analyses, it is apparent that ciprés is not just a biophysical entity, nor even simply a biological one. Rather, ciprés is a component of a politicized nature – it exists at the confluence of multiple discourses that are advanced at different scales and with different imperatives when it comes to human use of the environment. At the global scale, ciprés is protected as a constituent of the world’s biodiversity. At the national scale, ciprés may either be a protected component of the environment, managed as a forestry resource or integrated into Chile’s cultural heritage. In this section, I explore whether and how these discourses are conflicting and what this means for the people of Tortel.

The four policies analyzed in this section may be seen to reflect different ‘scales of interest’ regarding ciprés. These scales are formed by the overarching agendas held at different policy levels (i.e., international, national) and pertaining to different subjects. They include the global biodiversity scale, the national environmental conservation scale, the national forest management scale, and the national heritage scale. These scales differ to varying degrees in their overarching discourses, though biodiversity protection appears to figure into each of them. In all
cases, their applicability to ciprés harvest in Tortel depends on the process of implementation: whether management decisions hinge on species-level evaluations, and if so, whether ciprés is classified as a threatened species.

Of the discourses generated at national scales, that of the environmental conservation scale is most similar to the discourse of the global biodiversity scale. Both call for the protection of biodiversity and argue that doing so is warranted based on the intrinsic value of animals and plants, but they also acknowledge that the natural world holds material and less tangible value for humans. At the global scale, biodiversity conservation has been prioritized over other the other potential uses of animals and plants, and this is reflected in the policy’s application. Ciprés was supposedly evaluated in terms of its population biology and subsequently listed under Appendix I of CITES because its role as an economic good was judged to be threatening its role as a unique component of the natural world. Though the link between species listings and local livelihoods is now under consideration, no provisions of CITES have yet been amended based on this idea. In contrast, the national environmental policy scale is much more concerned for the potential for humans to benefit from direct use of the environment. Within the EFL, animal and plant species comprise biodiversity, but they are also natural resources. Rather than species-based decision-making, the EFL calls for the evaluation of projects and these evaluations are not based solely on whether threatened species are present at a project site.

Biodiversity conservation is also called for at the scale of national forest management. As within CITES, the Native Forest Law gives the impression that biodiversity must be “treasured”, though in the former case, animals and plants are a global treasure and in the latter case they are a national treasure. Like the EFL, the Native Forest Law ultimately grants more attention to human use of resources. After all, this is a policy for managing the forestry sector.
That the policy uses language alluding to biodiversity protection is surprising, but such language is not seamlessly integrated into the document. Even ideas regarding the biological/ecological attributes of forests and their constituents figure into only some of the law’s provisions. Overall, there is a tension between protection and management. While the Native Forest Law only prioritizes the protection of species that have been classified as threatened, the presence of such species converts forest classification and/or projects from those of “management” to those of “preservation”. Thus, at the national forest management scale, there is also a tension between implementation on a species-level basis versus a project-level basis.

The scale of national heritage overlaps with the scale of national environmental protection. In fact, the policies guiding the activities of the National Monument Council refer specifically to the EFL (see Law 17.288 Norms Related to National Monuments, p. 49). Biodiversity protection is thus advanced along the same lines in both the EFL and the legal framework driving Tortel’s Zona Típica status. However, the language used in the declaration of that status is focused much more on the cultural aspects of national heritage rather than the environmental aspects of national heritage. While ciprés is acknowledged to be a protected species and a forestry species, these are not the driving conceptions of ciprés. Tourism is not linked to Tortel given its location in a “zone of ciprés” (as one Tortel community member described the area). Rather, the draws for tourists are articulated as the impressive scenery that one witnesses while strolling amidst exemplars of the town’s unique and impressive architecture. That Tortel’s pasarellas are made from ciprés wood is almost beside the point, except that this detail speaks to the historical and cultural origins of contemporary Tortel.

What do the various scales of interest and their policies regarding ciprés suggest about the continued role of this politicized species in lives/livelihoods in Tortel? At the scale of
national heritage, it seems that the continued use of ciprés wood is crucial to the maintenance of Tortel’s *Zona Típica* status. (Note: I have not been able to find the document that guides “interventions” in the status of Tortel and would mandate the materials to be used to maintain that status.) The EFL would support this effort on the grounds that ciprés is important for the aesthetic, social and cultural well-being of local people as well as other Chileans. However, if the continued use of ciprés were to threaten natural resources such as air, water and soil, a case could be made for regulation; evaluation would occur on a project-level basis. The EFL is currently ambiguous as to the import of the status of individual species on project evaluations. On the one hand, provisions call for classifying species and maintaining species inventories. On the other, it is unclear how the presence of threatened species affects either environmental impact assessments or the development of management plans. Ciprés was not listed as a threatened species within the first of three rounds of species classification instigated by the EFL and conducted by CONAMA (CONAMA 2009). This is surprising given that CONAMA claims to base its decisions on the same criteria used in the IUCN Red List of Threatened Species.

At the scale of national forest management, given the language of the Native Forest Law, ciprés could either be subject to protection and thus removed from use by local people, or it could continue to be managed for human use. The Native Forest Law called for classification of individual species independently of the EFL. As a result, Resolution 586 was passed in 2009, according to which species listings are based on CONAF’s 1989 Red Book of Threatened Species. Ciprés is not listed in that document. Thus, ciprés harvest continues to be subject to management plans that are enforced by CONAF. These plans operate on the project scale, which in the Tortel area, translates into management of individual properties. Thus, the harvest of ciprés for maintaining Tortel’s *Zona Típica* status does not receive specific management.
Finally, though ciprés is classified as threatened via CITES and though the policy is implemented accordingly, this trade agreement does not appear to directly affect current ciprés use in Tortel. The regular shipment of postes to Punta Arenas was occurring when CITES was first implemented. Given that the large ranches throughout Tierra del Fuego, including the Argentine side, generated demand for these ciprés fence posts, it could be that CITES was initially problematic for some actors engaged in the sale of ciprés, though this would not necessarily have affected ciprés extraction by Tortel community members. The more interesting demonstrable effects of ciprés’ inclusion in Appendix I of CITES are as follows: this fact is cited in the scientific literature as justification for why it is important to study the tree species, including the potential need for its conservation; and environmental NGOs use this international status to call for protection of the species.

The ambiguity of how and whether ciprés should be conserved or managed according to the above multi-layered policies appears to trickle down to the local level. Most noticeable are the conflicting messages regarding ciprés harvest that are advanced by CONAF on the one hand and Tortel’s Municipality on the other. CONAF employees are actively discouraging the harvest of ciprés even though the harvest of both live and dead individuals is permitted under the law if accompanied by a management plan. Recall that in the Tortel area, people need the help of CONAF officials in order to prepare these documents, thus they are very much subject to the decisions of local authority regardless of what is included in national law. It may be that the forestry commission has been pressured by the scientific and environmental communities in response to the CITES and IUCN Red List listings of the species. In this case, the capacity of local people to continue to access and use ciprés is at the whim of multiple groups of socio-political actors.
While CONAF discourages ciprés harvest, the Municipality is the most dependable buyer of ciprés wood next to the intermediary in Punta Arenas who purchases the barcaza shipments, and it also pays better and accepts the more readily-available diameter size classes of ciprés (i.e., rollizos). Some research participants implied that the Municipality acts like a parent who doles out resources to its children – just enough to maintain their dependence on its support. It is unclear whether the Municipality is responding to the Zona Típica status in its purchase of ciprés wood, or if this is a technique for supporting those individuals who still harvest the tree in order to generate the majority of their income.

Rather than confusion over the state of the ciprés resource, most Tortel community members with whom I conversed expressed anxiety regarding the obvious end of the resource (due to a limited number of harvestable trees) and frustration at their lack of access to other resources or livelihood options. Research participants did not seem torn by CONAF’s message to stop harvesting and the Municipality’s message to continue. Instead, I got the sense that people are going to continue to harvest ciprés, as possible, until they run out of resource, lose connections to viable markets, or encounter better opportunities.
CHAPTER 6: DISCUSSION & CONCLUSIONS

‘Sociophysical Ecological Scales’

In this section, I return to one of Swyngedouw’s (2004) ideas that emerges from historical-geographical materialism: “More importantly, scalar reconfigurations also produce new sociophysical ecological scales that shape in important ways who will have access to what kind of nature, and the particular trajectories of environmental change” (p. 132). I use the concept of sociophysical ecological scales to synthesize the results of this research. In particular, I have developed a theoretical model representing the ‘scale of ciprés harvest/use’ (see Figure 8).

![Figure 8. Theoretical model depicting the sociophysical ecological scale of ciprés harvest/use.](image)

This model captures the idea that environmental change in the Tortel area is not simply due to the actions of local people. Rather, multiple, intertwined ecological and socio-political factors have generated particular – and in many senses, marginal – local conditions that require people to take advantage of the only viable livelihood resources available (in this case, stands of ciprés). The model encompasses the notion that the ciprés resource exists in spatially-explicit patches as a result of biophysical conditions and also socio-political constraints on access (e.g., multi-
layered international and national policies, or the boundaries of private land). Furthermore, the use of the material resource generates biophysical effects that subsequently alter the nature of that resource (e.g., the cumulative effects of ciprés harvest and fire may include a loss of natural ciprés regeneration). Resource use also generates material and less tangible socio-cultural effects (e.g., unique architecture and a “sense of community”).

Future Roles of Ciprés

My research suggests that the changing roles of ciprés in the lives and livelihoods of Tortel community members are driven by feedbacks between several marginalizing factors. Despite the arrival of the Southern Highway, Tortel remains a remote area that is fairly disconnected from the rest of Chile. When people first arrived in the late 1930s, they were obligated to become pioneers or return to their homelands. They turned to ciprés harvest because that was the sole natural resource available. However, the practice only became viable as a source of income generation due to haphazard connections with a remote market for ciprés wood. Livelihood dependence on the harvest of ciprés was then reinforced and maintained given State support (e.g., the construction of the Navy post and Navy-based transport of wood products, and the construction of amenities and public works). This support still exists, though it is now managed at the local level by the Municipality and CONAF. In turn, these entities have displayed limited scope in taking local people’s needs and desires into account and managing local resources such that they are available to Tortel community members over the long term.

Today, ciprés remains a material resource for some members of the Tortel community, and the tree still ties people to the town’s history and is a source of personal and shared pride and meaning. While many people have expressed that they no longer want to harvest ciprés, they still perceive the tree to be a component of the zona and town that makes these places unique.
from other areas of Chile. As more people engage in tourism, seek employment from the Municipality or tap into other forms of livelihood generation, it seems that the “sense of community” in the Tortel area is also changing. Whether and how ciprés can remain a material and/or socio-cultural resource for Tortel community members depends on the following general needs: recognition and appropriate management of local conditions, and recognition and support for local perspectives and knowledge. I believe that the Municipality and CONAF, as the most powerful local socio-political organizers and land managers, are implicated in creating positive change in the lives of local people. I also believe that the people of Tortel need to take initiative to decide whether the ‘legacy of ciprés’ (Steve Siebert pers. comm.) – the combination of ciprés artifacts, historic harvest and homestead sites, and practical knowledge generated through years of harvest/use of the tree species – is worth preserving and how that can be done so as to benefit the community.

Here are some specific recommendations:

- There needs to be a re-examination of ciprés habitat types, and these should be accounted for in management decisions at specific sites. In addition, support is needed for scientific investigations of the impacts of fire, harvest and/or other anthropogenic effects on ciprés habitats in order to determine the long-term impacts of ciprés harvest and whether the practice could be sustainable if the intensity of harvest were altered or whether conservation measures are needed in order to protect ecosystem structure and function.

- The very few stands of mature live ciprés should be inventoried and their protection encouraged through a program of environmental education and awareness. This program might link the notion of environmental heritage to that of cultural heritage in order to generate a sense of pride not only in the products that come from ciprés, but their unique habitats as well.

- The ciprés resource base needs to be re-evaluated based on a quantitative inventory of dead ciprés. The results of such an inventory should be made with input from all Tortel community members, and should be available to inform decisions made by local people, CONAF and the Municipality. Given the desires of local landowners, the potential for managing regenerating ciprés stands for subsistence use at the household scale should also be considered.
The relationship between Tortel’s *Zona Típica* status and the intensity of ciprés harvest needs to be investigated to determine whether the status is applying extra pressure to an already-limited resource.

The decision-making processes of both CONAF and the Municipality need to be held accountable in terms of their equity. Furthermore, both organizations should strive to integrate local perspectives, knowledge and abilities into their management and development decisions. For example, both organizations need to evaluate whether their “capacity-building” programs are effective and who benefits and who does not.

There needs to be a public forum in which Tortel community members can discuss how the scarcity of ciprés has affected their lives and whether there are choices that they can actively make in the interest of maintaining particular socio-cultural traditions and values. For example, in what ways can individuals continue to use the resources on their properties in order to support themselves? Could sustainable resource use be fostered by initiating a cooperative business based on the creation and sale of value-added wood products? Alternately, is there a way of integrating tourism with the ‘legacy of ciprés’, such as through ‘historical’ or ‘heritage’ tourism, thereby preserving relationships between the Tortel community and the tree species?

These recommendations are based on the premise that the considered use of local conditions and local livelihoods should form the basis for conservation and management endeavors, whether those originate at global or local decision-making levels. Over the course of four months in the Tortel area, I was inspired by the feats people once accomplished in order to survive in that remote environment. I was also impressed by the tangible sense of change that has overcome the whole Baker *zona* and that was articulated by participants in this study. As earlier in their history, the people of Tortel want assistance in achieving a higher quality of life. Instead of being handed a uniform solution, they need to be given tools and guidance with which to make choices for themselves.
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APPENDIX A
Interview Guide

Note: When I began conducting interviews, I needed to follow the interview guide closely to ensure that my Spanish was intelligible and that I was covering the desired topics. Later, the course of the interviews became more free-form. Slightly different versions of the interview guide were used depending on the age and experiences of the research participant.

Spanish

Bibliografía:

1) A que se dedica (en que trabaja)? (O, a que se dedicó?)
2) Por cuánto tiempo ha vivido usted aquí en la zona y en este campo? Y su familia, cuando llegaron en la zona? Quienes llegaron, sus abuelos, padres u otros? De donde vinieron ellos?
3) Usted se considera a su mismo un pionero? Porque? Que significa ser un pionero?
4) Podría contarme más de su historia y la de su familia? Porque vinieron acá? Que hacían cuando llegaron a la zona? (Trabajaban con ganado, madera?) Como escogieron el lugar donde decidieron vivir? Había otras familias cerca? Quienes?
5) Como era la vida cuando llegaron usted y la familia a este lugar? Que fue lo que les gusto del lugar y en su campo specifically? Porque? Que no les gusto?
6) De qué manera les cambio la vida con tiempo? Fue para mejor o peor? En qué sentido?

Madereando – antes:

7) Usted se considera a su mismo un maderero? Porque? Que significa ser un maderero? Es importante a usted ser maderero? Por cuánto tiempo ha trabajado en madera usted (madera del ciprés u otros especies también?)
8) Me podría contar como eran las características del ciprés cuando usted y su familia llegaron a su campo? Por ejemplo, habían cipreses de tamaño y diámetro grande (seco y verde)? Como era la altura que tenían los cipreses? Como era la distribución del ciprés—fue ubicado por todos lados, en manchas? Me podría contar de la cantidad del ciprés que había en el lugar cuando usted llegó? Habían signos de incendios o bosques quemados? Habían muchos renovales en su campo cuando llegó? Me gustaría saber si ha cambiado la vegetación y/o la turba en todos estos años que usted ha vivido en este lugar – de que manera?
9) Cuando empezó usted o su familia hacer madera aquí? Cuantas personas trabajaban en madera en su campo? Como era el acceso al ciprés cuando usted llegó a la zona? Que hicieron usted y su familia con la madera? (Como la usaron en su campo? Donde la vendieron)? Me puede contar como se sacaba el ciprés de su campo y de la zona--que medios de transportes se utilizaban para el traslado? Me podría contar más o menos la cantidad de madera que ustedes sacaban? Fue su sustento dependiente en el trabajo de la madera del ciprés?
10) En qué sentido fue madereando mas difícil antes?

Madereando – hoy día:
11) Hoy día, la extracción de ciprés es más importante a usted que otros tipos de madera u otro tipo de trabajo? (O sea, que es el rol del ciprés en su vida hoy día?) Porque? Y la extracción de ciprés es más importante que otra forma de trabajo? Porque? Cuanto tiempo lleva usted trabajando en madera (en un mes, cuantos días trava, más o menos)?

12) Me podría comentar como es sacar y hacer madera hoy día y como ha cambiado el trabajo en madera de ciprés? Cuáles son las dificultades para trabajar en madera hoy día? (Como ha cambiado el acceso y la disponibilidad del ciprés?) Que recursos tiene usted para hacer su trabajo? Y hay algunos que le faltan? Cuáles?

13) Dónde saca y vende madera hoy día? (Vende postes, rollizos, que mas?)

14) Es usted asocio? Que hace la asociación? Es mejor estar un asociado? Porque?

15) Que otras alternativas de vender madera tiene que no sea la embarcaza?

16) Yo sé que hay un ley del bosque nativo – ese ley ha afectado su vida (su capacidad a trabajar)? De qué manera? Ha trabajado usted conjunto con alguien de CONAF? Me podría contar de sus experiencias así? (Que piensa usted en el uso de las guías?)

17) Cuáles son las oportunidades para trabajar en otros tipos de madera? (Es usted participante en la programa Tortel III – me podría contar más de esa programa y como ha cambiado su vida?) Le gustaría hacerlo? Porque?

18) Cuáles son las oportunidades para trabajar en otro tipo de trabajo? Le gustaría tener otro tipo de trabajo? En que prefiere trabajar? Porque? Que necesita usted para hacerlo?

19) A usted le parece que faltan unas destrezas o unos recursos para mejorar su vida o para surgir?

La vida cotidiana y el futuro –

20) A Ud., que significa ser un parte de la Comuna de Tortel? En qué sentido piensa usted que Tortel es distinto del resto de la región de Aysén y de Chile?

21) Como cree usted que ha cambiado la vida en los últimos años en Tortel? Ha cambiado las relaciones entre la gente? Como y porque?

22) A usted, como parece la importancia que tiene ciprés a la comuna de Tortel hoy día? Como ha cambiado después del tiempo? Pensando en la gente que no son madereros – que es el rol del ciprés en sus vidas? Como usan ciprés la gente que no son madereros?

23) A usted le parece que todo el mundo está preocupado por la escasez del ciprés? Conversa mucho la gente sobre la tema? Qué dice?

24) Según usted, debe continuar el ciprés siendo un recurso importante por la comuna de Tortel? Tiene idea de cómo puede ocurrir? (Conservación, plantar. . . )

25) Que es el rol del Municipio en la vida cotidiana? El municipio puede ayudar la gente a generar nuevas oportunidades por trabajo—de que manera, podría contarme un ejemplo?

26) En su opinión cuales recursos y/o destrezas le faltan más la gente de Tortel?
1) To what are you dedicated (in what do you work)? (Or, to what were you dedicated?)
2) For how much time have you lived in the *zona* and on this *campo*? And your family, when did they arrive in the area? Who arrived? Your grandparents, parents or others? Where did they come from?
3) Do you consider yourself a pioneer? Why? What does it mean to be a pioneer?
4) Could you tell me more about your history and that of your family? Why did they come here? What did they do when they arrived in the *zona*? (Did they work with livestock, wood?) How did they choose the place where they decided to live? Were there other families close by? Who?
5) What was life like when you and your family arrived here? What did you and your family like about the area and on your *campo* specifically? Why? What didn’t you like?
6) In what way have your lives changed over time? For better or worse? In what sense?

*Madereando* [Harvesting wood] – in the past:
7) Do you consider yourself a maderero? Why? What does it mean to be a maderero? Is it important to you to be a maderero? For how much time have you harvested/worked with wood? Ciprés wood or other species as well?
8) Can you tell me the characteristics of the ciprés when you and your family arrived at your *campo*? For example, were there cipréses of large height and diameter (dead and alive)? How tall were the ciprés trees? What was the distribution of ciprés – located all over the place or in patches? Could you tell me of the quantity of ciprés trees that were located in the place where you arrived? Were there signs of fires or burnt trees? Where many regenerating trees on your *campo* when you arrived? I would like to know if the vegetation and/or the peat has changed in all of the years that you have lived in that location – in what way?
9) When did you or your family begin to harvest/make wood here? How many people worked in wood on your *campo*? What was the access to ciprés like when you arrived in the *zona*? What did you and your family do with the wood? (How did you use it on your *campo*? Where did you sell it?) Could you tell me how you took out ciprés from your *campo* and from the area? (What types of transportation did you use to move it?) Could you tell me, more or less, the quantity of wood that you used to take out? Was your livelihood dependent on working with ciprés wood?
10) In what sense was working in wood more difficult in the past?

*Madereando* [Harvesting wood] – today:
11) Today, is the extraction of ciprés more important to you than other types of wood or another type of work? (Or perhaps, what is the role of ciprés in your life today?) Why? And the extraction of ciprés is more important than other forms of work? Why? How much time have you spent working in wood (in one month, how many days do you work, more or less)?
12) Could you tell me how it is to take out and make wood today and how working in ciprés has changed? What are the difficulties working in wood today? (How has the access and availability of ciprés changed?) What resources do you have to do your work? And are there some that you are lacking? Which?
13) Where do you take out and sell wood today? (Do you sell postes, rollizos, what else?)
14) Are you a member of the association? What does the association do? Is it better to be a member? Why?
15) What other alternatives to sell wood do you have besides the embarcaza?
16) I know that there is a native forest law – has that law affected your life (your capacity to work)? In what way? Have you worked with anyone from CONAF? Could you tell me about your experiences? (What do you think about the use of the guides?)
17) What are the opportunities to work in other types of wood? (Are you a participant in the Tortel III program – could you tell me more of this program and how it has changed your life?) Would you like to be a participant? Why?
18) What are the opportunities to work in another type of work? Would you like to have another type of work – in what would you prefer to work? Why? What do you need in order to do so?
19) To you, does it appear that you are lacking any skills or resources in order to improve your live or get ahead?

Daily life; the future:

20) To you, what does it mean to be part of the *comuna* of Tortel? In what sense do you think that Tortel is distinct from the rest of the region of Aysén and Chile?
21) How do you think life has changed in the last years in Tortel? Have the relationships between people changed? How and why?
22) To you, what is the importance of ciprés to the *comuna* of Tortel today? How has it changed over time? Thinking of the people that aren’t woodworkers – what is the role of ciprés in their lives? How do they use ciprés?
23) To you, does it appear that everyone is worried about the scarcity of ciprés? Do people talk much about this subject? What do they say?
24) According to you, should ciprés continue being an important resource for the *comuna* of Tortel? Do you have an idea about how that can occur? (Conservation, planting, etc.?)
25) What is the role of the Municipality in daily life? Can the Municipality help people generate new opportunities for work? In what way? Could you tell me an example?
26) In your opinion, which resources and/or skills are most lacking for the people of Tortel?