

Exploring Incentive-Based Mechanisms for the Conservation of Gray Whale Habitat in Bahía Magdalena, Mexico

by

Ailish Murphy

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Approval

Name: Ailish Murphy
Degree: Master of Resource Management (Planning)
Report No.: 583
Title : *Exploring Incentive-Based Mechanisms for the Conservation of Gray Whale Habitat in Bahía Magdalena, Mexico*
Supervisory Committee: Chair: Jenna Bedore
MRM Graduate

Duncan Knowler
Senior Supervisor
Associate Professor

Murray Rutherford
Supervisor
Associate Professor

Salvador Garcia-Martinez
Supervisor
Profesor Departamento de Economía
Universidad Autónoma de Baja California Sur

Date Defended/Approved: December 10, 2013

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Abstract

Incentive-based conservation mechanisms are widely recognized as being important for achieving successful conservation on private lands, particularly where the local opportunity costs of conservation are significant. A wide variety of these approaches exist; they have been implemented and reviewed in case studies worldwide. This project reviews incentive-based approaches in the context of conserving gray whale habitat in the Bahía Magdalena Almejas Lagoon Complex (BMALC), Baja California Sur, Mexico. It sheds light on the local social, economic, environmental and institutional conditions related to the ejido and private lands surrounding the BMALC. Fee-simple purchase, easements, leases, payments for land conservation and ecotourism agreements are shown to be potentially effective mechanisms for conserving the private and ejido lands in the BMLAC. A multi-criteria analysis of these mechanisms reveals that there are strengths and weaknesses associated with each of them and that no single mechanism stands out as being optimal for the local situation.

Keywords: Bahia Magdalena; incentive-based conservation mechanisms; gray whale; multi-criteria analysis

*To my dear sister Catherine.
Life challenges us in unexpected ways.
Through example you have taught me
how to stay strong and push through.
Thank you for reminding me that
where there are uncertainties and perceived failures,
lurk opportunities to learn and grow.
Also, thanks for reminding me to have more fun -
you better not forget either.*

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Chapter 1.

Introduction

1.1. Context

Successfully conserving wildlife and wildlife habitats, particularly on private lands, is a complex and challenging endeavour (Doremus 2003). Conservation on private lands is an issue that is gaining considerable attention due to the dramatic rise in the global species extinction rate and the increase in anthropogenic pressures on ecosystems from developments and other activities.¹ The traditional conservation approach, namely, government instituted parks and protected areas, is often not a viable option on these lands. There are numerous historical examples of government expropriation of private lands, or land use rights, for parks and protected areas, particularly in developing countries. However, this conservation approach frequently results in devastating impacts on local peoples, including displacement and loss of livelihoods (see Turnbull 1972; Clochester 1997; Deb Roy & Jackson 1993; Neumann 1998; Jacoby 2001; Roth 2004; Pearce 2005; Turton 1987; Dowie 2005). Moreover, expropriation has often failed to produce both effective conservation incentives and conservation results (Bradon & Wells 1992; Bruner et al. 2001; Adams & Hutton 2007). These factors have caused many conservation organizations to seek and develop alternative conservation mechanisms. Education and regulatory approaches play important roles; however, their ability to achieve conservation success has been limited (Stern 2006; McKenzie-Mohr 2000). It is widely recognized that one of the keys to successful and equitable conservation on private lands lies with policies and tools that create positive conservation incentives for landowners and local communities (Stern 2006).

¹ Species extinction rates are currently estimated to be up to 1000 times the normal background rate (Pimm et al. 1995 IN Brooks et al. 2006)

Landowners and local community members often lack the necessary incentives to conserve because of the uneven distribution of costs and benefits from biodiversity conservation. Most of the benefits of biodiversity are widely dispersed and difficult to capture, while the costs are often borne by a distinct group of individuals in a small geographic area (Balmford and Whitten 2003). In the case of migratory species, the costs and benefits from conservation are generally much more widely dispersed. While society's failure to reconcile these costs and benefits can be partly attributed to the non-rival and non-excludable (public good) characteristics of many conservation benefits (Randall 1987; Dixon & Sherman 1990 as cited in Issacs 2000), several economists and conservation practitioners have demonstrated that positive conservation incentives and results for migratory species can be realized by using creative methods to capture benefits and transfer them to those who face conservation costs (Sultanian & Beukering 2008; Missrie & Nelson 2005).

1.2. Background and Problem Definition

The eastern North Pacific population of the gray whale, *Eschrichtius robustus* (herein referred to as the gray whale), is a migratory species that is dependent on its birthing and breeding habitat in Mexico for its continued survival.² Gray whales spend their summers feeding in the amphipod and krill rich Bering and Chukchi seas. When thick ice starts to cover these feeding areas in the fall, the whales slowly move southward to the sheltered bays and lagoons of Baja California Sur (BSC). The majority of the whales spend winters in three main calving and birthing areas: the Ojo de Liebre – Guerro Negro Lagoon complex; Laguna San Ignacio; and the Bahía Magdalena-Almejas Lagoon Complex (BMALC) (Urbán et al. 2003).

In addition to the gray whale's important existence values (Loomis and Larson 1994, pg. 278), this species plays a key role in maintaining the integrity of several ecosystems (Springer et al. 2003; Bowen 1997; Obst and Hunt 1990) and it provides significant economic benefits to the tourism industry. It is estimated that over two million

² The eastern North Pacific gray whale population is distinct from the western North Pacific gray Whale population is currently estimated at 121 animals (International Whaling Commission 2007a) and the Atlantic gray whale, whose population is extirpated.

people along the west coast participate in whale watching activities each year (Busch 1998).

Historically, the most serious threat to the gray whale came from commercial whaling. Starting in the mid-1800's the gray whale was hunted for its valuable oil (Sayers 1984). By the early 1900s the gray whale was approaching extinction, with population estimates as low as 1500 to 1900 individuals. Although the International Whaling Commission set rules to mitigate whaling activities in 1946, the population continued to decrease (International Whaling Commission 2007b).

Finally in 1982, after much debate, the International Whaling Commission placed a moratorium on commercial whaling (Smith 1984). Also, in the 1970s Mexico's government responded to international pressure to protect the economically important gray whale by designating two of the whale's important Mexican breeding grounds, Ojo de Liebre – Guerrero Negro Lagoon Complex and Laguna San Ignacio, as whale and bird refuges (Dedina 2000). In the 1980s Ojo de Liebre and Laguna San Ignacio were then designated as a biosphere reserve (Dedina 2000). The combination of these policy changes helped the population of gray whales to rebound. Population estimates by the International Whaling Commission indicate that by 1997/1998 the number of gray whales had increased to 26,300 (International Whaling Commission 2007b).

Recent research suggests that gray whales may not be thriving as well as previously thought. While some researchers have estimated a pre-exploitation population of approximately 24,000 individuals (Reilly 1981), a more recent study based on DNA evidence suggests that the historical viable population size may actually have been closer to 78,500 to 117,700 whales (Alter, Rynes & Palumbi 2007). Thus, the current gray whale population may be far below the pre-exploitation level. Furthermore, increased mortality rates of this population in its winter breeding habitat and along its migration routes in recent years indicate the need for an increased focus on gray whale conservation (Le Boeuf et al. 2000). Dedina (2000) points to degradation of winter calving and birthing habitats as the largest current threat to this species.

The gray whale depends heavily on several important areas along the Pacific coast of the Baja California Peninsula for their winter breeding and birthing habitat (Scammon 1981; Urban et al. 2003). Of the three most important areas, the BMALC is the only one that remains unprotected (Rice et al. 1981). One of the largest threats to

the gray whale in the BMALC comes from potential coastal tourist developments and the associated pressures on the bay's ecosystem (Dedina 2000). Disturbance from development would increase the likelihood of gray whales abandoning the lagoons to breed offshore (Findley and Vidal 2002; Reeves 1977). Offshore breeding would expose calves to rougher ocean conditions and potentially higher predation rate by killer whales, which could have a significant negative impact on survival rates of calves and consequently population recruitment (Pérez-Cortés et al. 2000).

Private individuals and corporations, ejidos, and the federal government of Mexico hold the property rights to most of the land surrounding the BMALC.³ While initiatives to protect the federal lands and the marine portion of the bay are currently underway (Gobierno de Baja California Sur 2008), the privately owned and ejido lands remain largely unprotected. Conservation of the private and ejido lands would result in significant costs to local landowners and communities in the form of foregone development opportunities. Meanwhile, the majority of the economic benefits of gray whale conservation would go to domestic whale watching operators and tourists in Canada and the United States (Hoyt 1995).

In order to reconcile these costs and benefits, a percentage of the benefits could be captured (for example, through a fee on whale watching tourists or companies in Canada and the United States) and used to create conservation incentives for those facing the costs of conservation (land owners and communities in the BMALC). Although this market-based conservation approach is somewhat unconventional, it has gained considerable attention. For instance, it has been used in the conservation of Monarch butterfly habitat in Mexico (Missrie and Nelson 2005), and in rationalizing the creation of an international market for the protection of migratory birds (Sultanian and Beukering 2008).

This approach makes rational sense from economic, environmental and social perspectives, but a wide variety of incentive-based conservation mechanisms exist. Literature on these mechanisms identifies general factors that contribute to their successes and failures; however, to date, there are few, if any, studies comparing and

³ Ejidos are communally managed rural lands. This form of land tenure resulted from the Mexican revolution of 1910 and was enacted in the Mexican Constitution of 1917 (Jones & Ward 1998). For more information see Chapter 3.

contrasting these mechanisms for a particular conservation situation. As is evidenced in Chapter 2, none of the incentive-based mechanisms are a panacea. There may be a variety of seemingly appropriate mechanisms, with distinct advantages and disadvantages for each situation. As such, it becomes important to evaluate the options in a comprehensive case-specific manner in order to generate sound policy guidance.

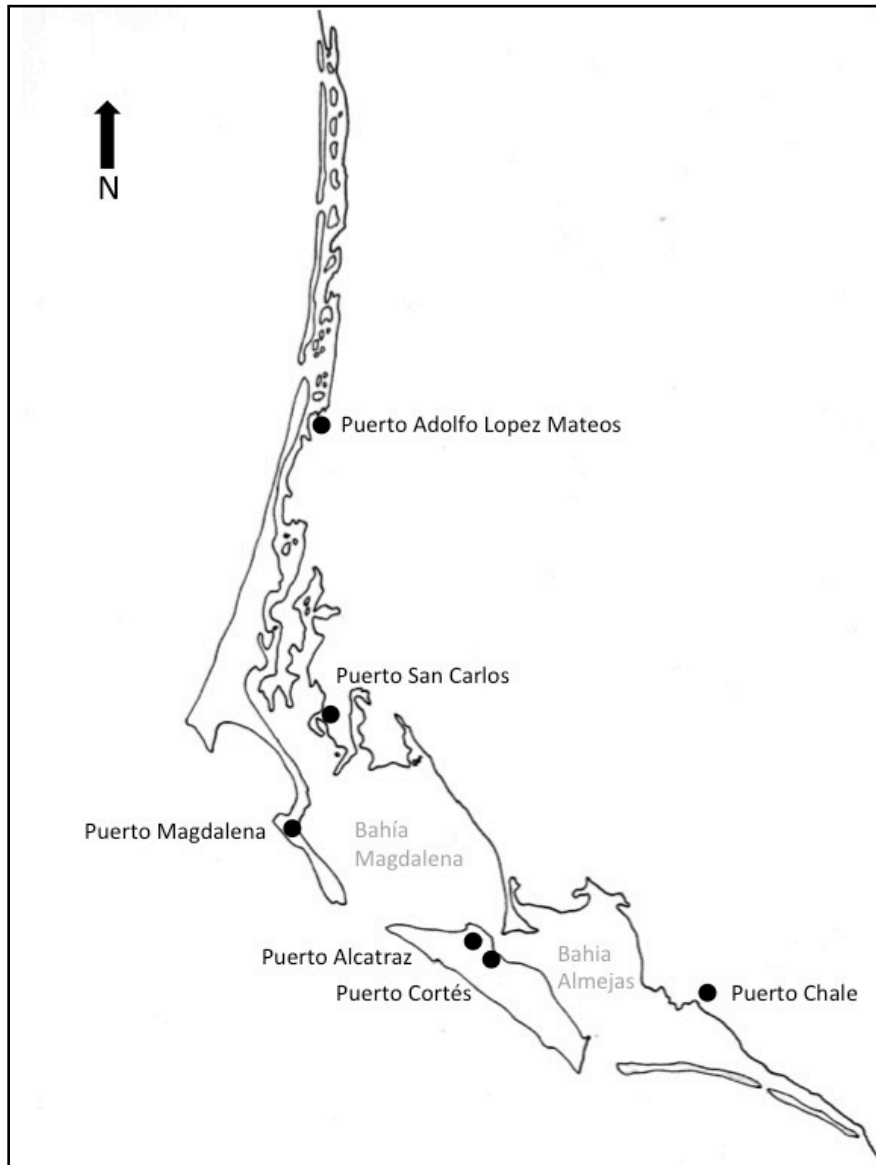
1.3. Study Area

The BMALC is located on the pacific coast of the Baja California peninsula. It is approximately 175km long and it is protected from the ocean by three barrier islands: Isla Magdalena, Isla Margarita and Isla Santa Domingo. Six permanent towns surround the BMALC: Puerto San Carlos, Puerto Adolfo Lopez Mateos, Puerto Magdalena, Puerto Cortes, Puerto Alcatraz and Puerto Chale.

Puerto San Carlos is a coastal town located on the mainland (eastern) side of the bay. It is the largest town, and in 2010 it had a population of 5,538 individuals, but this number fluctuates somewhat during the high fishing season (Gobierno del Estado de Baja California Sur 2013). While it was initially established in the 1960s as a port for exporting agricultural products from the Santo Domingo Valley (Garcia Martinez 2005), in the 1980's many agricultural workers migrated to the coastal areas to take advantage of fishing opportunities. According to a household survey in the region completed by Sawatsky (2008), artisanal fishing is currently the largest primary livelihood activity for Puerto San Carlos households (48%), followed by commerce and services (14% - aside from fishing and tourism), fish processing (12.3%) and employment in government (10%); tourism is the primary livelihood activity for only 1.8% of households.

Puerto Adolfo Lopez Mateos is also located on the mainland. It is situated north of Puerto San Carlos and close to the entrance to the Santa Domingo channel. In 2010 the population was approximately 2,212 individuals (Gobierno del Estado de Baja California Sur 2013).

Figure 1. The principle towns in the BMAC, Baja California Sur, Mexico



Created by A. Murphy, 2013.

While historically most people were employed in the local fish processing plant, changes to the management of the plant in the late 1980s meant that many locals lost their jobs and employment shifted towards small-scale fishery operations. According to the survey completed by Sawatsky (2008), as of 2006 artisanal fishing accounted for 37% of the primary livelihoods, followed by fish processing (10%), government (10%), pension (8.1%) and tourism (6.2%).

Puerto Magdalena is located on a bay facing the mainland on the southern portion of Isla Magdalena. In 2007 the population of Puerto Magdalena was approximately 259 (Instituto Nacional de Estadística y Geografía 2007); however, as indicated by Sawatsky (2008) the population is experiencing an emigration trend to nearby towns due to the lack of services and amenities on the island (e.g. schools), and a decrease in income generating fishing opportunities. In 2006 the primary livelihood for households in Puerto Magdalena was artisanal fishing (91%) followed by government (2.8%) and fish processing (2.4%) (Sawatsky 2008).

Puerto Cortes and Puerto Alcatraz are situated on Isla Santa Margarita. Puerto Alcatraz is a small fishing village and Puerto Cortes is small naval base; these towns are only accessible by boat and their combined population is estimated to be less than 500 (Flores-Skydancer 2002). Puerto Chale is also a fishing village; it is located on the coastal mainland in the southern part of the BMALC.

In addition to the more established towns, there are many small temporary fishery camps that appear along the coast during the high fishing season. On the mainland, the majority of the lands surrounding the towns are owned by ejidos. These ejido properties are communally held and have historically been used primarily for farming (alfalfa, tomato, corn, etc.) and ranching (mainly dairy cattle) (personal communication with EM & ER 2008).⁴

Although the gray whale is undoubtedly the most charismatic megafauna in the BMALC, the area also provides important breeding and development grounds for the East Pacific green turtle (*Chelonia mydas*), the Pacific loggerhead turtle (*Caretta caretta*), the Hawksbill turtle (*Dermochelys coriacea*) and the Olive ridley turtle (*Lepidochelys olivacea*) (Gardner & Nichols 2001). Furthermore, 23 species of waterbirds breed in the lagoon complex, including 12 species classified as at risk in Mexico (Zárate-Ovando et al. 2006).⁵ The BMALC has been identified as a priority area for conservation by the North American Commission for Environmental Cooperation (CEC) and Mexico's National Commission for the Knowledge and Use of Biodiversity

⁴ Initials are used in personal communication references to maintain confidentiality of interview participants.

⁵ As established by the risk categories under the Mexican Official Standard (Norma Oficial Mexicana) NOM-059-SEMARNAT-2010.

(Comisión Nacional para el Conocimiento y Uso de la Biodiversidad) and a site with species under threat of imminent extinction (Ricketts et al. 2005; Morgan et al. 2003; Comisión Nacional para el Conocimiento y Uso de la Biodiversidad 1998).

1.4. Research Objectives

The main purpose of this research project is to examine and evaluate incentive-based conservation mechanisms for the coastal ejido and private lands in the BMALC. In particular, the project attempts to address the following research questions:

- What are the key factors that foster the success of incentive-based conservation mechanisms? To what extent are the key 'success' factors present in the BMALC? Which incentive-based mechanisms are viable for conservation of the private and ejido lands in the BMLAC?
- What are the strengths and weaknesses of each of the viable conservation options? Which option, if any, is optimal for achieving conservation success?

1.5. Overview

The remainder of this project is divided into 6 chapters. Chapter 2 explores pertinent literature on conservation mechanisms, provides a summary of incentive-based mechanisms available for conservation on private lands and identifies factors for the success of these mechanisms. Chapter 3 briefly outlines the scope of the project and describes the approach and methodologies used. Chapter 4 describes the threats, response and identifies whether some of the factors for success of incentive-based conservation mechanisms are present in the BMALC. Chapter 5 evaluates an array of pertinent incentive-based options based on a comprehensive set of criteria. Chapter 6 provides a discussion on the outcomes and results from Chapters 4 and 5. And finally, Chapter 7 summarizes the main conclusions from the project.

Chapter 2.

Literature Review

2.1. Introduction

The general problem of conserving global biodiversity is complicated by several main factors.⁶ First, much of the key habitat for conserving the planet's biodiversity is located in developing countries while most of the demand for biodiversity conservation comes from industrialized countries (Albers & Ferraro 2006). Second, the people located close to these pockets of biodiversity are usually in the best position to preserve them, yet they often lack the incentives to do so (Kiss 2004). These local people are often dependent on the extraction or use of local resources for their livelihoods. Where the local resources are significant to the sustenance of local community members, the gains from resource extraction and use are typically direct, immediate and relatively short-term, while the benefits from conservation are often long-term and regionally or globally dispersed. Finally, most of the funding for biodiversity conservation both comes from and is spent in developed countries (James et al. 1999). With relatively low amounts of funding, few incentives and a high need to conserve biodiversity in developing countries, finding the most efficient and effective solutions to the problem is extremely important.

With the importance of efficacy and efficiency in mind, this chapter reviews the literature on the types of incentive-based, conservation practices as well as theories and lessons learnt in their application (with a particular focus on developing countries). The first section of this chapter will outline the path that the modern conservation movement has moved along. Understanding this path is important for recognizing which policies may be effective for future conservation projects. The next section will briefly identify

⁶ These factors are in addition to the public good issue pointed to in Chapter 1.

and define some of the common features of all direct incentive approaches. The remainder of the chapter will identify the variety of direct incentive approaches available, summarize lessons learnt from the application of these approaches, and highlight key theoretical perspectives from the literature.

2.2. The Modern Conservation Movement

Policy instruments designed to conserve biodiversity and individual species have undergone significant changes in the past century. The modern conservation movement began with the establishment of Yellowstone National Park by the US government in 1872 (Hays, 1987). However, it wasn't until the 1960's, after the publication of highly influential works such as *A Sand County Almanac* (Leopold 1948) and *Silent Spring* (Carson 1962) that the conservation movement began to gain significant momentum. Parks and protected areas quickly became a popular mechanism for promoting habitat protection and species conservation. Between 1962 and 2003 the number of protected areas in the world increased from 9,214 to 102,102, bringing the total area to 12.65% of the earth's surface by 2003 (Chape et al. 2003).

On privately owned, managed or used lands, government implemented protected areas have occasionally been a successful conservation solution. However, there are many instances of these protected areas failing to meet their conservation objectives or meeting these objectives with extreme costs to local people, particularly in developing countries (Turnbull 1972; Colchester 1997)^{7,8}. With public outcry resulting from the extreme costs, policy makers and members of the conservation community sought alternative strategies.

⁷ During the creation of Kidepo National Park in Uganda in the 1960s, the Ik people, who had been living in harmony with the environment in the Kideop Valley for thousands of years, were forced off their traditional lands within the new park boundaries (Turnbull 1972). The Ik were forced out of the fertile Kideop valley and onto the adjacent, infertile highlands where prolonged famine caused their entire population to die from hunger. This is an extreme, albeit illustrative example of what the creation of local parks can do when the needs of the local people are not taken into account.

⁸ In India's Save the Tiger program 2250 square kilometers of reserve land was set aside to conserve tiger populations. Although local people were permitted to continue residing in the reserve they were denied many of their rights (such as the rights to extract and use resources). This caused economic hardship and human death rates were greatly increased due to tiger attacks (Colchester 1997).

For conservation in developing countries, the recognition that meeting the needs of local people is an integral part of successful conservation projects, and the opportunity to draw funding from both development and conservation organizations, sparked the creation and popularity of Integrated Conservation Development Projects. Integrated Conservation Development Projects became a popular mechanism for conservation in the mid-1980's. By 1995 there were already descriptions of more than one hundred different Integrated Conservation Development Projects across the globe (Alpert 1996). These projects *"link the conservation of relatively intact natural habitats with the development of better living conditions in local human communities"* (Alpert 1996, pg 8460).

While laudable for their goals, Integrated Conservation Development Projects have unfortunately been quite unsuccessful in practice. There are many publications outlining the overall failure of Integrated Conservation Development Projects to meet both their conservation and development objectives (Barrett & Arcese 1995; Biodiversity Support Program 1996; Brandon et al. 1998; Brandon and Wells 1992; Brown 2003; Church & Brandon 1995; Gibson & Marks 1995; Larson et al. 1998; Sanjayan et al. 1997; Western & Wright 1994; Winkler 2011).


Project analysts attribute the failure of Integrated Conservation Development Projects to various factors including: failure to provide sufficient incentives for improving conservation behaviour (Gibson & Marks 1995; Winkler 2011); an incompatibility between conservation and development goals for many projects (McShane and Wells 2003; Salafsky and Wollenberg 2000); and project-generated increases in economic opportunities contributing to increases in local resource extraction rates (Brown 2003; Langholz 1999; Ferraro 2001).

Paul Ferraro, David Simpson and Agnes Kiss have contributed particularly influential work by pointing to an alternative to Integrated Conservation Development Projects and Protected Areas (Ferraro and Kiss 2002; Ferraro and Simpson 2002; Ferraro 2004; Simpson 2004). These authors argue for the use of direct incentives instead of the indirect incentives that most Integrated Conservation Development Projects use. The most direct incentive projects make payments to communities or individuals based on the level of conservation achieved. Ferraro and Simpson (2002) assert that the more direct an incentive is, the more cost efficient it will be. Furthermore,

they claim that conservation is likely to be more successful with direct incentive mechanisms because conservation is placed as the primary goal (Ferraro and Gjertsen 2009).

Ferraro and Kiss (2002) outline incentive mechanisms on a scale of least direct to most direct (Table 1). Ferraro, Kiss and Simpson’s work has been pivotal in shifting conservation efforts towards direct incentive mechanisms.

Table 1. Approaches for Creating Conservation Incentives

| | |
|--|--|
| <p><i>Least direct</i></p>  <p><i>Most direct</i></p> | <ul style="list-style-type: none"> • Support for the use/marketing of extracted biological products |
| | <ul style="list-style-type: none"> • Subsidies for reduced-impact land and resource use |
| | <ul style="list-style-type: none"> • Support for the use and or marketing of biodiversity within relatively intact ecosystems |
| | <ul style="list-style-type: none"> • Payment for other environmental services (biodiversity is generated as a side benefit) |
| | <ul style="list-style-type: none"> • Payment for conservation land or retirement of biodiversity use rights |
| | <ul style="list-style-type: none"> • Performance-based payments for biodiversity conservation |

Adapted from Ferraro and Kiss (2002, pg 298)

2.2.1. Transaction Costs and Other Considerations in Comparing Direct Incentive Mechanisms

Whether they are organized through government and legislation or NGO’s and contracts, all of the direct incentive approaches are market-based; as such, they all involve transactions between consumers and suppliers. In an ideal economic world with assumptions of perfect information and perfect competition the market would set the price where the marginal benefits to consumers equal the marginal cost for suppliers. As outlined by Coase (1988), one of the fundamental problems with this model is that it disregards transaction costs. According to Coase’s arguments, transaction costs not only diminish the efficiency of market-based projects but they make them inefficient if

these costs are higher than the costs to society that are posed by the issue the projects are trying to resolve.

Boyd et al. (2000) indicate that the main cost differences across conservation projects are the transaction costs. Transaction costs include search costs (the cost of potential exchange parties finding each other), negotiation costs and concluding costs (verifying that both parties have lived up to their end of the deal – monitoring and enforcement costs) (Coase 1988). Van Huylenbroeck et al. (2004) provide a detailed summary of how transaction costs have been assessed in environmental schemes.

It is important to note that in their comparison of the efficiency of direct payments versus less direct approaches, Ferraro and Simpson (2002) do not take transaction costs into account; they justify disregarding these costs by assuming they will be similar in all conservation initiatives. It is therefore plausible that the approaches Ferraro and Simpson have deemed less efficient (second-best) may actually be more efficient if they have notably smaller transaction costs than the first-best approaches. Southgate and Wunder (2009) point to the significance of transaction costs in relation to Payment for Environmental Services programs.

Local conditions are also a key consideration in determining appropriate policy options (Palumbo et al. 1984, Maynard-Moody et al. 1990 & Hjern 1982 all In Matland 1995). With respect to incentive-based conservation programs, Keppel et al. (2012), Ferraro (2009) and Huang et al. (2009), amongst others, highlight the importance of understanding local conditions. Hastings and Fisher (2001) provide insight into some of the local conditions in the BMLAC, and an overview of management priorities for the area; however, their analysis is prescriptive and somewhat out of date.

2.3. Direct Incentive Conservation Mechanisms

Due to the transaction cost consideration, as well as the need for decision makers to evaluate policies on criteria in addition to efficiency, it is important to consider more than just the single most direct incentive-based mechanism in any ex-ante policy evaluation. In the following sections of this chapter I will focus on literature related to the four most direct incentive approaches, as listed in Table 1. The two least direct incentive approaches will not be examined in detail here on account of their inefficiencies and demonstrated ineffectiveness; specifically, the sustainability of these approaches is a

key concern outlined by Tewari and Campbell (1996), Barrett and Arcese (1998), and Norris and Chao (2002, as cited in Ferraro and Kiss 2002).

2.3.1. Support for Marketing Biodiversity within Relatively Intact Ecosystems (Ecotourism)

This approach entails subsidising and/or investing in activities that create economic opportunities that leave the natural ecosystem relatively intact (e.g. ecotourism, collection of wild foods, sport hunting, fishing). The intention is that by promoting these types of economic opportunities, communities will have the ability to move away from ecologically harmful activities. Furthermore, since these opportunities rely on a healthy functioning natural ecosystem, there would be incentives to ensure that the natural ecosystem is conserved.

Due to the presence of several charismatic fauna within the BMLAC (most notably the gray whale), the most plausible approach for supporting the use and/or marketing of biodiversity is promoting ecotourism. Ecotourism has often been hailed as a panacea for biodiversity conservation due to its potential to create incentives for biodiversity conservation while generating local economic benefits (Bookbinder et al. 1998; Fleischer 2009; Gossling 1999; Gurung and Coursey 1994). Kiss (2004) identifies the ways in which community-based ecotourism can provide effective incentives for conservation.

The ideal is a direct linkage, in which tourism earnings are so high that people deliberately protect biodiversity to protect that income. Tourism can also draw local labor and capital away from biodiversity unfriendly activities (Wunder 2000). (Kiss 2004, pg. 234)

Many individual case studies document the successes and failures of ecotourism projects in achieving positive conservation results (Aylward et al. 1996; De Groot 1983; López-Espinosa 2002; Rowat and Engelhardt 2007; Taylor et al. 2006; Wunder 1999 & 2000; Ouba 1997). Research assimilating the results from such studies provides insight into the factors that contribute to the successes and/or failures. In an analysis of 251 case studies on ecotourism, Krüger (2005) concludes that while 64.1% were ecologically

sustainable, only 17% reported a positive effect on conservation.⁹ Krüger found that local community involvement increased the probability that an ecotourism project would have a positive effect on conservation, while a project being located in Central America, Asia, Africa or in coastal habitats significantly decreased this probability.

Salafsky et al. (2001, as cited in Kiss 2004) demonstrate that conservation is more likely to be achieved in areas that require only moderate changes in local land use economic activities to attain conservation benefits. Salafsky et al.'s work also indicates that projects are most likely to be viable when they are simple and use skills and technology already held by community members.

Coria & Calfucura (2012) in their review of ecotourism projects in indigenous communities over the past 20 years, highlight the successes and failures of these projects. With respect to successes, they conclude that for many projects, while actual benefits of the ecotourism ventures are small, they still improve the means of living for the local communities, increase the provision of local public goods, and increase land value and capital formation. With respect to failures, they indicate that the distribution of benefits of the projects indicates significant inequality between the communities and external stakeholders, there is a propensity for developing countries to cede control of ecotourism developments to foreign interests or wealthy and powerful elites, and there is often a lack of enforcement of the environmental regulations governing the projects.

In addition to providing local incentives for conservation, ecotourism projects can lead to increased conservation awareness, attitudes and philanthropic support from visiting tourists (Powell and Ham 2008). Wunder (2000) demonstrates that successful ecotourism can positively influence national policies to support conservation.

In the literature there are a wide variety of analyses and examples highlighting the pitfalls of ecotourism as a conservation mechanism. Stronza (2007), Ferraro (2001) and Barret et al. (2000) indicate that increases to local incomes as a result of ecotourism can result in increased exploitation of local resources through the acquisition of more technology and labour by local community members (this is more likely to occur when

⁹ In his study Krüger (2005) accepted projects as ecologically sustainable where "*the current practice does not pose a risk to the area or species in the foreseeable future*" (pg 582). He defines a positive contribution to conservation as "*stabilizing or increasing a threatened species' population or that new areas were being protected*" (pg 591).

ecotourism is not directly linked to conservation goals and/or there is no enforcement). Increases in population (both the transient tourist population and the general population due to the increased economic opportunities in the town) can lead to increased demand for infrastructure and housing and in turn lead to increased pressures on local ecosystems. In some cases these factors result in projects having more negative impacts than positive on the ecosystem and/or species that they were intended to protect (Issacs 2000; Stronza 2007).

Despite these potential pitfalls, it is important to recognize that ecotourism, if managed properly, may be less damaging to the local environment than alternative industries (Issacs 2000). Furthermore, although ecotourism may face the same challenge as many other Integrated Conservation Development Projects, in that there may be an incompatibility between the project's development and conservation goals, this issue can be circumvented if ecotourism is managed in a way that places conservation as the top priority (Alward et al. 1996; Krüger 2005).

2.3.2. Payments for Environmental Services

Payments for environmental services (PES) projects have been applied globally and within Latin America more frequently than many of the other direct incentive approaches. The recent interest and widespread application of PES (Pattanayak et al. 2010), and the similarity of PES to many of the other market based direct-incentive approaches makes it particularly important to evaluate these projects. PES projects involve paying land rights holders to conserve aspects of their land that function to provide natural services that are valuable to humans (e.g. water filtration and carbon sequestration functions provided by wetlands). Although biodiversity conservation is not typically the main objective of these projects, it is often an added side benefit.

PES projects have been put in place by governments and NGOs (Alix-Garcia et al. 2005; Arocena-Francisco 2003; Díaz et al. 2002; Hartmann and Petersen 2004; Mayrand and Paquin 2004; Pagiola et al. 2007; Wunder and Montserrat 2008; Zibinden 2004). Recently several authors have pointed to the lack of, and need for, credible empirical research to evaluate the success and failure of PES programs (Brouwer et al. 2011; Ferraro 2011; Pattanayak et al. 2010). Such research would help identify more definitive and crosscutting factors for success in the implementation of these programs.

However, the current literature does summarize case studies and review multiple projects that provide important insights. While not exhaustive, Table 2 and the paragraphs below provide a synthesis of some of the most important from this work.

Table 2. Results and Lessons from Past and Current Payment for Environmental Services Projects

| Author & Project | Summary of Results |
|--|---|
| Frost and Bond (2007) Zimbabwe's Communal Areas Management Program for Indigenous Resources (CAMPFIRE) | <p>Lessons (Frost and Bond 2007 pgs 10-11):</p> <ul style="list-style-type: none"> • <i>“community level commercial transactions can seldom be pursued in isolation</i> • <i>non-differentiated payments weaken incentives (also see Drechsler et al. 2007)</i> • <i>start up costs can be high and may need to be underwritten</i> • <i>competitive bidding can allow service providers to hold on to rents</i> • <i>schemes must be flexible and adaptive”</i> |
| Swallow et al. (2007) Review of PES programs | <p>Factors for Success:</p> <ul style="list-style-type: none"> • local market opportunities and a local shortage of particular environmental services (result in a demand for PES institutions and more secure property rights) • secure property rights (simplify creation of a PES scheme) • presence and support of international environmental agreements, international organizations and international networks • public attitudes towards government environmental responsibility (if public perceives governments to have weak environmental policies they will see PES schemes as an important alternative) • local trust of market mechanisms - this can stem from secure individual and group property rights • strength of the regulatory regime effecting the environment - this condition is also supported by the findings of Kroeger and Casey (2007) |
| Poats (2007) Latin American Regional Workshop on Compensation | <p>Factors for Success</p> <ul style="list-style-type: none"> • presence of a regulatory framework which supports PES • analysis of legal and institutional framework prior to negotiating a contract or examining services for payment • local support of and participation in the creation and application of the PES legal framework <p>Improving PES's contributions towards local poverty alleviation (Poats 2007, pg18):</p> <ul style="list-style-type: none"> • <i>“Keep the transaction costs low</i> • <i>Assure the desired results of compensation (the maintenance of ecosystem services)</i> • <i>Target the poorest sectors (complete social mapping) in design,</i> |

| Author & Project | Summary of Results |
|----------------------|---|
| | <p><i>implementation and monitoring phases</i></p> <ul style="list-style-type: none"> • <i>Provide assistance for poorest to participate in a positive way</i> • <i>Identify and understand the local landscape and formal property rights</i> • <i>Assure that the compensation covers, at a minimum, the opportunity costs</i> • <i>Assure that the payment is a real motivation for the desired change in land use and property rights"</i> |
| Neef & Thomas (2009) | <p>Prerequisites for PES markets that function (Neef & Thomas 2009, bullets on pg 4-9):</p> <ul style="list-style-type: none"> • <i>"Environmental services to be provided are clearly defined</i> • <i>Potential buyers of environmental services are aware of the PES concept and willing to pay</i> • <i>Providers of environmental services are able and willing to cooperate on a voluntary basis</i> • <i>Types, forms and levels of rewards are clearly defined and adapted to local contexts</i> • <i>PES mechanisms and payment schemes are transparent and based on conditionality</i> • <i>Trust between buyers and sellers of environmental services is established</i> • <i>Credible intermediaries facilitate the PES mechanism</i> • <i>Supportive legal and regulatory framework is in place</i> • <i>Well-functioning property rights are defined prior to the introduction of the PES scheme or introduced as part of the PES package"</i> |
| Wunder (2013) | <p>Conditions needed for PES to materialize and work:</p> <ul style="list-style-type: none"> • <i>benefits need to be greater than the costs of incremental provision of the service (buyers max willingness to pay must be more than the seller's lowest willingness to accept compensation)</i> • <i>the buyer and seller both need to have motivation to participate (culture of give and take);</i> • <i>there needs to be basic trust between buyers and sellers;</i> • <i>transaction costs need to be relatively low – which is usually the case when there are fewer service buyers/sellers (few individuals or few organized groups of individuals); and,</i> • <i>the property rights of the service sellers need to be clear and secure</i> |

PES schemes can vary widely in their structure and objectives. Wunder (2005, pg. 3) attempts to provide a definition for a PES. He indicates that it is a *“voluntary transaction where a well-defined environmental service (or a land-use likely to secure that service) is being ‘bought’ by an environmental service buyer from an environmental*

service provider if and only if the environmental service provider secures environmental service provision.” Southgate and Wunder (2009) indicate that PES programs, particularly in Latin America, do not often respect the five principles outlined in Wunder’s (2005) definition. They ascertain that while these programs should be customized to local conditions to be successful, they would generally be more effective if they more closely followed the principles set out in this definition, particularly conditionality and ensuring the service is well defined (Southgate & Wunder 2009). Huang et al. (2009) in their review of PES programs in Asia, indicate that success of these programs has been impeded by weakly enforced conditionality and mandatory participation.

In his critique of PES programs, Wunder (2007) concludes that PES are best suited to cases where opportunity costs of conservation are moderate and the areas to be conserved are faced with emerging, but not-yet realized threats. Ferraro (2009), Huang et al. (2009), and others further highlight the importance of taking local conditions into consideration in the design and implementation of PES schemes. Kroeger & Casey (2007), and Wunder et al. (2005) indicate that effective low-cost monitoring and valuation of techniques are necessary for the efficient allocation of PES schemes and their enforcement. Pagiola and Platais (2002) indicate that transaction costs can be prohibitively high where landowners are dispersed, but these costs can be reduced by joining landowners in bundled groups through which they can join incentive programs. Dougoulii et al. in their examination of several PES schemes in Africa, indicate that, *“Strong existing local institutions, clear land tenure, community control over land management decision-making and up-front, flexible payment schemes are found to be vital”* (Dougoulii et al. 2012, pg 1).

2.3.3. Payment for Land Conservation or Retirement of Biodiversity Use Rights

Payments for ecosystem services and conservation performance payments are relatively recent constructs. Conversely, a variety of formal mechanisms through which payments for land conservation can be made have long been in existence. These approaches involve payments to the owner of a defined right (e.g. land-owner, permit holder) in exchange for the control over that right (permanent control in the case of purchase of fee simple rights or an easement, or temporary in the case of a lease or

agreement); the purchaser is then able to ensure that the right is used in a manner that is consistent with the conservation objective. Although many of these mechanisms were not designed for the intent of conservation, they are widely used on private lands for this purpose (Swift et al. 2004). These mechanisms include establishing land conservation agreements and procuring fee-simple land rights, lease rights, easement rights and usufructuary rights (timber harvesting permits, etc. that are retired or actively used for conservation once they have been procured).

General comparisons of advantages and disadvantages of these tools are prevalent in the literature (Parkhurst and Shogren 2003; Main et al. 1999; Parker 2004; Wolman 2004). Most of this literature focuses on the application of these tools (particularly easements) in the United States, and there is little research summarizing general lessons or factors of success. One common theme in the literature is the need for strong property rights and a legal structure that supports both the use and enforcement of the instruments.

Swift et al. (2004) summarize some of the barriers to the use of these instruments in Latin America. They indicate that these tools (along with other private land conservation efforts) are hindered by the lack of a comprehensive set of legal instruments (conservation easements, private reserves), land tenure laws that discourage conservation and the lack of capacity in organizations that support private land conservation efforts. They recommend the following courses of action for effective support of private lands conservation efforts in Latin America:

- Strengthen the legal framework;
- Strengthen juridical security of conservation lands, including reform of land tenure laws and improved law enforcement;
- Establish economic incentives (i.e. tax incentives for donated easements);
- Increase institutional capacity and financial support to key institutions;
- Enhance training and education opportunities;
- Increase public-private collaboration for management and conservation.

Furthermore, the literature indicates that there is no best-fit approach for these tools; all of the tools have different benefits and costs, which need to be assessed on a case-by-case basis.

2.3.4. Performance-Based Payments for Biodiversity Conservation

Performance-based payments for conservation consist of regular remuneration of landowners for the achievement of a specific biodiversity conservation outcome (e.g. annual payments based on the number of birds nesting on a property). The literature documenting the successes and failures of performance-based conservation payment is fairly limited because many of these projects are still in their infancy. Table 3 summarizes the conclusions that authors have made based on their analyses of performance-based payment approaches. Ferraro and Gjertsen (2009) identify the desired characteristics of direct payment projects based on their early evaluation of direct payments for sea turtle conservation. Missrie and Nelson (2005) identify desired characteristics of direct payment applications, derived from their analysis of the Monarch Butterfly Conservation Fund (a scheme that pays community members for the conservation of monarch butterfly habitat in Mexico). And finally, Milne and Niesten (2009) highlight insights for future projects and conditions under which direct payments may be unsuitable; their conclusions are based on an analysis of 37 direct payment approaches in developing countries.

Table 3. Summary of Results and Conclusions from Reviews of Performance-Based Payments for Biodiversity Projects

| | |
|-----------------------------|---|
| Ferraro and Gjertsen (2009) | Projects are more likely to succeed when: <ul style="list-style-type: none"> • landowners have the ability to impose and enforce property rights; • payments are directly linked to the conservation outcome (the more direct the linkage the better the prospect for success); • the payment scheme is designed to meet the risk and time preferences of the local community (Ferraro and Gjertsen find that community members in project areas are often risk averse and have short-term time horizons). |
| Missrie and Nelson (2005) | Desired characteristics of direct payment projects (Missrie and Nelson 2005, pg. 15): <ul style="list-style-type: none"> • <i>“Clear conservation goals and objectives.</i> • <i>Clear social goals and objectives.</i> • <i>High investment in design of institutional arrangements and monitoring.</i> • <i>Institutions that enable stakeholder participation, collaboration and conflict resolution.</i> • <i>Separate organizations for fund management and disbursement, and for monitoring conservation outcomes and compliance.</i> • <i>Commitment to a long-term financial, monitoring and social involvement contract.</i> • <i>Strong field presence and communication with communities.</i> |

| | |
|--------------------------|--|
| | <ul style="list-style-type: none"> • <i>Clear, understandable and fair rules.</i> • <i>Low opportunity costs for beneficiaries to create attractive incentives.</i> • <i>Adequate political timing (political transitions may complicate implementation)."</i> |
| Milne and Niesten (2009) | <p>Insights for future projects:</p> <ul style="list-style-type: none"> • Participatory processes are required prior to and during negotiations of payment contracts. • Project success partially depends on clearly understood and defined local property rights, resource management responsibilities and resource claims (whether formal or de facto). • The legitimacy of a conservation payment project is fundamental to its success. • In order to avoid unwanted environmental or social impacts, conservation agreements should be designed to distribute costs and benefits equitably and as a minimum, conservationists should be responsible for ensuring that the agreements do not cause negative social impacts. • An ongoing funding source is a key component of successful conservation payment projects (i.e. in order for a conservation agreement to be complete an endowment must be in place to sustain it). <p>Conditions under which direct payments are unsuitable, (Milne and Niesten 2009, pg. 539):</p> <ul style="list-style-type: none"> • <i>"conflicts over property rights cannot be solved in the short-term</i> • <i>potential service providers are not clearly identifiable or are unwilling to participate</i> • <i>the nature of threats to biodiversity means that cheaper or more effective solutions are possible</i> • <i>service providers may incur significant risks or unacceptable social impacts"</i> |

2.4. Summary

Lessons from historical conservation approaches highlight the importance of incentive-based mechanisms, particularly for conservation of private properties. The more-direct approaches available include the following: support for marketing biodiversity within relatively intact ecosystems; payments for environmental services; payments for defined legal rights (e.g. fee-simple land purchase, easements, leases, permits or usufruct rights purchase); payments for land conservation; and performance-based payments for biodiversity conservation.

Authors have argued that the most direct incentive approaches are the most efficient (Ferraro and Simpson 2002); however, direct incentive approaches are not a panacea (Barrett et al. 2013), and other considerations need to be taken into account in order to identify the optimal conservation mechanism for any particular situation.

Transaction costs are an important additional consideration in the efficiency and effectiveness of a policy. Other key elements for conservation success, as identified by the literature, include: legitimacy, flexibility, monitoring costs, monitoring effectiveness, directness of incentives, equity, and persistence of funds and the policy. Furthermore, the literature also clearly shows that local conditions, particularly the property rights and regulatory regime greatly affect the feasibility of incentive-based conservation mechanisms in any particular location.

Chapter 3.

Approach and Methods

3.1. Introduction

As indicated in Chapter 1, this project focuses on incentive-based conservation mechanisms for private and ejido lands in non-urban areas around the BMALC.¹⁰ There are impending development threats to these lands (Chapter 4). These threats have the potential to have a significant impact on the quality of habitat for gray whales and numerous other species in the BMALC. Land use activities within the coastal urban areas also have the potential to threaten gray whale conservation. However, due to the distinct characteristics of the urban areas (significantly larger number of resource users and landowners), the types and application of incentive-based mechanisms appropriate for conservation are likely to be significantly different than for non-urban areas. Furthermore, since the urban areas are more densely populated and developed than the surrounding ejido and private lands, it can be assumed that the costs of implementing incentive-based mechanisms would be much higher (largely as a result of high transaction and opportunity costs). For these reasons and to maintain a suitable scope, this project focuses solely on the non-urban private and ejido lands around the BMALC.

3.2. Methods

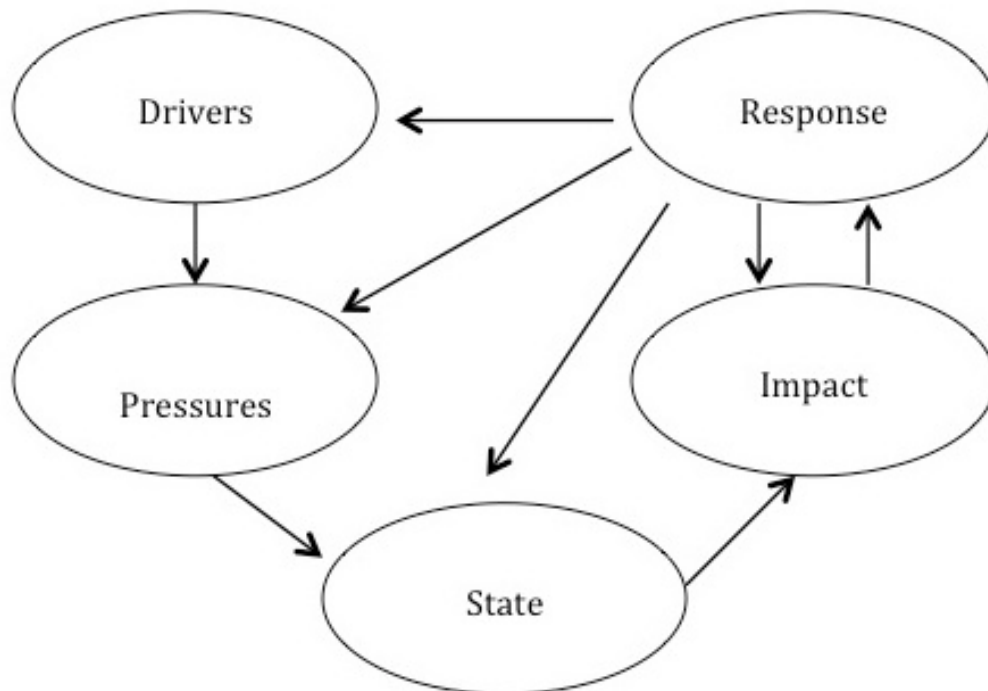
3.2.1. Institutional and Threat Assessment

Incentive-based conservation mechanisms are likely to be important for achieving conservation within the BMALC. Understanding the local conditions that

¹⁰ For clarity, the term private land is used to denote privately owned lands outside of the urban centres in the BMLAC.

influence conservation related to the private and ejido lands in the BMALC and the regulations and policies that are currently in place to control those impacts should help to reveal which incentive-based conservation mechanisms would be most suitable in the local context. The Driving force-Pressure-State-Impact-Response (DPSIR) framework (Spangenberg et al. 2009) is used to demonstrate whether some of the key factors for success for incentive-based conservation mechanisms, as outlined in Chapter 2, are present in the study area. The information collected to complete this framework is then used to determine whether incentive-based approaches could be appropriate for the case of conservation of the private and ejido lands around the BMALC and which options should be brought forward into a more detailed multi-criteria analysis. Additionally, completion of the DPSIR is useful because it provides insights into and helps organize information about the complex policy context in the BMALC; this is important for grounding and informing the detailed policy evaluation in the subsequent chapter.

Figure 2. DPSIR Framework



(Smeets and Weterings 1999 as cited in Maxim et al. 2009)

The DPSIR framework was initially developed to provide a consistent terminology and a coordinated methodology for looking at environmental problems through the large array of intersecting disciplines and research issues involved (Spangenberg et al. 2009). It has been applied extensively to aid policy makers and academics in developing clearer understandings of complex environmental problems (Kristensen 2004; Karageorgis et al. 2005; Bidone & Lacerda 2004; Skoulikidis 2009). In addition, this framework has been previously applied to the BMALC situation “*to provide an approach toward balancing community development with ecological integrity in the peripheral and central zones of Magdalena Bay*” (Hastings and Fischer 2001, pg 194). Hastings and Fischer focus broadly on resource management in the BMALC and the response section of their analysis is prescriptive rather than descriptive. Here, I focus on the DPSIR as it pertains specifically to impacts to biodiversity caused or potentially caused by ejido and private land-use activities around the BMALC.

Property rights underpin the regulatory regime and, as highlighted in the literature review, well-defined property rights are a key factor for success of incentive-based conservation mechanisms. Understanding the basic organization of property rights in the BMALC helps scope and ground the DPSIR. A property rights assessment is provided in Appendix 1 and used to inform portions of the DPSIR assessment.

While the simplicity of the DPSIR framework makes it practical for communicating the key issues (Delbare 2002; European Environment Agency 2007), it is recognized that its ability to capture all of the complexities is limited (Maxim et al. 2009). Given the abundance, and complex interdependency of the social, economic, environmental and political factors related to conservation of ejido and private lands in the BMLAC, the application of this straightforward framework is valuable for describing and assessing the salient parts of the problem. The framework focuses on threats (pressures) relating to private and ejido land-use activities, but as is apparent in Chapter 4, many of the driving forces for these threats come from factors external to the private and ejido lands.

The main methods used to collect the information necessary for completing the DPSIR framework are described in section 3.3; they include a review of pertinent legislation, a literature review and key informant interviews.

3.2.2. Multi-criteria Analysis

A multi-criteria policy analysis is used to assess which of the practicable options (identified in the DPSIR analysis) would be optimal for achieving successful conservation in the BMALC. For this policy evaluation it is assumed that an Environmental Non-government Organization (ENGO) is the decision maker; policies are therefore evaluated from the ENGO's perspective. While the policies could conceivably be applied by government, it has been suggested that the cost effectiveness of having government coordinate incentive-based mechanisms would be undermined by side objectives such as poverty alleviation, regional development, etc. (Wunder et al. 2008 as cited in Pattanayak et al. 2010). As such, a third party organization with a clear conservation mandate and objectives was determined to be the most appropriate decision maker. It is clear however that the support of government would be crucial for the success of the different approaches, which is why legitimacy is included as one of the evaluative criteria in the analysis. In order to simplify the evaluation, it is assumed that only one policy will be implemented (i.e. combinations of policies are not considered). While Doremus (2003) has highlighted the advantages to a multi-policy approach, a single policy approach is advantageous here because it enables clearer identification and communication of advantages and disadvantages of each of the policies.

The evaluation criteria were selected through an iterative process. Criteria identified in Mickwitz's (2003) paper entitled, "A Framework for Evaluating Environmental Policy Instruments: Context and Key Concepts" were used as a starting base. These criteria were then refined based on criteria identified in other pertinent journal articles related to environmental policy evaluation (Doremus 2003; Naidoo 2006), interviews with key informants (see section 3.3) as well the key factors for conservation success identified in the literature review. The final criteria selected for use in the evaluation are outlined in Table (4).

Table 4. Evaluation Criteria for the Multi-Criteria Analysis

| Evaluation Criterion | Definition for the purposes of the evaluation |
|---|--|
| Legality | The extent to which the mechanism is enabled and/or supported by the local, state and federal laws. |
| Level of Conservation (Conservation Benefits) | The amount of land and quality of conservation that the policy will provide in any one contracting period. |
| Persistence | The length of time that the policy is likely to be effective (depends on the nature of the mechanism as well as the ability to monitor and enforce the terms of the mechanism). |
| Flexibility | The ability of a conservation mechanism to adapt, through changes in the land management regime and changes in the particular parcels of land it protects, in order to deal effectively with changing conditions. |
| Impact on Peripheral and Future Conservation Incentives | The extent to which the policy could elicit unintended impacts on conservation. I.e. the impact that the policy is likely to have on the local stakeholders' perception of their conservation responsibilities (duty of care). |
| Transparency | How easily stakeholders can understand the policy and recognize its impact on conservation, how easily the conservation outcomes of the policy instrument can be measured and communicated and how clear are the roles and accountability of the players involved in implementing the policy instrument (adapted from Finkelstein 2003). ¹¹ |

¹¹ Other factors such as public access to financial and scientific data are also often used to evaluate transparency, but are generally only used in ex post evaluations, since ex ante many of the details that contribute to these factors are still undetermined.

| Evaluation Criterion | Definition for the purposes of the evaluation |
|----------------------|--|
| Costs to the ENGO | <p>Naidoo et al. (2006) identify five types of costs associated with conservation projects, three of which are applicable and used for this project's policy analysis.¹² They are as follows:</p> <ul style="list-style-type: none"> • Acquisition costs, which are the costs of obtaining the partial (e.g. easement, lease, conservation agreement) or full (e.g. fee-simple purchase) property rights to the land; these costs can be one time or periodic. • Transaction costs, which are the costs of negotiating the exchange of property above and beyond the acquisition costs (e.g. search costs, negotiation costs, taxes). • Management costs, which include the fixed and variable costs of administering the land (includes monitoring and enforcement costs). |
| Equity | The evenness of the distribution of costs and benefits and associated utilities amongst the key stakeholders. |
| Legitimacy | <p>There are varying definitions from different disciplines and authors (Stillman, 1974; Friedrich, 1963; Schaar, 1970; Abercrombie et al., 1984; Sills, 1968; Wellman, 1996). In his chapter entitled <i>How to Deal with Legitimacy in Nature Conservation Policy</i>, van Tatenhove (2008) states, "Political choices are legitimate if they reflect the 'will of the people' – that is, if they can be derived from the authentic preferences of the members of a community". Figueira (2007) identified 6 factors by which legitimacy can be measured:</p> <ul style="list-style-type: none"> • public opinion, • accountability, • normative justifiability, • legal legitimacy, • technocratic legitimacy, and • collective identity. <p>Of these factors, 3 are covered elsewhere in this evaluation (legal legitimacy, accountability, and technocratic legitimacy) and 1 pertains specifically to government actions (collective identity). Normative justifiability would be an issue for an ENGO (e.g. purchasing ejido land could go against an ENGO's principles). However, this</p> |

¹² The fourth type of cost identified by Naidoo et al. (2006) is opportunity costs. The cost criterion in this analysis is being examined from the perspective of the ENGO; the opportunity costs to the ENGO would be the same as the acquisition costs. The opportunity costs to the other stakeholders, including the landowner, are examined under the equity criterion. The fifth type of cost is damage costs. These are costs associated with damage to economic activities as a result of conservation programs (e.g. damage to livestock from an increased number of predators). There are not likely to be significant damage costs from conservation activities in the BMALC.

| Evaluation Criterion | Definition for the purposes of the evaluation |
|----------------------|--|
| | <p>factor is not analyzed here since normative justifiability would be somewhat distinct for different ENGOs. Public opinion stands out as the remaining factor that needs be taken into account in this evaluation.</p> <p>In this evaluation, legitimacy is defined as both the degree to which affected stakeholders are likely to accept the policy instrument and the degree to which the policy instrument is appropriate to the values of society (adapted from Mickwitz 2003).</p> |

In the evaluation each of the five mechanisms is rated under each of the nine criteria using a variation of the Borda method (de Borda 1784 as cited in Bouyssou et al. 2006). Each policy may receive a minimum rating of one star and a maximum rating of three stars under any one criterion. Policies are then ranked based on the number of stars they receive. Although more complex multi-criteria evaluation models (Electre I; Electre III; ACCORD), and other models such as the analytical hierarchy process (AHP) were considered for this evaluation, due to the rationale outlined below it was ultimately determined that a straightforward rating system was preferable.

Prior to determining the approach for the evaluation a crude analysis was performed (i.e. preliminary evaluation of each policy against each criterion). In this evaluation it was determined that data constraints and relatively high levels of uncertainty made a more complex evaluation method unwarranted. As Weiss (1982, pp. 620-621) indicates,

Rarely does research supply an "answer" that policy actors employ to solve a policy problem. Rather, research provides a background of data, empirical generalizations, and ideas that affect the way that policy makers think about problems. It influences their conceptualization of the issues with which they deal; affects those facets of the issue they consider inevitable and unchangeable and those they perceive as amenable to policy action; widens the range of options that they consider; and challenges some taken-for-granted assumptions about appropriate goals and appropriate activities.

Ultimately, policy implementers are responsible for determining which policy is best for a given scenario. As such, the purpose of this analysis is not to provide a definitive answer to a complex problem. It is recognized that there are limits to the information captured in this study and a prescriptive approach is somewhat inappropriate. Rather, the purpose of this policy analysis is explanatory - to highlight the

differences, benefits and drawbacks of the different approaches. By using an evaluation method that is simple, the analysis remains transparent, comprehensible and relatively easy to communicate to relevant stakeholders (ENGOS, local communities in the BMALC, etc.). Furthermore, the evaluation criteria have not been assigned weights in the analysis. While it is recognized that not all of the criteria are of equal importance, it was determined that weights are more appropriately allocated by the ultimate decision maker (ENGO).

3.3. Data Collection

Three research methods were used to gather the necessary information to complete the DPSIR framework (including the property rights evaluation) and the multi-criteria analysis.

3.3.1. Legal Review

Federal (Mexico), state (Baja California Sur) and municipal (Comondú) laws were examined to assess the current legal framework governing the environment in the BMALC and to inform the extent to which the policies met several of the criteria in the policy evaluation (legality, permanency, costs). Information collected during the literature review and the semi-structured interviews was used to help focus and guide this search.

3.3.2. Literature Review

Key word combinations were searched for in relevant databases during the literature review. The key work combinations included: conservation easements; conservation leases; direct payments for conservation; payments for conservation; incentive-based conservation mechanisms; market-based conservation mechanisms; incentive conservation wildlife; migratory species conservation mechanisms; Bahia Magdalena development (Spanish and English); Bahia Magdalena conservation (Spanish and English); Bahia Magdalena wildlife. The following journal databases were used during the search: Heinonline; JSTOR; Web of Science; Environment Complete; Science Direct; Econlit; SFU library Fast Search; Google scholar.

In addition, reference lists of key pertinent articles were scanned for additional relevant articles. Finally, sources identified during the key informant interviews and from other researchers that have been involved in projects in the study area were reviewed.

3.3.3. Semi-structured Interviews

Semi-structured interviews were undertaken with key informants including local ENGOs, members of local ejidos, and government officials at the national, state, regional and local level. Questions were set out prior to the commencement of each interview and additional lines of questioning were explored during the interview where pertinent information arose that wasn't covered in the predetermined questions.

Three research methods were used to collect information during, and immediately following interviews. Several interviews were recorded and then transcribed with the aid of a translator; this was necessary due to the accents of interviewees from very rural areas, which were difficult to understand. Extensive notes were taken during and subsequent to the interviews.

Interview notes and transcripts were reviewed in the development of the DPSIR, property rights analysis, and multi-criteria analysis. Relevant responses were highlighted and used to develop sections of these analyses.

In total 22 interviews were conducted. Three interviews were with government departments and ENGOs at the national level. Eight interviews were with government officials, ENGOs, academics and Industry leaders at the regional (Baja California Sur) level. Eleven interviews were conducted with local ENGO, government and community leaders (or groups of leaders) at the local (BMALC) level.

Chapter 4.

Results 1: Institutional and Threat Assessment

4.1. Introduction

This chapter uses the Driving force-Pressure-State-Impact-Response (DPSIR) framework to describe the local conditions around the BMALC, including the main threats to gray whale conservation in relation to current and imminent land-use practices on private and ejido lands. Pulling together the components of the framework allows policy gaps to be highlighted, establishes the rationale for incentive-based conservation mechanisms for the private and ejido lands around the BMALC, and helps determine which incentive-based mechanisms are appropriate for the local situation.

4.2. DPSIR Framework

4.2.1. Driving Forces

Driving forces are triggers that are caused by changes in social, economic and institutional systems and that have a direct or indirect impact on biodiversity (MEA 2003). Driving forces are underpinned by ongoing and changing societal needs (Kristensen 2004). The societal needs related to the private and ejido lands are heavily influenced by the circumstances in the surrounding communities; as such, driving forces from these areas are also considered.

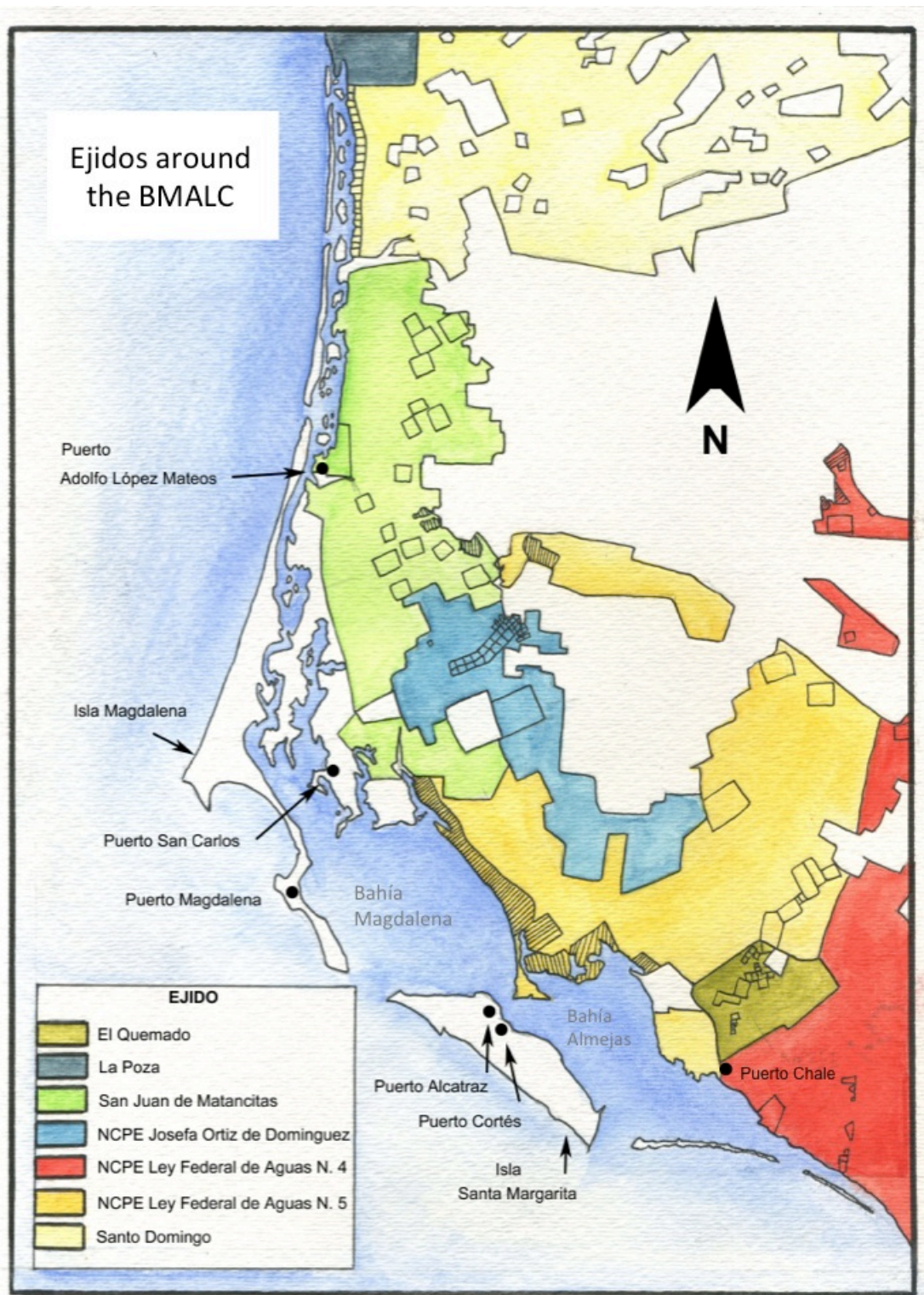
Understanding the property rights is an important precursor to discussing the driving forces, as well as other aspects of the DPSIR framework, because these rights heavily affect who has influence and control over the local resource use. A property rights assessment is included in Appendix 1, but the key aspects of this assessment are outlined herein.

There are five main categories of property rights in the BMALC: private property, ejido land, municipal land (defined here as land owned by the municipality as well as land falling within municipal boundaries that is privately owned by individuals), federal land and concessions. As shown in figure 3, there are seven different ejidos located around the BMLAC. Historically, these ejidos and the federal government held the ownership rights to the majority of the lands around the BMLAC. Changes in laws governing property rights on ejido lands have allowed these lands to be parcelized and converted into private lands (see Appendix 1 for further detail). Ejido NCPE Ley Federal de Agua No. 5 has already parcelized much of its coastal land and as of 2008 approximately 1/3 of this parcelized land had already been sold to private individuals and groups. As of 2008 the other ejidos around the BMALC still held the majority of their land as commons, and had not yet sold any significant portions.

The federal government owns the islands in the BMLAC, the intertidal lands and the coastal lands from the mean high tide mark to twenty metres inland. The intertidal and coastal lands are legislated for common use and the public may use these areas without restrictions, other than those established by Mexico's administrative laws and regulations. An authorized concession is required for special uses (e.g. fisheries) of these properties. In the BMLAC complex, there are many fishery concessions held by cooperatives, ejidos and other groups. The largest concessions are Puerto Magdalena, Puerto Chale and Puerto Cortez, which are all located on islands in the BMALC. While the concessions are technically impermanent, in interviews with fishery concession holders, it was found that the fishers holding concessions for extended periods of time felt that they had significant de facto rights and title to the land associated with their concession (personal communication with MAV 2008).

The other two towns in the BMALC are Puerto San Carlos and Puerto Adolfo Lopez Mateos. As of 2006, the primary source of income in both of these towns was small-scale fishing; however, fish processing, other commerce and services, government employment, construction and transportation, tourism and industrial fishing also provide important sources of income (listed in order of importance) (Sawatsky 2008).

Figure 3. Ejidos around the BMALC



(Adapted from International Community Foundation 2006)

The changes to laws governing property rights for ejido lands, and the local and regional desires for a stronger economy in the BMALC form some of the strongest driving forces on the ejido and private land. Local Ejidos members are looking for gainful employment, which ranching and fishing are not currently providing (personal communication with ER & EM 2008). Agriculture is difficult because water resources are scarce (personal communication with ER & EM 2008; International Community Foundation 2006). The relatively recent change in the ability of the ejidos to privatize and sell their lands or use rights has opened up opportunities for national and foreign investors to purchase coastal properties in the BMALC. The ejidos have been and are being presented with large offers for their coastal properties by tourism developers and aquaculture companies (personal communication with ER & EM 2008). Some ejidos have already elected to sell portions of their land (International Community Foundation 2006). Real estate websites focused on targeting foreigners are listing coastal properties in the BMALC for sale, including several large tracts of ejido land that have been converted to private land.^{13,14,15} Foreign investors are purchasing land in the BMALC and proposing large-scale tourist developments (personal communication with ER & EM 2008; International Community Foundation 2006).

In the BMLAC local community members and local and regional governments are concerned about current and future employment opportunities (personal communication with EM, PSC, MAV, PM 2008; Sawatsky 2008; International Community Foundation 2006). Overall, the Pacific Central Valley of Santo Domingo Region (comprised of Puerto San Carlos, Puerto Adolfo Lopez Mateos, Puerto Magdalena, Puerto Alcatraz, Ramaditas y Villa Hidalgo) has an employment rate that is much lower than the tourism focused regions such as Los Cabos. According to a recent study completed by Sawatsky (2008), the average income of residents in Puerto San Carlos and Puerto Magdalena is well below the national average for Mexico (World Bank 2009; Instituto

¹³ <http://venta-terrenos.vivanuncios.com.mx/venta-lotes+comondu/terreno-con-playa--puerto-cancun-frente-a-isla-sta-margarita/83373316> ; Retrieved November 2013.

¹⁴ <http://www.landsendrealty.com/Listings/OtherBaja/MagdalenaBayBeachfront/MagdalenaBayBeachfront.html> ; Retrieved January 2010.

¹⁵ <http://www.landsendrealty.com/Listings/OtherBaja/BahiaMagdalena/BahiaMagdalena.html> ; Retrieved January 2010.

Nacional de Estadística y Geografía 2006).¹⁶ There is a strong perception in the local communities that fishery stocks are being over harvested, and that this has and will continue to lead to a shortage of job opportunities in this industry in future years (Sawatsky 2008; Young 2001). Additionally, although the municipality of Comondú (of which the BMALC is a part) contains 75% of the harvested agricultural lands in Baja California Sur, mainly low-value crops are cultivated in this area. The municipality of Comondú (receives by far the lowest value of production per hectare in Baja California Sur (20 million pesos/ha versus Mulegé, which is the highest at 215 million pesos/ha) (Gobierno de Baja California Sur 2005).

Given concerns regarding opportunities for economic development based on traditional industries, the local people are looking towards tourism as their preference for future economic growth (personal communication with MD, JRV, PM 2008; Sawatsky 2008); this trend is seen throughout Baja California Sur, where there has been a 20% average tourism growth rate since 1988 (International Community Foundation 2006). As of 2007 approximately 2% of households in Puerto San Carlos, 6% of households in Puerto Adolfo Lopez Mateos and 0% of households in Puerto Magdalena relied on whale watching as their main income source (Sawatsky 2008). As Tovar-Vázquez (1997) indicates, on the basis of income earned by an individual worker per day, this is by far the most lucrative industry in Puerto San Carlos (this finding is also supported by Schwoerer 2007). Revenue from whale watching operations (2,917,554 pesos/yr in Puerto San Carlos and 3,604,509 pesos/yr in Puerto Adolfo Lopez Mateos (Schwoerer 2007)) is high compared to approximations of the value of agricultural production in the entire region of Comondú (Gobierno de Baja California Sur 2005). In addition, the local communities have seen the positive impact that tourism-focused development has had on job creation and infrastructure improvements in other areas of Baja California Sur (Los Cabos in particular), and they want the tourism sector to grow in the BMALC to enable similar economic growth in the area. Some community members support the idea of large-scale tourist developments, while others recognize the negative

¹⁶ The average 2007 income of residents was 71,045 pesos/year in Puerto San Carlos, 59,321 pesos/year in Puerto Adolfo Lopez Mateos and 65,179 pesos/year in Puerto Magdalena (Sawatsky 2008). Using the 2013 exchange rate (OANDA 2013), these incomes in US dollars are \$5,597 for Puerto San Carlos, \$4,484 for Puerto Adolfo Lopez Mateos and \$4,927 for Puerto Magdalena.

environmental and social impacts that such development could have, and would instead prefer to see smaller scale ecotourism development (personal communication with PM, AEA, EDC, JU 2008; Sawatsky 2008).

In addition, there is a general trend towards promoting “ecotourism” and “sustainable tourism” in Baja California Sur at national, state and regional levels (personal communication with LG, BWG, EBC, PU 2008). Due to the high primary productivity of the BMALC (Zárate-Ovando et al. 2006), expansive beaches, picturesque setting, extensive opportunities for wildlife watching (birds, turtles, dolphins, gray whale) and other recreational activities (kayaking, sport fishing, surfing), the BMALC has been deemed an ideal place to promote ecotourism (personal communication with BWG, LG, AEA 2008; International Community Foundation 2006). The Mexican president announced plans to develop a large cruise port (Puerto Cortés on Santa Magdalena Island) within the BMALC that would provide services to 200 cruise ships annually (Presidencia de la República de Mexico 2008).¹⁷ The state government’s support for large-scale tourism development in the area is exemplified by API-BCS’s (the state port authority, of which the state governor sits on the board of directors) development of land use plans for the lands surrounding the BMALC.¹⁸ The draft version of these plans aimed to protect the islands of the BMALC (limited development except for the cruise port) and focus development of tourist infrastructure (hotels, resorts, golf courses, etc) on the coastal (ejido and privately owned) areas of the mainland (personal communication with BWG, EBC 2008; “Excluye decreto a Bahía Magdalena”, 2009).

Overall, there are significant economic, political and social factors driving tourism development in the BMALC. The changes to the property rights laws in the ejidos have provided an opportunity for large tracts of coastal land that has traditionally been used for ranching and agriculture to be converted into private lands and developed for tourism.

¹⁷ In May 2013 Carnival Corp announced that it is exploring the possibility of developing a terminal in Puerto Cortes – see: <http://www.utsandiego.com/news/2013/may/09/tp-carnival-explores-adding-baja-destination/> ; Retrieved November 2013.

¹⁸ At the time of the interview (April 2008) the plans were in draft and were to be presented to the BMALC communities for review during the following autumn.

4.2.2. Pressures

As defined by Maxim et al. (2009), pressures are “consequences of human activities (i.e. release of chemicals, physical and biological agents, extraction and use of resources, patterns of land use, creation of invasion corridors) which have the potential to cause or contribute to adverse effects (Impacts)”. Pressures related to current and prospective private and ejidos land-uses, which result from the aforementioned driving forces, are outlined below using Salafsky et al.’s (2008) standard lexicon of biodiversity threats. These pressures are described in general terms, as they were not identified and quantified in depth as part of this project.

While the focus here is on pressures on the ejido and private lands, it is important to understand that activities on other lands are also currently exerting pressures on the ecosystem in the BMLAC. In particular, there is a power plant situated just north of Puerto San Carlos. Tankers transport fuel to the port in San Carlos where it is transferred to the power plant via pipeline. The plant also has a desalinization system. Furthermore, there is a fish processing plant in Puerto San Carlos, as well as a regional shipping port. It is recognized that the pressures and risks associated with these activities, while outside the scope of this project, are potentially significant (e.g. large fuel spill impacting the marine environment).

In the municipality of Comondú in general the dominant land use is livestock grazing (74%), followed by protected areas (17.5%), forestry (5.02%), agriculture (3.14%), urban (0.12%) and industrial development (0.004%) (Secretaría de Gobernación de Mexico 2010). On the ejido and private land surrounding the BMALC, livestock grazing is by far the dominant land use, although mangrove forests are prevalent along the coast, and there is some housing, one windfarm and a few parcels of protected lands (LSICA 2006). Agricultural activities for the relevant ejidos are largely located much closer inland, near the city of Comondú. Other activities related to the private and ejido lands include aquaculture, fishing, wood harvesting (mangroves) and hunting (turtle eggs).¹⁹ Pressures stemming from these activities include habitat

¹⁹ A lease was negotiated on ejido land for a wind farm and the 10 turbine project was approved in 2010. Harvesting wood from mangroves and collecting turtle eggs are illegal activities, but there is evidence these activities are routinely taking place (International Community Foundation 2006).

destruction and deterioration, soil and water pollution (Páez-Osuna et al. 1998), noise and light pollution, use of scarce freshwater resources (particularly for livestock), soil erosion (agriculture), introduction of foreign genetic material, impacts to birds from electrical wires and wind turbines and impacts to fauna from road collisions; negative impact on population recruitment for harvested flora and fauna (and species caught as by-catch in the case of fishing).

Prospective tourism development would result in residential and commercial developments (tourist resorts, vacation homes, golf courses, auxiliary buildings) and additional transportation and service corridors (roads, utility service lines, airports). The current activities would also continue, except in the areas developed for tourism (likely to be the more scenic coastal areas). Coastal tourism developments would result in much more intense destruction and degradation of habitat (particularly coastal habitat, both from the developments themselves and from recreational activities); increased noise, air, soil pollution; increased risk of introduction and spreading of invasive species; increased use of the scarce local freshwater resources; increased impacts to birds from electrical wires and to fauna generally from road collisions.

4.2.3. State

The state, as defined by Maxim (2009) is the abiotic condition of soil, air and water, as well as the biotic condition at the ecosystem/habitat, species/community and genetic levels. The magnitude of the effect of tourism development on ejido and private lands on the abiotic and biotic conditions in the BMLAC would depend largely on the scale and design of the developments; however, it is reasonable to surmise that the effects would, in large part, be negative.

With respect to the gray whale, the main concern is that disturbance from development would cause this species to abandon its use of the BMALC as a breeding area (Findley and Vidal 2002; Reeves 1997). Heckel et al. (2001) and Alter et al. (2009) provide evidence to suggest that the whales may abandon the bay when there is excessive activity, noise pollution, etc. Offshore breeding is associated with higher predation rates by killer whales and rougher ocean conditions, which would have a negative impact on calf survival rates and thus population recruitment (Pérez-Corts et al. 2000). In addition, Beineke (2009) provides evidence regarding the negative effect that

anthropogenic marine contaminants have on the immune system of whales and dolphins. This is particularly pertinent since there is evidence that gray whales are feeding during their winters in the BMALC (Caraveo-Patiño and Soto 2005).

While the gray whale is the focal species of this project, it is useful to look at the potential state from a somewhat broader perspective. This is because many of the conditions needed by the gray whale for the habitat in the bay to be functional are not yet well understood and because of the value and importance of the broader ecosystem functions in the bay. The nutrients and particulate matter carried into the bay by oceanic fronts, coastal upwellings, mangrove forest and eel-grass beds enable the BMALC's high primary productivity (Zárate-Ovando et al. 2006; Malakoff 2004; Zaytsev et al. 2003;). While tourism developments on the ejido and private lands are unlikely to affect the oceanic fronts or coastal upwellings, they would likely adversely impact the mangroves and eel grass beds.

The mangrove forests throughout the BMLAC provide particularly important habitat functions for a large variety of invertebrates, fishes and birds and these forests are particularly vulnerable to impacts from coastal development (Bizzarro 2008; Zárate-Ovando et al. 2006). The BMALC is home to one of the three most extensive mangrove ecosystems in Baja California Sur. According to Zárate-Ovando et al. (2006) mangroves cover approximately 80% of the coastline in the Santo Domingo Channel, 29% in Magdalena Bay and 60% in Almejas Bay. The mangrove habitats are extremely productive and are home to many single celled organisms and important cyanobacteria that form the basis of the area's complex food webs and rich biodiversity (Lopez Cortez 1991; Yáñez-Aranchibia et al. 1993). Whitmore (2005) has indicated that depletion of mangroves in the BMALC is already occurring due to activities associated with fisheries, tourism and coastal development. Coastal tourism development would result in further loss of mangroves, which would result in depleted habitat functions, depleted nutrients, and loss of protection of coastal areas from storms and erosion (Aksornkoae et al. 2004; Twilley et al. 1990; Whitmore et al. 2005). Halpern et al. (2007) have also highlighted the vulnerability of seagrass and beach ecosystems to impacts from coastal development.

Overall, the BMLAC provides habitat for a variety of small terrestrial mammals, over 150 bird species (including 24 species of shorebirds, and 23 species of waterbirds that breed in the area), five sea turtle species (including four known to breed in the bay),

marine invertebrates, fish (including sharks, rays, yellowfin tuna, skipjack tuna, sardines, mackerel, flounder, halibut, sea bass, grouper etc.) and marine mammals (most notably the gray whale) (Ricketts et al. 2005; Whitmore et al. 2005).²⁰ Negative impacts on species recruitment associated with coastal development include those from: fishing and poaching, electrical lines (Bevanger 1998), vegetation clearing, habitat removal and fragmentation (Wilcove et al. 1998; Crooks and Sanjayan 2006), pollution (Islam and Tanaka 2004), and invasive species (Hansen and Clewenger 2005; Hobbs and Huenneke 1992).

Finally, while not closely linked to the BMALC's gray whale habitat functions, the effects of tourism development on the condition of freshwater resources are also important. The municipality of Comondú is already facing freshwater shortages due the strain agricultural activities and urban centres are putting on the already depleted aquifers and surface water resources. According to the International Community Foundation (2006), water needs already exceed water supply in the municipality of Comondú by 20% or more. Tourism developments are notorious for their intense water use and failure of developers to adequately address this issue has been the principle reason that environmental impact assessments on several proposed development projects have been rejected in the BMLAC (personal communication with JU, LG 2008).

4.2.4. Impact

Impacts relate to changes in the state that adversely affect social, economic and environmental dimensions of the local area (Maxim et al. 2009). In the case of the BMLAC, diminished ecosystem and/or environmental functions are already resulting in decreases in catch and employment for fisheries (Young 2001) and fresh water shortages and/or salinization (Cardona et al. 2004). From a socioeconomic perspective, tourism development would likely have both positive and negative impacts. It would create jobs in the tourism industry, but where there adverse ecological impacts to fish and whales it would decrease the number of jobs in fisheries and whale watching (particularly if whales abandon the bay). Furthermore, adverse changes to the state of the ecosystem would result in diminished ecotourism values (from decreased

²⁰ <http://www.whsrn.org/site-profile/bahia-magdalena> ; Retrieved November 2013.

biodiversity); this impact could be significant considering that the BMALC's tourist potential is directly related to its high ecological values (i.e. these values are the region's competitive advantages) (International Community Foundation 2006). In an extreme case tourism development could result in relocation of residents into squatter settlements with subsequent overcrowding, infrastructure, and sewage disposal problems, as well as the leakage of profits from international hotel chains out of Mexico; this has happened in other areas of Baja California Sur (Simon 1997). Human health in the area would be impacted by increased pollution and decreased freshwater supply.

4.2.5. Response

Responses are the policy actions taken to address driving forces, pressures, state and impacts. The driving forces listed above are current, but the pressures, states and impacts associated with them have not yet been realized (i.e. while there are strong drivers for large scale tourism development, and plans and proposals for such developments have come forward, none of these developments have been constructed to date). As such, here it is useful to look at the policies currently in place and then highlight where these policies would not address the driving forces and associated pressures, state and impacts from tourism development of the ejido and private lands.

The current international, federal and state laws, policies and agreements related to conservation in the BMLAC are fairly extensive; a thorough review is provided in Appendix 2 and summarized here. At the federal level the General Law for Ecological Balance and the Protection of the Environment (Ley General del Equilibrio Ecológico y la Protección al Ambiente - LEEGPA 1988) is the most important relevant law. It creates four types of instruments that are aimed at ensuring its general goals of environmental protection and sustainable development are met. The first is the ability for Marine Ecological Zoning and Ecological Land Zoning plans to be created at the national, regional and local levels. The second is Environmental Impact Assessments, which are required to be undertaken and approved by the federal government for many project types, including developments that affect coastal ecosystems, and works and activities in wetlands, lagoons, mangroves, estuaries and lakes connected to the sea. The third type of instrument is Natural Protected Areas. Once the federal government designates an area as a Natural Protected Area it receives special protection and a special

management plan must be created and implemented in the area. The final type of instrument under the LLEPGA is the Mexican Official Norms (Normas Oficiales Mexicanas – NOMs). There are four NOMS in particular that pertain to conservation in the BMALC: the first establishes special protection for species deemed at risk in Mexico; the second establishes special protection of mangroves and coastal wetlands; the third regulates whale watching activities; and the fourth protects the nesting habitat of sea turtles.

Two other important federal laws are the Federal Environmental Responsibility Law (Ley Federal de Responsabilidad Ambiental – LFRA 2013) and the General Wildlife Law (Ley General de Vida Silvestre – LGVS 2000). The LFRA regulates environmental liability that arises from damage to the environment, and outlines the repair and compensation required from the liable party for such damage. The LGVS promotes the sustainable exploitation of wildlife, and the conservation of wildlife at risk. It includes measures that allow protection of critical habitats for species of wildlife at risk. Other key federal laws govern fisheries and aquaculture, and water (see Appendix 2).

At the state level, the main piece of legislation related to conservation is the Law for Ecological Balance and Environmental Protection of the state of Baja California Sur (Ley de Equilibrio Ecologico y Proteccion del Ambiente del Estado de Baja California Sur – LEEPABCS 1991). The LEEPABCS includes general provisions for the protection of soil, water and air under state jurisdiction from contaminants and pollutants, and allows for the creation of zoning plans (natural protected areas may be established under these plans).

Some of these laws include enforceable conditions (NOMs regulating whale watching activities and impacts on mangroves, state laws regulating contaminants); however, during interviews local community members indicated that, in many cases the laws are not enforced or respected (personal communication with TSP, ECD, AEA 2008). Other mechanisms established by the regulatory regime could help strengthen protection in the area (protected areas, critical habitat, ecological zoning). While ENGOS are currently proposing that the islands and water of the BMALC be turned into a protected area, the protection is not proposed to apply to the private and ejido lands along the coast or to the urban centres of Puerto San Carlos and Puerto Adlofo Lopez Mateos. Furthermore, more than 40% of the landmass in Baja California Sur has

already been placed under Protected Area status and the state government is reluctant to approve of more protection due to the perceived constraints it would have on opportunities for economic growth (Gobierno de Baja California Sur 2008; SEMARNAT 2010). Finally, due to the issues with protected areas highlighted in the literature review, it is unlikely that this approach would be effective for the ejido and private lands.

Zoning also has the potential to provide further protection in the area. However, as of September 2013 the only established local Ecological Zoning Plan established in Baja California Sur was for the municipality of Los Cabos. In addition, as with the protected area approach, due to the distribution of costs and benefits of whale conservation (i.e. a large portion of the benefits occurring in the USA and Canada (Hoyt 1995) and high local opportunity costs of conservation), and the fact that such approaches would be generated based on local Baja California Sur/BMALC preferences, it is unlikely such a plan would result in an optimal level of conservation.

The Environmental Impact Assessments are another important tool; however, there are many incentives for industry to downplay the impacts outlined in their assessments. Furthermore, since these assessments are done at the project level, they do not typically adequately address the issue of cumulative impacts. Additionally, in some cases where a project cannot meet strict laws there are compensation provisions to allow for flexibility (e.g. after the NOM protecting mangroves was issued, the federal government passed legislation allowing mangroves forests to be damaged or destroyed as long as compensation is provided for the impacts). Compensation can be problematic because it is often difficult to recreate or restore habitats, and there are not always compensation opportunities in the areas that are impacted (i.e. compensation may have to happen elsewhere, which would result in a net loss to the local ecosystem).

The recently enacted Federal Environmental Responsibility Law (LFRA 2013) seems promising in theory; however, it is too early to tell how effective it will be in ensuring that the quality of important habitats, such as those related to the private and ejido lands in the BMALC, are protected. While this law may help ensure that persons or organizations will be made responsible in cases where their actions can clearly be tied to significant environmental damage (e.g. an oil spill), it is unclear whether it will be effective where the damages, although still significant, are small and caused by many

actions over a longer period of time and it is also unclear whether some damages can actually be reasonably compensated for.

Although the regulatory approaches are important for establishing a duty of care standard in the BMALC (see Chapter 5), they do not target the driving forces in the area. Innovative approaches that create direct, positive incentives for conservation have the potential to motivate landowners and resource users to conserve by creating alternative economic opportunities. In turn, they are more likely to be politically viable and to achieve a greater level of biodiversity conservation.

The Mexican Government and Incentive-based Conservation Approaches

In order to understand the prospect of implementing incentive-based conservation approaches in the BMALC it is important to examine the government's current perspective and efforts in regards to these approaches. In the past several years the government has created several policies that promote the use of market based conservation mechanisms. In 1992 the Secretary of Social Development (Secretaría de Desarrollo Social – SEDESOL) published a document called “Economic Instruments Applied to the Protection of the Environment” (SEDESOL 1992). Although this document did not directly produce any policies, its publication demonstrates that the Federal government has had an interest in market based environmental instruments for quite some time.

More significantly, in Article 21 of the LGEEPA it states that “the Federation, the States and the Federal District shall, in the bounds of their respective jurisdictions, design, develop and apply economic instruments that create incentives that are complementary to the objectives of environmental policy, including.....(III) giving incentives to people who act for the protection, preservation or restoration of the ecological balance.. ; and (IV) promoting a better social equity in the distribution of costs and benefits associated with the environment” (LGEEPA 1988). This section of the law clearly depicts the Federal Government's (or at a minimum SEMARNAT's) support for the use of economic or market-based instruments for environmental protection. This support is further substantiated through the government's use of market-based policies in the following conservation projects:

- ***ProArbol***. In 2007 Mexico's Forestry Commission (Comisión Nacional Forestal), initiated a project to promote the reforestation of large areas of land.

The basic plan for the project is for 250 million native trees to be planted and then protected and conserved by local landowners. These property owners will then receive payments from the government in order to create incentives for them to protect and conserve the forests.

- **Conservation of the Vaquita.** One of the National Institute of Ecology's (Instituto Nacional de Ecología - falls under SEMARNAT) priority projects for 2007 was the conservation of the vaquita (*Phocoena sinus*). The vaquita is a small porpoise that is endemic to the Gulf of California. During 2007 the species' population was estimated to be 150 individuals (Instituto Nacional de Ecología 2007). The National Institute of Ecology recognized that the main threat to the population was incidental catches during fishing operations (mainly gillnets). The government created a regulation to eliminate the use of gillnets. In order to compensate local fisherpeople for the lost economic opportunities, the government has created an on-going strategy using auctions and surveys to determine appropriate compensation levels.
- **Conservation of the Monarch Butterfly.** Another well-recognized program supported by the Mexican government through the National Commission of Natural Protected Areas and the state governments of Michoacán and Mexico, is the Monarch Butterfly conservation program. Much of the monarch butterfly's over-wintering habitat was designated as a wildlife reserve in 1980. It was soon recognized that the protected area was not large enough and did not have enough local support to effectively conserve the monarch butterfly's critical habitat. In order to solve the first problem the reserve was expanded in 2000. In order to help create conservation incentives amongst local communities (mainly ejidos) the Monarch Butterfly Conservation Fund was created. The fund is used to (a) purchase logging rights from local communities and (b) pay the communities for their conservation efforts (Missrie & Nelson 2005). Payments are based on the level of conservation achieved, which is assessed through GIS mapping of habitat. The results from this project have been positive, although reaching the specified conservation goals has taken longer than hoped (Rendón-Salinas et al. 2008).

The government of the state of Baja California Sur does not appear to have published any specific documents or laws demonstrating its interest in market based conservation policies. Unlike the federal Ecology Law, Baja California Sur does not have any reference to economic incentives in its ecology law. There is however one very relevant and important example of a market-based conservation project in Baja California Sur. The project is run by the Laguna San Ignacio Conservation Alliance (LSICA), a group of organizations that includes NGOs, Ejidos and community associations (there are no government agencies associated with the project). Their goal is to "*work with community based organizations and private land owners within the Laguna San Ignacio Wetland Complex to protect one-million acres of pristine coastal ecosystem*" (LSICA 2006, pg.1). Although the San Ignacio Lagoon is part of a UNESCO

(United Nations Educational, Scientific and Cultural Organization) biosphere reserve, the fact that ejido land policies have recently changed (making it possible for ejidos to sell their land), creates the threat that large-scale developers or land speculators could buy and eventually develop the land. In order to prevent environmental degradation and negative pressure on important gray whale habitat, the alliance has procured funding to create and purchase conservation easements on ejido and federal land in the area (LSICA 2006). Since there is no federal law allowing for conservation easements, they are instead set up under Baja California Sur's Civil Code (Código Civil para el Estado Libre y Soberano de Baja California Sur 1996) articles 1062, 1063 and 1114. As of 2006 the alliance had already established a 120,000 acre conservation easement consisting of all of the communal lands in of one of the local ejidos. In the agreement made with the ejido it receives an annual payment based upon the terms of the easement. So far very little feedback has come from this project, but if successful, this type of project could act as a prototype for other conservation projects in Baja California Sur, including the BMALC.

4.2.6. Suitable Incentive-based Policy Options

Based on information about local conditions, it is apparent that some of the incentive-based conservation options outlined in section 2.3 are not practicable for conservation of the private and ejido lands within the BMALC. The principal usufructuary rights and permits in the BMALC are fishery permits and fishery concessions (see Appendix 1). While some fishery permits are held by ejido and private landowners, the majority are held by fishery cooperatives within the urban centres around the BMLAC. Purchasing fishery permits and setting them aside for conservation would not address the main conservation threats from the private and ejido lands as described in the DPSIR (i.e. development). Furthermore, fishery concessions provide their holders with rights to set up fishery camps or semi-permanent residences on the federal lands around the BMLAC (see Appendix 1 for more details); these concessions do not apply to ejido and private lands. For these reasons, the acquisition and retirement of permits and usufructuary rights will not be included in the evaluation of options.

Payments based on the level of biodiversity conserved are not practicable in the case of private and ejido land conservation. It would be extremely difficult to directly connect the number of gray whales present in the BMALC each year directly to the land management actions of the landowners. Similarly, payments for ecosystem services do not make sense in this case, because there is limited information about the ecosystem services provided by the private and ejido lands.²¹ Payments based on the level of land conservation (i.e. square meters of land with natural land cover or low impact land uses) are more practicable and will be included in the evaluation.

After eliminating obviously unsuitable policies, the evaluation portion of this project examines the reduced list of five policies (Table 5).

Table 5. Definitions of Conservation Mechanism Evaluated in the Multi-Criteria Analysis

| Mechanism | Definition for the purposes of the evaluation |
|--------------------------------|--|
| Fee-simple Purchase | Purchase of full land rights from the current landowner. |
| Easement | The purchase of a legal right of use over the property of the landowner (i.e. An easement is a nonpossessory interest in another's land that entitles the holder only to the right to use such land in the specified manner). Easements run with the land in perpetuity. There are two types of easements for the purposes of this evaluation: <ul style="list-style-type: none"> • Negative Appurtenant Easements – one landowner (servient estate) grants to another landowner (dominant estate) the legal right to restrict them (the servient estate) from carrying out certain activities on their own property. • Negative In-gross Conservation Easements – a landowner (servient estate) grants to an individual or a legal entity the legal right to restrict them (the servient estate) from carrying out certain activities on their property. |
| Lease | Rental contract between the ENGO and the landowner. The ENGO pays the landowner a negotiated sum for the right to use or manage the land for conservation purposes. |
| Payments for Land Conservation | Regular repeated payments made by the ENGO to the landowner in exchange for a commitment by the landowner to manage the land under terms that both parties agree to. If the landowner fails to meet its commitments it will not receive |

²¹ Although mangroves provide crucial ecosystem services in the BMLAC (the most important of which is their primary productivity, which helps support the area's rich biodiversity (Yáñez-Arancibia et al. 1993)), most of them are located on federal lands and the Mexican government has already started a payment for ecosystem services initiative that applies to mangroves within the BMALC (Comisión Nacional Forestal 2009).

| | |
|----------------------|--|
| | subsequent payments. |
| Ecotourism Agreement | A formal agreement between the landowner and the ENGO, whereby the landowner agrees to manage the land for conservation under the terms specified in the agreement. In exchange the landowner receives negotiated in-kind benefits from the ENGO. These benefits are structured to support the landowner in pursuing sustainable ecotourism opportunities on their land. |

4.3. Summary

Completion of the DPSIR framework highlights the significant driving forces related to tourism development on the private and ejido lands in the BMLAC, as well as the adverse potential pressures, changes in state and impacts associated with such development. Although the laws governing conservation in the BMALC are extensive, they do not target the strong driving forces related to the local ejido and private lands. Incentive-based approaches have the potential fill this gap by motivating landowners and resource users to conserve through the creation of alternative economic opportunities. Furthermore, the DPSIR shows that some of the main factors for success for incentive-based approaches highlighted in the literature review are present in the BMALC. Finally, the framework reveals that several of the incentive-based approaches examined in the literature review are not appropriate for the ejido and private lands and that five of the approaches have the potential to be suitable.

Chapter 5.

Results 2: Multi-Criteria Policy Analysis of Conservation Mechanisms

5.1. Introduction

In this chapter, the incentive-based conservation approaches that were identified as being suitable for the ejido and private lands in the BMALC in Chapter 4 are evaluated under the following criteria: legality, level of conservation, persistence, flexibility, impact on peripheral and future conservation incentives, transparency, costs, equity and legitimacy.

5.2. Legality

Although the laws of Mexico and Baja California Sur do not prohibit use of the five mechanisms examined here, they do not explicitly provide regulations for incentive-based conservation mechanisms on private property (currently only a small handful of states in Mexico have enacted such legislation).²² Consequently, it becomes critical to examine how partial and full land-right transfer mechanisms under existing legislation can be employed for the purposes of conservation. Through a 'legal' analysis of each of the five mechanisms, key limitations are identified and more precise definitions of the options are generated and used in the remainder of the evaluation.

²² There is one exception to this, which is the option to register lands as private conservation areas (LGEEPA 1998, Article 59)

5.2.1. Fee-simple Purchase

Legally, the biggest constraints to fee-simple purchase of ejido and private land around the BMALC are the limitations on ownership outlined in section 27 of the Mexican Constitution (Constitución Política de los Estados Unidos Mexicanos 1917). Section 27, paragraph XV of the Constitution sets out limits on the amount of lands that a private person, whether an individual or an organization, may own in Mexico. As indicated by the Environmental Law Institute (2003), this limit is a function of the productivity of the land. According to Mexico's Agrarian Law (Ley Agraria 1992), Articles 115 to 133, for any one organization's ownership of irrigated productive agricultural lands the limit is 25 X 100 ha (2,500 ha), while the limit for dry arid lands (e.g. land in the BMALC) is approximately 25 X 800 ha (20,000 ha), where there are at least 25 individuals participating directly or indirectly in the organization.

The second constraint to fee-simple acquisition relates exclusively to ejido lands. As indicated in Chapter 4, relatively recent changes to the Mexican constitution have permitted the privatization and sale of ejido lands as long as certain conditions are met. One of the principal conditions is that the sale is restricted to those lands that have been parcelled out to individual ejidatarios by the ejido community. Each ejido member can only be given the rights to land for up to a maximum size of 5% of the full ejido landholdings, or the maximum size permitted for individual property ownership (100 hectares for productive irrigated land or 800 hectares for arid land), whichever is smaller (Ley Agraria 1992, Art. 47 & 81). In addition, persons that have worked the parcelized land for 1 year or more, ejidatarios and residents of the ejidal population centre have pre-emptive rights to buy the privatized land prior to it being made available for public purchase (Ley Agraria 1992, Art. 86). As of 2008, Ejido 5 was the only ejido in the BMALC to have legally parcelled out significant portions of its lands to individual ejidatarios.

Although communal (non-parcelized) ejido lands cannot be sold as private property (Muñoz-Piña et al. 2008), the ejido can elect to transfer the ownership to commercial or civil companies. In order for this transfer to be legitimate, the Agrarian Department must deem the company's plans for the land as rational, sustainable and beneficial to the ejido, and the company must show that they will meet several specific

conditions concerning their finances and any future liquidation (Ley Agraria 1992, Art. 75).

In order to circumvent the limitations on private ownership, conservation organizations in Mexico have used fidecomisos (land trusts), which are sanctioned under Mexico's General Law of Title and Credit Operations (Ley General de Títulos y Operaciones de Crédito 1932). With a fidecomiso, the land buyer purchases full rights to the land, but the fee-simple title is technically held in trust by a financial institution. The laws limiting the amount of land that an individual or private entity can hold do not apply to fidecomisos (Environmental Law Institute 2003). However, depending on the type of fidecomiso, there are varying restrictions on the maximum period of time that the contract can last (generally a maximum of 50 years, but some are restricted to a maximum of 30 years) (Ley General de Títulos y Operaciones de Crédito 1932, Art. 394). The contract can be renewed at the end of each term. This obligation for renewal creates a potential impediment for guaranteeing long-term conservation (i.e. creates a level of vulnerability in the contract). However, under Article 394, section III of Mexico's General Law of Title and Credit Operations (Ley General de Títulos y Operaciones de Crédito 1932) the contracts can be granted for an infinite amount of time where a non-profit scientific museum or an art gallery is established on the land.

In the interest of clarity and scope, for the analysis of fee-simple acquisition under the remaining criteria in this chapter, it is assumed that the acquisition would be done through a land trust and that the land would be managed as a not-for-profit museum of natural history. This approach is valid since one of the primary advantages of fee-simple purchase is the perpetual protection of the land; due to the aforementioned legal constraints, conservation investors cannot be provided a solid level of assurance of perpetual protection unless this approach is used. Museums of natural history have been used to provide perpetual protection of large land acquisitions in other cases in Mexico (Environmental Law Institute 2003). Provided that this approach is used and the ENGO only purchases lands that have met the requirements of privatization, this mechanism (land ownership) would be recognized and enforced under Mexican and Baja California Sur law.

5.2.2. Easement

Swift et al. (2004) distinguish between two types of easements; “In-gross” easements, which are held by a third party such as an ENGO or government body, and appurtenant easements, which are conventionally held by a dominant estate located adjacent to the servient estate. The servient estate is required to abide by the terms of the easement. Appurtenant easements can also be held reciprocally by adjoining properties, or by non-adjacent properties that have a strong enough relationship to establish an adequate nexus (Swift et al. 2004). One advantage of appurtenant easements is that there are no specified limits on the amount of land that they can be placed over.

While Veracruz, Nuevo Leon and Quintana Roo are the only jurisdictions in Mexico with specific legislation for in-gross conservation easements (Swift et al. 2004), appurtenant easements are legalized through both the BAJA CALIFORNIA SUR and Mexican civil codes. Voluntary appurtenant easements are legitimized under Article 1114 of the Baja California Sur civil code (Código Civil para el Estado Libre y Soberano de Baja California Sur 1996). However, they can be extinguished if they remain unused for a period of time in the case of apparent and continuous easements, or when they are violated and subsequently unused for a length of time, in the case of discontinuous or non-apparent easements (Código Civil para el Estado Libre y Soberano de Baja California Sur 1996, Art.1133). Therefore, despite the statutory legitimacy of appurtenant easements, monitoring and enforcement play an important role in their persistence. Furthermore, as the Environmental Law Institute (2003) and the Laguna San Ignacio Conservation Alliance (2006) indicate, in order to be considered legitimate, appurtenant conservation easements must be signed by a notary and inscribed in the public registry when they are on private property, and in the Registro Agrario Nacional when they are on ejido property. In order to further bolster the legitimacy of these easements, it is important to obtain the official support of local, regional and national stakeholders, preferably in the form of signed accords (Laguna San Ignacio Conservation Alliance 2006).

Even though appurtenant easements were not originally created for use as a conservation tool, they have been used to protect habitats in several cases, including a recent conservation initiative in Baja California Sur. In Laguna San Ignacio, Baja

California Sur, a conservation alliance consisting of a local ejido and several international and regional ENGOs, has established an easement on a large coastal ejido property and is working to set up easements on other properties around the lagoon (Laguna San Ignacio Conservation Alliance 2006).

Although appurtenant easements are technically legal, their use as a conservation tool is not explicitly recognized by Baja California Sur or federal Mexican legislation. As such, the willingness for courts to uphold appurtenant conservation easements when they are violated is still somewhat uncertain. In Cope's (2005, pg. 28) investigation of conservation easements in Latin America, she finds that "*conservation easements are more effective at meeting conservation goals when applied within a legal framework that recognizes the tool*", and that, "*in-gross easements provide more legal security for NGOs to manage and enforce restrictions than appurtenant conservation easements*". Given some of the legal uncertainties surrounding the use of appurtenant easements, they receive a lower score than fee-simple purchase for the legality criterion of this analysis (see Table 6).

5.2.3. Lease

Leases are authorized under article 2303 of the Baja California Sur civil code (Código Civil para el Estado Libre y Soberano de Baja California Sur 1996). They are permitted on both parcelized and communal ejido land, as well as private land. Although there is no explicit discussion of leases for conservation within the civil code, there is also nothing prohibiting their use. Furthermore there are examples of conservation leases being used in other Mexican states that lack explicit legislation for support of their use as a conservation tool. For example, in Chihuahua, Mexico, a lease is being used to conserve several small breeding colonies of the thick-billed parrot. The Wildlands Project, in partnership with several Mexican conservation groups, established the lease with Ejido Cebadillas in 2000. In exchange for the land-use restrictions associated with the lease (primarily forestry activities), the ejido receives funding and expertise that will aid the ejido in finding more sustainable economic development alternatives, and cash payments (Norris 2002). The conservation groups hope that the lease will buy them more time to establish a permanent protection mechanism on the land (Norris 2002).

While leases are not explicitly recognized as a conservation tool in Baja California Sur, they are a common and well-recognized means of temporarily transferring partial property rights. Unlike easements, a lease is a generic instrument used for many purposes. The regulations for leases in the Baja California Sur civil code provide solid support for the use of this instrument for any legitimate purpose. As such, in this evaluation they receive a higher rating on the legality criterion than easements and a rating as high as for the legality criterion for fee-simple purchase.

5.2.4. Payments for Land Conservation

Mexico and the state of Baja California Sur currently lack underpinning policies and legislation for payments for land conservation. However, the recurrent payment structure of this mechanism gives rise to some level of self-enforcement (i.e. payments are not made when land conservation has not happened), which greatly diminishes the requirement for legislative support and enforcement. Furthermore, the Mexican Federal government has shown support for the use of these types of instruments for environmental protection, as indicated in Chapter 4, section 4.3.5.2. This support is depicted in article 21 of the LGEEPA and by the many examples of payment instruments being used in Mexico (see section 4.3.5.2). Given the much smaller need for legislative support and enforcement for this instrument, payments for land conservation rate as high as fee-simple land purchase and leases under the legality criterion.

5.2.5. Ecotourism Agreement

From a legal standpoint ecotourism agreements are arguably less sound than the other policy options; as such they receive the lowest rating. While leases, easements and fee-simple purchases involve the transfer of property rights through well-established policy tools, conservation agreements involve the transfer of contract rights through ad hoc contractual arrangements (Wolman 2004). It is widely recognized that contract rights in Mexico are weak due to ineffective enforcement institutions (Haber 2005). Furthermore, while Veracruz, Quintano Roo and Nuevo Leon all have well-established policies for conservation agreements, Baja California Sur currently does not; this may weaken government and judicial recognition and enforcement of the agreement. Like conservation easements, and the other mechanisms, the legitimacy of conservation

agreements can be bolstered through written approvals from pertinent government agencies.

5.3. Level of Protection

5.3.1. Fee-simple Purchase

Theoretically, fee-simple purchase of land will result in the highest level of land conservation. By purchasing the land, an ENGO acquires the rights to fully control activities on the land (within the bounds of the law - e.g. under Mexico's Civil Code it is possible for the government to expropriate and use the lands for public utility purposes). The ENGO's goal is presumed to be to achieve the highest possible level of conservation within its budget and information constraints. Consequently, it would likely employ minimal negative land management practices and likely some level of positive conservation practices as well. The requirement to manage the land as a natural history museum would make it necessary for the ENGO to establish some small developments on the site such as a museum office and/or visitor's centre, as well as some trails and other amenities. However, it is likely that these activities, if managed properly, would have minimal negative impacts on conservation.

5.3.2. Lease

Leases are also likely to provide a fairly high level of conservation. However, unlike fee-simple purchase, the terms of the lease have to be negotiated with the landowner. The ENGO would typically be provided with a high level of control over land use and land management activities, but not full control (i.e. conceivably it may not be allowed to perform conservation practices that could impede the landowners future use of the land – e.g. controlled burns). For this criterion leases rate lower than fee-simple purchase but higher than the other three mechanisms, which typically allow for a greater level of landowner use.

5.3.3. Easement, Payments for Land Conservation, Ecotourism Agreement

The level of conservation that easements, payments for conservation or ecotourism agreements achieve is highly dependent on the specific land use and management terms negotiated with the landowner. It is unlikely that the current activities on the private and ejido lands surrounding the BMALC are having a significant negative impact on gray whales, which is partially evidenced by the sustained use of the lagoon complex by the whales. Furthermore, there is a strong need for further economic opportunities in the area (Sawatsky 2008; personal communication with EM, PSC, MAV, PM 2008). The landowners, surrounding local communities and local governments are looking to generate income from more tourism activities in the area (see Chapter 4). Therefore, it is likely that any arrangements negotiated with the landowners will either be very costly or need to allow for current land use activities to carry on and/or allow for some level of tourism development. Conversely, it is illogical for an ENGO interested in conservation to invest in a mechanism that permits activities with a high potential to cause significant adverse conservation impacts. As a result, these mechanisms would result in a significant level of protection, but they would also likely allow current land-use activities to continue and could (or, would in the case of ecotourism agreements) allow some lower impact eco-tourism development to occur on the land. These mechanisms would therefore result in a lower level of protection than fee-simple purchase, but given the current pressure for tourism development in the area, they would result in a higher level of protection than the projected status quo.

5.4. Persistence

Persistence of the mechanism plays a very important role in conservation and the willingness of people to fund conservation. An individual's willingness to pay for or contribute to a conservation program will vary significantly depending on both the level of conservation the program is likely to achieve, as well as the duration of a program. Although, to a large extent, persistence is a function of the particular conservation mechanism employed, persistence will also depend on the ability of the ENGO to enforce the contract, as well as its ability to monitor the land to determine when enforcement actions are necessary.

5.4.1. Fee-simple Purchase

Purchasing land in fee-simple would technically provide the ENGO with land rights in perpetuity. However, this is contingent on: 1) the ENGO's internal ability to retain their rights to the land (e.g. there are instances of ENGOs selling conservation lands due to dire financial circumstances);²³ 2) the government's continued recognition of the ENGO's rights to the land (e.g. expropriation for public utilities); and 3) the ENGO's ability to ensure that those rights are not eroded over time (e.g. squatters). The two latter factors can be managed through adequate monitoring and enforcement and by acquiring endorsements for the easement from various levels of government. Monitoring and enforcing land-use activities and their impacts on fee-simple conservation lands is relatively straightforward because the ENGO is the sole property rights holder and its activities on the land are likely to be minimal (Parker 2004). The first factor is one that was also identified during personal interviews with Mexican officials. In the interviews several government officials indicated that purchasing land through ENGOs could be problematic because the goals and objectives of these organizations tend to change over time (personal communication with TSP, FG 2008). One approach that can and has been used to manage this issue is for several conservation organizations to enter into conservation agreements together through an alliance (e.g. Laguna San Ignacio Conservation Alliance). Another option is to register purchased lands as private conservation areas within Mexico (10 year renewable term), which would give some added protection to the land and help ensure government support in maintaining the land for the purposes of conservation (Environmental Law Institute 2003). However, at this point it is not clear whether lands registered in trust as a museum of natural history can also be registered as a private conservation area.

Overall, given the relative ease of monitoring and enforcement as well as the level of control that the ENGO has over future land use decisions, it is reasonable to conclude that fee-simple purchase of the land would be more persistent than any of the other mechanisms.

²³ See: <http://www.semarnat.gob.mx/temas/ordenamientoecologico/Paginas/ODecretados.aspx> ; Retrieved September 2013.

5.4.2. Easement

Easements are theoretically tied to the land in perpetuity. However, in practice and depending on interpretation by courts, easements are often eroded over time (Ociepka 2006).²⁴ When lands are sold, new owners are frequently unaware that there is an easement attached to the land, and/or unaware of the terms of the easement and their significance. Existing landowners lack the incentives necessary to ensure that prospective purchasers are made aware of the legal encumbrances on the land because they want to maximize profit from the sale of their lands.

Parkhurst and Shogren (2003, pg. 1131) provide an important perspective on the persistence of easements as a land conservation tool.

The easement contract specifies conservation requirements to be permanent. But easements are susceptible to subsequent landowners scrutinizing the easement in search of loopholes by which to increase personal returns to the land. To appease new landowners, the agreements may have to be renegotiated or the conservator may have to force the landowner to comply by taking legal action. It is likely that the landowners gain more flexibility in using the land, meanwhile reducing the conservation commitments of the easement. Over time, conservation commitments may be significantly reduced, rendering the conservation commitment insufficient to achieve its initial goal, much the same as if the land had been developed completely.

Furthermore, as indicated under the legality criterion, conservation easements are not provided for in the Mexican or Baja California Sur civil codes. Although voluntary appurtenant easements have been used as a conservation mechanism, their use is somewhat experimental since they were not originally designed for this purpose. Therefore, there is still some uncertainty over how well the courts would uphold the ENGO's rights in cases where landowners infringe upon the easement terms. In addition to acquiring written approvals from governments, one option to further bolster enforcement is to design the easement with a recurrent payment structure that provides an on-going stream of conservation incentives. These incentives would promote self-enforcement of the easement and conceivably make it more difficult for a judge to rule against the validity of the easement. Like fee-simple purchase, easements are typically

²⁴ Also see: <http://www.conservationgateway.org/Pages/scifest-montambault.aspx>

fully paid for up front. However, some conservation organizations have designed easements with benefits that are provided on an on-going basis. For example, recurrent payments are being used in the conservation easement that the Laguna San Ignacio Conservation Alliance has established with an Ejido Luis Echeverría Alvarez. The ejido has opted to forgo the land use rights specified in the easement for a land trust that provides the ejido with \$25,000 in interest revenues each year (Koch et al. 2009; Laguna San Ignacio Conservation Alliance 2006).

Monitoring of easements in the BMALC is vital to their success as a conservation instrument, because legislation permits their extinguishment if they are not used. However, monitoring is much more complicated under an arrangement that divides land-use rights amongst multiple parties (Parker 2004). Instead of being responsible for solely their land use decisions, the ENGO is responsible for ensuring that the landowner is managing the land according to the terms in the easement. Difficulty of monitoring is higher because there are more activities on the land and the landowner has an incentive to hide non-compliant activities from the ENGO. Monitoring is further complicated by the fact that not all of the activities that are problematic for conservation will be anticipated in the easement negotiations or terms; responsibility and consequences of these activities will remain unclear.

Easements in Baja California Sur, although intended to be a perpetual instrument, are considered less persistent than fee-simple purchase due to the aforementioned difficulties associated with their monitoring and enforcement.

5.4.3. Lease

Leasing land for conservation can provide continued protection on the land for a maximum of 20 years, after which the terms of the lease can be renewed. According to article 2303 of the Baja California Sur civil code, the lease cannot exceed 10 years for housing, 15 years for trade related uses, and 20 years for industrial or agricultural uses. In cases where the property is sold while there is a lease on it, the lease continues to the end of its term provided that the lessee abides by the terms and continues to pay rent (Código Civil para el Estado Libre y Soberano de Baja California Sur 1996, Art. 2399). Leases also have similar monitoring and enforcement issues as an easement, although

typical recurrent payment structure associated with leases makes them somewhat self-enforcing.

5.4.4. Payments for Land Conservation

In terms of their structure, payments for land conservation are the least persistent mechanism. Unlike the other mechanisms there is generally little to no ability to enforce the arrangement through legal means. Therefore the persistence of this mechanism is fully reliant on the landowner's continued willingness to participate in the arrangement. The landowner's choice to participate will depend heavily on their elasticity of supply for conservation, the opportunity costs of conservation and the payment level provided by the ENGO. Because it is unlikely that the landowners in the BMALC have a perfectly inelastic conservation supply curve, and the opportunity costs in the area are dynamic and are perceived to be high (personal communication with ER, EM, AEA, ECD 2008), the ENGO would need to be prepared to alter their payment levels (potentially drastically) in order to maintain the interest of the landowner. However, as indicated under the 'impact on peripheral and future conservation incentives' criterion, a conservation organization's willingness to change payment levels can cause other problems (temporal opportunism; incentive for the landowner to actively seek external investment interests). Monitoring is important for ensuring that the landowner only receives payments when they have met their conservation obligations. Monitoring difficulties would be similar to those described under the lease paragraph above.

5.4.5. Ecotourism Agreement

As is the case with payments for land conservation, ecotourism agreements are tied to the landowners instead of the land. Although some countries have developed legislation to allow conservation agreements to run with the land (Bowles et al. 1998), this is not an option in Baja California Sur. Thus, the persistence of the agreement comes from the ENGO's ability to monitor and enforce the contract as well as its ability to convince succeeding landowners to enter into conservation agreements. As indicated under the legality criterion, contract right enforcement institutions in Mexico are relatively weak, which results in a low ability to legally enforce ecotourism agreements. However in order to promote self-enforcement, the agreement can be designed to provide

recurrent ecotourism benefits. It is important to note that where these benefits are in-kind, the ability to provide them recurrently becomes problematic, both because it may be difficult to find recurrent benefits that the landowners desire and, as Milne and Niesten (2009) indicate, withholding some types of these benefits when the landowner has not met their conservation commitments can be controversial and problematic (e.g. providing school teachers or health care). Monitoring issues for ecotourism agreements would be similar to those described for easements and leases.

5.5. Flexibility

The ability of a conservation mechanism to be flexible, both in terms of the land management regime and the particular parcels of land it protects, is important for its long-term effectiveness. In the BMALC there is currently a limited understanding of the impacts that land-use activities have on gray whales, and of the conservation values across the landscape. As such, it is important to be able to change land management plans and commitments as new information is gathered over time. Furthermore, there are factors external to land use impacts (climate change, pressure on the ecosystem from local fisheries) that could cause habitat values in the area to drastically decrease. As Mahoney (2002) indicates, without the ability to change land-use decisions, future generations may face significant costs from land-use restrictions.

5.5.1. Fee-simple Purchase

In terms of management, fee-simple purchase is very flexible. The purchaser (ENGO) is the sole land manager and he or she can change management plans without the encumbrance of negotiating with other land right holders. Also, purchased lands can later be sold if they are no longer deemed valuable for conservation, or sold with conservation easements tied to them.

5.5.2. Lease

Under a lease the ENGO will have a significant level of flexibility to change most land management decisions (depending, to an extent, on the terms of the lease). However, large management decisions are likely to require agreement by both parties, and changes to the lease contract; this could be a costly process, potentially involving

lawyers and approvals by multiple authorities. In terms of flexibility of the parcels protected, leases have some flexibility since they are easily and naturally extinguished at the end of their term. They can also be terminated prior to the end of their term by agreement from both parties (Código Civil para el Estado Libre y Soberano de Baja California Sur 1996, Art. 2387). Furthermore, Article 2387 indicates that a lease can conclude if the deadlines in the contract are missed. As such, the ENGO could terminate the lease by simply ceasing to make payments. However, this approach would likely be avoided due to the impact it would have on the conservation organization's reputation and its ability to acquire landowners' trust in future agreements. Furthermore, the ENGO could potentially be sued for the payments. Overall, leases are less flexible than fee-simple purchase in terms of land management and lands conserved

5.5.3. Easements and Ecotourism Agreement

Management of easements and ecotourism agreements is less flexible than the other approaches. In order to change easement terms they would have to be renegotiated with the landowners, redrafted by lawyers and re-approved by various authorities. Furthermore, although easements can be extinguished or sold back to the landowner, given the complex legalities associated with this process and large number of landowners around the BMALC, this undertaking would be very time consuming and costly (Mahoney 2002). Although the Baja California Sur civil code allows for appurtenant easements to be automatically extinguished when they are violated and not enforced (see section 5.1.2), this approach would result in significant sunk costs to the ENGO, and is likely not a preferred course of action.

Like easements, the terms of ecotourism agreements can be renegotiated, but this requires legal expertise and multiple approvals. Cessation of these contracts is contingent upon agreement from the landowner. Due to the relatively ineffective contract right enforcement institutions in Mexico it would likely be fairly easy for the ENGO to simply renege on the agreement without a large legal risk. However, as with leases, this is likely to be an unwise choice due to the potential impact it would have on the ENGO's reputation.

5.5.4. Payments for Land Conservation

In terms of management flexibility, payments for land conservation are more flexible than easements and ecotourism agreements since negotiations and agreements over the management terms do not require legal expertise. However, they are less flexible than fee-simple purchase and leases, because management changes will typically require negotiations with the landowner (i.e. convincing the landowner to change how he/she is managing the land). Payments for land conservation are the most flexible mechanism in terms of changing the parcels of lands conserved. Termination of these contracts is straightforward, due to the lack of a legally binding arrangement.

Since leases, payments for land conservation and ecotourism agreements are not land rights that can be sold or exchanged, all acquisition payments associated with them would be considered sunk costs. As studies in behavioural economics suggest, these sunk costs may influence the ENGO to be somewhat inflexible in switching the areas that it chooses to conserve (Arkes and Blumer 1985). In particular, terminating leases, payments or agreements on some lands may make conservation donors feel like their money has been wasted and may negatively influence their decision to support further conservation initiatives in the area or to support the ENGO. On the other hand, it would be expected that some of the acquisition costs associated with fee-simple purchase and easements could be recovered through the sale of those rights.

5.6. Impact on Peripheral and Future Conservation Incentives

An important consideration in the application of any of the mechanisms is the impact that they may have on future conservation efforts and the conservation efforts of surrounding and future landowners and communities. In examining these prospective impacts two concepts are important: duty of care and market feedbacks. Unlike the other criteria, the concepts discussed in this section provide generalized implications for incentive-based conservation mechanisms rather than specific implications for each of the different approaches.

Recently a significant body of literature has developed regarding the concept of duty of care in relation to the environment (Bates 2001; Earl et al. 2010; Hatefield-Dodds 2006; Wentworth Group 2003; Young et al. 2003). Duty of care has been summarized

as follows: “*everyone who influences the management of the risk to the environment to take all reasonable and practical steps to prevent harm to the environment that could have been reasonably foreseen*” (Industry Commission 1998, p. 134, as cited in Young et al. 2003). In countries with a common law system, the concept of duty of care is tied to the law of torts, while in civil law countries, such as Mexico, it is tied to delict law. Duty of care is commonly interpreted as the minimum standards expected by a community (Wentworth Group 2002). However, to an extent, particularly in civil law countries, duty of care expectations are reflected in laws (Hatfield-Dodds 2006). As Hatfield-Dodds (2006) indicates, increases in environmental quality require the implementation of additional regulations and/or penalties for non-compliance, or rewards for voluntary actions. Where rewards for voluntary actions are applied, beneficiaries pay for the environmental quality increase, but the duty of care for polluters (or in our case, landowners) remains the same.

The mechanisms evaluated within this chapter can all be categorized as rewards/incentives for voluntary actions. As such, employment of these mechanisms will not result in an increase in duty of care. In fact, their use perpetuates the notion that beneficiaries, rather than polluters, should face the full burden and responsibility of the costs imposed by any conservation measure beyond the current duty of care. While this approach makes sense in many respects (as indicated in Chapter 1 and 2), it requires constant and sufficient funds to entice all polluters/landowners to employ the voluntary conservation mechanisms. When initial funds are insufficient, or changes in societal preferences causes them to decrease over time, incentive-based mechanisms are unlikely to be sufficient for achieving or maintaining the integrity of the ecosystem.

Recognizing funding limitations, and the need for a safe minimum standard, Hatfield-Dodds (2006) and the Wentworth Group (2003) have pointed towards the catchment care principle. This principle postulates that individual landowners have a responsibility to manage their land in a way that avoids practices that harm the long-term interests of resource users as a whole; it implies the implementation of a minimum environmental standard (catchment care benchmark) that is based on ecosystem integrity rather than current social preferences (Hatfield-Dodds 2006). Young et al. (2003) and Hatfield-Dodds (2006) argue that incentives for voluntary conservation should only be used to initiate an increase in environmental quality above this standard.

After a period of time, penalties and mandatory standards should be reformed to increase the statutory duty of care. Further increases in incentives should then be succeeded by increases in mandatory standards until the environmental quality achieved is at least as high as the catchment care benchmark (preferably higher since the benchmark may fluctuate as new scientific knowledge is gathered). In achieving higher mandatory standards, these authors argue, penalties should be put in place for non-compliance with the standard, transitional assistance should be provided to landowners for reclamation and for above average costs of achieving the standard and incentives mechanisms should be retained solely for conservation actions which are above and beyond those defined by the mandatory standards or new statutory duty of care.

In short, Hatfield-Dodds (2006) and the Wentworth Group (2002), argue for a level of conservation that is based on ecological integrity rather than societal preferences and the market's ability to capture those preferences. They demonstrate that incentive-based approaches are important for initial increases in environmental quality, but they may not be able to achieve and maintain an ecologically sound level of conservation in the long-term.

In relation to conservation in the BMALC, these arguments imply that incentive-based approaches should (eventually) be followed with increased statutory standards in order for a persistent and adequate level of ecological integrity to be achieved. Without an accompanying rise in statutory duty of care, the conservation incentives may fail to achieve conservation objectives in the long-term. Although this argument is more readily applied to leases, payments for land conservation and ecotourism agreements due to their more temporary nature, it is still relevant for easements and fee-simple purchase of lands since these approaches can be affected by changes in social preferences (as discussed under the permanency criterion).

Market feedbacks also have a significant impact on future, as well as peripheral, conservation incentives. For instance, Armsworth et al. (2006, pg. 5403) show that full purchase of land "*affects land prices and generates feedbacks that can undermine conservation goals, either by displacing development toward biologically valuable areas or by accelerating its pace*". Armsworth et al. (2006) demonstrate that setting areas of land aside for conservation can make a region more attractive to developers looking to profit from local conservation amenities.

Landowners can take advantage of these feedbacks and the increasing returns to scale that conservation organizations face for conserving additional lands, by holding out on entering into conservation contracts (spatial opportunism) (Elmendorf 2005). If the landowner recognizes that the quality of remaining land will be higher for both conservation and tourism purposes when new parcels of land are set aside for conservation, and that the quantity of lands around the BMALC is limited (and decreasing with every parcel of land that is set aside for conservation), then they may recognize that over time the demand curve for land will shift outward, driving price up and enabling them to capture more scarcity rents.

For instance, in the BMALC the conservation amenities provided by a potential federal protected area, as well as any additional amenities provided by effectuated incentive-based conservation mechanisms will conceivably increase the attractiveness of the area for tourism investors (Armsworth et al. 2006). The remaining unprotected lands could become much more valuable for tourism development (decrease in supply and rightward shift in the demand curve). The increase in scarcity rents available for landowners to capture, would make the sale of their lands (or land rights) a more attractive option, and make it more costly for an ENGO to acquire the land/rights for conservation. These effects would be greater under purchase of fee-simple land rights and conservation easements, and smaller under payments for land conservation, ecotourism agreements and leases. This is due to the less permanent nature of these latter mechanisms, which decreases the certainty that ecotourism and conservation values in the area would remain high in the future. It is worthwhile noting that conservation easements can also be designed to be terminable (can be terminated without penalty to by the holder – easement would be paid for annually rather than with a one-shot cash payment) (Elmendorf 2005).

Elmendorf (2005) points to several potential remedies for the spatial opportunism problem. First, the ENGO could enter into “most-favored-nation” and/or all or nothing contracts with landowners around the BMALC. However, these approaches could drive pricing to be higher than its social cost because the price is set at the most adverse landowner’s price. And second, the ENGO can contract through landowner controlled special districts (landowners within a district vote on whether they should collectively become part of a conservation district (2/3 majority wins, etc.) – then the district would

have the ability to compel its members to participate in district-negotiated conservation contracts). Unfortunately, while this last option is promising, and could keep costs low for a conservation organization, it also requires legislative backing, which could be difficult to obtain.

In addition, impacts of spatial opportunism can be reduced if the ENGO focuses its initial conservation and negotiation efforts on the lands that are most valuable for conservation. This principle may seem fairly straightforward and obvious, but conservation organizations often apply incentive-based mechanisms in an opportunistic, rather than planned manner (e.g. Canada's ecological gifts program, Environment Canada 2005). Unfortunately, this concept is more straightforward in theory than in practice. The lack of information on the heterogeneous conservation values and ecological functions across the landscape makes it difficult to determine which parts of the land have a high conservation value. For instance, although it is widely accepted that large coastal land developments in the BMALC would be detrimental to gray whale conservation (Dedina 2000), there is a lack of scientific evidence to demonstrate which land conservation factors are the most important for gray whale conservation and what development threshold the gray whales can withstand.

The second market feedback is temporal opportunism. As indicated by Elmendorf (2004, pg. 529) contracts with limited time periods (leases and payments for land conservation) present a distinct cost-related problem, which has the potential to significantly increase the price of the lease over time:

“temporal opportunism..<is the issue>..whereby the landowner tries to appropriate the land trust's initial specific investment on her parcel by demanding an excessive price in subsequent contracting periods”.

This feedback applies to the mechanisms that have limited contracting periods (payments for land conservation, leases and ecotourism agreements). As Elmendorf (2005) indicates, this problem can be averted if the leaseholder develops a reputation for refusing to concede to these types of demands. Another related problem is that the landowner has an incentive to actively seek out interest from external investors between contract periods in order to leverage higher payment terms in subsequent contracting periods with the ENGO.

5.7. Transparency

Transparency is important because it enables accountability of the policy implementers. Here it is evaluated by how easy it is for stakeholders to understand the mechanism, how easy it is to measure and communicate its conservation outcomes and how clear the conservation roles and responsibilities of those involved in implementing the policy are. Public access to financial and scientific data is another factor this is often used to evaluate transparency; it is not considered in this analysis because it is not contingent on the type of mechanism applied.

5.7.1. Fee-simple Purchase and Lease

Conservation through purchasing land (albeit through a land trust) is arguably the most transparent mechanism. Fee-simple purchase of lands is a straightforward and universal practice that is easy for all stakeholders to understand. Furthermore, as long as the ENGO continues to manage the land for conservation, and property rights are not eroded over time (see legality and permanency sections) the conservation outcomes can be easily recognized. The roles and accountability of the organizations involved are clear, since the ENGO is the sole landowner and land manager. If the land is purchased (or any of the other mechanisms are implemented) through a conservation alliance (several ENGOs), roles and accountability are more ambiguous, but arguably still more straightforward than any of the other mechanisms, which share property rights and/or management responsibilities with the current landowners.

Fee-simple purchase and leases rate the highest in terms of measuring and communicating policy outcomes. It is difficult to directly link the impacts of any of the mechanisms to a clear measure of gray whale conservation, such as the number of whales in the bay each year. This is because many factors other than private and ejido land conservation impact gray whale conservation within the BMALC. However, it is reasonable to use the extent of land conserved as a proxy for gray whale conservation. Using this proxy, it is straightforward to measure and communicate the conservation outcomes of fee-simple purchase; land use activities not congruent with conservation are likely to be minimal under these two policies, and the ENGO is well positioned to keep track of and monitor any impacts on the land.

Leases also rate high in terms of understanding the instrument and its impacts on conservation, since leasing lands is a common practice throughout the world and leases would result in a high level of land conservation. Easements, payments for land conservation and ecotourism agreements are not as common or straightforward, and therefore are more difficult for stakeholders to understand.

5.7.2. Easement, Payments for Land Conservation and Ecotourism Agreement

Easements, payments for conservation and ecotourism agreements are all likely to allow for a greater level of development on the lands than fee-simple purchase or leases, therefore they rate lower in respect to the ease of recognizing their impacts on conservation. However, ecotourism agreements rate the lowest, because this instrument promotes development on the land. The ease of measuring and communicating the policy outcomes is also less for these three mechanisms, because they allow for greater activities levels on the land and the landowner has an incentive to hide activities that are discordant with the terms of the policy.

The roles and accountability of the players is clear for payments for land conservation (landowner has the responsibility to manage the land in a way that is congruent with conservation in order to obtain the payment or benefit). It is slightly less clear for ecotourism agreements (it may not be clear who is responsible for negative conservation consequences that occur as a result of the ecotourism initiatives that have been paid for by the conservation organization). It is even less clear for easements and leases, where the property rights are split between two parties (ENGO and current landowner).

Overall, taking all of the factors that contribute to transparency into consideration, fee-simple purchase is the most transparent mechanism, followed by leases, easements and payments for land conservation, and finally, tourism agreements.

5.8. Equity

This section of the evaluation focuses on the evenness of the distribution of costs and benefits and associated utilities amongst the key stakeholders. The principal stakeholders are: international conservation beneficiaries (whale watching companies

along the pacific coast in the USA and Canada); whale watchers; individuals with existence values for gray whale conservation; the ENGO, private and ejido landowners, local communities (in the BMALC), the local government, the state government and the federal government.

Several substantiated assumptions will be made here in order to focus the analysis of equity on the salient areas (i.e. areas where it is more likely that costs incurred by groups of stakeholders would be greater than the benefits they receive). First, the benefits to the ENGO and international conservation beneficiaries are assumed to be at least equivalent to the costs they incur (this is valid given that it would be irrational for the ENGO to enter into a contract where the costs are greater than the benefits they receive). Second, the costs to the landowner (opportunity costs, transaction costs and management costs) are assumed to, at minimum, be made up for by the payments provided by the ENGO (cash or in-kind); this is valid given that all of the mechanisms are voluntary, and it is irrational for landowners to enter into transactions where the costs they incur are higher than the benefit they receive from the transaction. Given the above, the distribution of costs and benefits to international conservation beneficiaries, the ENGO and the private and ejido landowners will not be a focus of this evaluation

The above assumptions help focus the analysis, but it is recognized that in actuality there are forces that may prevent landowners and the ENGO from acting rationally. People and organizations with the potential to gain from tourism development but who would not realize the direct benefits of an incentive-based mechanism (e.g. developers, business owners in the towns around the BMALC, branches of government focused on economic development – particularly powerful elites) could have motives to undermine the incentive-based approaches or to try and influence their implementation in a way that would allow them to realize some of the benefits. Furthermore, there may be inequities that arise within landowner groups. For example, with respect to ejidos, if parcelized land is not distributed evenly across ejido members (e.g. if some ejido members gain rights to the coastal lands that are more valuable for development and others do not), or, in the case of payments for land conservation or ecotourism agreements, if benefits are not distributed evenly among ejido members, large inequities could arise within each ejido. While these considerations are important, they are not

examined in detail under the individual mechanisms because they would apply to all of the approaches similarly...

The remaining stakeholders are the local communities and the local, state and federal government. The sole costs incurred by these groups as a result of the conservation mechanisms are indirect opportunity costs. The opportunity costs these communities would face as a result of any of the mechanisms include losses in potential:

- jobs from developments on the ejido and private properties (construction, tourism, hospitality, site maintenance);
- revenue from the increased demand for certain goods and services due to the influx of tourists and tourism workers into the area (souvenirs, restaurants, whale watching, transportation, fishing trips, etc.); and,
- infrastructure improvements established concomitantly to new developments (new roads, airport, communication lines etc.).

The main opportunity costs borne by the various levels of government are lost tax revenue opportunities and lost opportunities to meet the economic demands of their constituents.

The principal benefits for the local communities are the sustained (and potentially increased) quality of whale watching and other wildlife watching opportunities in the BMALC, sustained or enhanced ecosystem services, and the knowledge that biodiversity will continue to exist.

The main benefit of the conservation mechanisms to all levels of government is meeting their constituents' demands for biodiversity conservation. Additionally, the federal government would benefit from the positive reputation that these conservation efforts would bring in respect to their commitments under the Convention on Biological Diversity (particularly because these efforts are focused around a species that is a widely-known, charismatic, mega fauna).

5.8.1. Fee-simple Purchase

Fee-simple land purchase would result in close to no development on the private and ejido lands and therefore result in a large loss of indirect opportunity costs to local communities. Conversely, the conservation benefits to the local community would be the highest with this mechanism. There is not enough information about these costs and

benefits to determine precisely how they compare to one another. However, given: the strong need for increased economic opportunities in the BMALC; the communities' preferences for increased development (Sawatsky 2008); the fact that people are typically more sensitive to losses than to gains (Tom et al. 2007) - it is reasonable to conclude that the communities would (at least) perceive the opportunity costs from foregone development to be higher than the benefits they receive (particularly because a relatively low number of local community members are economically dependant on whale watching (Sawatsky 2008)).

The opportunity costs to the various levels of government are also higher for this approach than the other approaches. The local governments will be hardest hit by these opportunity costs due to the high percentage of their tax base that comes from communities within the BMLAC. The state government will suffer a relatively smaller impact (they have a larger tax base to draw upon) and the federal government would suffer the least impact (in relative terms). Benefits to the federal government would be highest, given the Mexican government's commitments under the Convention on Biological Diversity. The state government would benefit by further meeting the biodiversity conservation demands of its constituents; but, given the large percentage of lands in Baja California Sur that are under protected areas status, the state government is likely to value economic growth opportunities more than conservation opportunities. Evidence for this conclusion is provided by the state government's adverse reaction to the federal government's initiative to create a protected area in the BMALC (Gobierno de Baja California Sur 2008). Finally, the local government would value the enhanced (or sustained) opportunities for whale watching that the conservation mechanisms would provide; however, these opportunities are somewhat limited. The local government leaders are also in support of developments in the BMALC, but they would prefer developments that are sustainable (personal communication with PM, AEA, EDC, JU 2008).

5.8.2. Easement, Lease, Payments for Land Conservation and Ecotourism Agreement

Based on the level of development that each of the remaining mechanisms would allow leases would also result in fairly high indirect opportunity costs, easements with

somewhat less, payments for land conservation with less and ecotourism agreements with the least. Similarly, leases would result in high conservation benefits, easements with slightly lower benefits, payments for land conservation with even lower benefits and ecotourism agreements with the lowest.

Assuming that the costs to these stakeholders are much more significant than the benefits (valid given the arguments associated with fee-simple above), ecotourism agreements are likely to be the most equitable option, followed by payments for conservation, easement, leases and finally, fee-simple purchase.

5.9. Legitimacy

Legitimacy is the degree to which affected stakeholders are likely to accept the policy instrument as well as the degree to which to the policy instrument is appropriate to the values of society (Mickwitz 2003).

In most of the key informant interviews (all but two), the interviewees were receptive to the general idea of incentive-based conservation mechanisms in the BMALC (personal communication with EM, ER, AEA, EDC, PM, MAV, MD, JRV, GT 2008). However, many of the interviewees had varying opinions about which conservation mechanisms would work best for conservation and which ones would meet the needs of the local communities. Many of the key informants were concerned that the mechanisms would deny the local communities of future economic development opportunities.

All but two of the key informants interviewed were supportive of the concept of incentive-based conservation mechanisms in the BMALC. The two unsupportive interviewees were directly connected to the tourism industry at the state level; they were concerned about the impacts that the incentive-based mechanisms would have on prospective and future large-scale tourism developments in the BMALC.

During interviews with ejido members from two of the large ejidos around the BMALC, the interviewees expressed the view that leases were their preferred option. This was because it was a mechanism that they were familiar with, it provided them with a good level of assurance that they would receive the payments and they felt it would provide the conservation organization with certainty in achieving a high level of

conservation. Ecotourism agreements were the least preferred option because the ejidatarios did not feel that in-kind benefits would be as beneficial to the community as in-cash benefits. The ejido members did not like the permanency of easements; they did not want to bind future generations of their families with land use restrictions and they did not think that an upfront payment would be fair because of the restrictions placed on future generations. This opinion is congruent with documented experiences of easements in Mexico and Ecuador. As Sibileau et al. (2007) indicate, those establishing conservation easements on their land tend not to depend on their land to make a living.

Ejidatarios were open to the idea of payments for land conservation but they had concerns over the certainty of receiving the payments. The ejidatarios were also open to the idea of selling land for conservation (and have already started selling land to development investors), but they indicated that they preferred not to sell all of their lands. One group of ejidatarios expressed interest in selling some lands and leasing other land. They felt that lump sum of money earned through land purchase would provide them with the resources needed to initiate their own businesses (tourism and other).

Unfortunately, there was no opportunity to conduct interviews with private landowners around the BMALC. However, from the recent development proposals on lands that have been procured from ejidos by private landowners (Chapter 4), it is apparent that many of these landowners are intending to develop their lands for tourism.

The local communities and local and state governments had similar preferences to each other with respect to the different options. However the all of the options rate slightly lower under the state/local government preference criteria due to the general concerns that the state government had with incentive-based conservation mechanisms in the MBALC. The preferences of these stakeholders were deemed to be directly related to the limits that the mechanisms place on economic opportunities in the area. Therefore, fee-simple purchase rated the lowest, leases, easements, and payments for land conservation rated higher and ecotourism agreements rated the highest.

5.10. Costs to the ENGO

This section focuses on the costs (acquisition, transaction and management) to the ENGO, since it is the principal decision maker in this evaluation. Costs to other stakeholders and their distribution are discussed under the equity criterion.

5.10.1. Fee Simple Purchase

The acquisition costs for fee-simple purchase would be the highest of any of the approaches. Several real estate agents currently have listings for land around the BMALC. One agent has 135,000 acres of undeveloped coastal and inland ejido property listed for sale for \$162,000,000 USD (Lands End Realty 2008b). Another agent has listed 50 acres of coastal property for \$2,600,000 USD and another has 0.01 acres (4350 sq. feet) for sale for \$55,000 USD (Lands End Realty 2008a). Although these listed prices may not reflect the exact market value of the land (values from actual sales would provide a more accurate indication, but they were not possible to obtain), they do provide an idea of land values in the area. In interviews, several local community leaders indicated that the land prices vary from \$14,000 USD to \$40,000 USD per hectare (2.47 acres), depending on the location (i.e. coastal land is more valuable). These numbers reflect a large variation in sale prices. Although some landowners who have strong conservation values may be willing to donate lands or sell land for less than market value in order to preserve the conservation values of the land, Baja California Sur and Mexican policies do not support this approach. Mexico and the state of Baja California Sur lack tax incentive policies typically used by other countries to motivate land donors.²⁵ Furthermore, in the case of the first sale of parcelized ejido land it must be sold for at least the price established by a credit institution or the Commission of Valuations of National Property (Ley Agraria 1992, Art 86).. This makes it difficult for conservation-minded ejido members to sell the land at a reduced rate for the purposes of conservation.

²⁵ Mexico and the State of Baja California Sur do not provide income tax or transfer tax exemptions for the donations or bequests of lands for conservation purposes. However, in certain instances ENGO's have been successful in lobbying municipal tax authorities to exempt property taxes on conservation lands (Environmental Law Institute 2003).

There are various transaction costs associated with fee-simple purchase of private lands. One of these costs is the cost of negotiating the mechanism with current landowners. Fee-simple purchase would require negotiations with a large number of landowners and measures to convince ejidos to turn their lands into individual parcels of private property. As Boyd et al. (2000, pg. 214) indicate, "*Full-interest acquisitions are institutionally the simplest of conservation mechanisms ...requiring only a standard transfer of real estate ownership*". As such, the negotiation process for already privatized lands would require less effort and expertise than the other mechanisms, which call for relatively lengthy discussions about specific restrictions on the land and other contract terms. However, the negotiation costs for fee-simple purchase are increased by the fact that the ENGO would have to convince ejidos to parcelize their lands and then convince each ejido member to convert their land to private land tenure and sell it. While the other mechanisms also require complex negotiations, they do not require privatization of ejido lands and they are able to negotiate with the ejido as a whole instead of individual ejido members. As such the negotiation costs associated with fee-simple purchase are likely higher than those for the other approaches.

The other transaction costs that the ENGO will face include an acquisition tax, registry fee, public notary fee, appraisal fee, trust set up fee, legal fees (from hiring an attorney or lawyer to oversee or review the sale), land or building surveys, and title insurance. In Baja California Sur the acquisition tax is 2% of the sale value of a property (Ley de Hacienda Para el Municipio de Comondu del Estado de Baja California Sur 2001). The buyer is charged a registry fee of 0.25% of the property value, which is required to update the Public Records (Ley de Hacienda Para el Municipio de Comondu del Estado de Baja California Sur 2001). The Notary Public fee and property appraisal fee are both nominal (Ley de Hacienda Para el Municipio de Comondu del Estado de Baja California Sur 2001). Title insurance appears to be a one-time cost of 0.5% of the value of the land.²⁶ The land trust typically charges a fee equal to approximately 4% of the value of the property in the trust (Environmental Law Institute 2003). In total these costs add up to approximately 6.75% for the purchase price of the land.

²⁶ See: <http://www.topmexicorealestate.com/faq-closing-3.php#Q54> ; Retrieved January 2010.

Management costs for fee-simple would include the costs of: establishing and running a museum of natural history, monitoring the ecosystem, managing the land (including actively managing the land for conservation, enforcing the property rights through limiting trespassers, illegal dumping, illegal resource extraction etc.), the annual costs of maintaining the land trust and paying property taxes. Property insurance, aside from title insurance, is not usually purchased in Mexico and does not need to be taken into consideration. For parcelized ejido lands that have been transformed into private property and are immediately adjacent to the Zona Federal Maratime Terrestrial, there is a 5.2% property tax charged to every landowner subsequent to the first; the first being the ejidatario to whom the original private property right was granted. For other private property the tax rate is 0.31% for lands operated by their owner and 0.812% for lands not exploited by their owner (Ley de Hacienda Para el Municipio de Comondu del Estado de Baja California Sur 2001, Art. 6).

Conceivably there would be large economies of scale associated with the museum and enforcement costs, particularly when properties adjacent to one another are combined into one conservation area. Additional costs would include monitoring of the habitats and ecosystems on the land to ensure that land management practices are sufficient for protecting the ecosystem. While some authors argue that monitoring and enforcement costs are likely to be lower than the other approaches since the ENGO, as the sole landowner, is well positioned to ensure that there are no incompatible land uses on the property (Boyd et al. 2000), I argue that these costs would actually be somewhat higher because the ENGO is fully responsible for enforcing property rights, and actively managing the land.

5.10.2. Easements

Procurement of partial land rights through appurtenant easements can be done using the standard approach of paying for the easement at the outset, or by making regular periodic payments of a pre-determined amount. Although the first approach is more common in practice, there are examples of periodic payments for easements in Baja California Sur (as indicated in the Legality section). The Laguna San Ignacio

Conservation Alliance has secured an easement on Ejido Luis Echeverría's communal lands, for which the alliance makes annual payments of \$25,000 USD.²⁷

Although it is difficult to ascertain exact upfront acquisition costs for easements in the BMALC without an in-depth economic analysis, it is reasonable to say that these costs would be less than those for fee simple purchase. Boyd et al. (2000; *as cited in* Parkhurst and Shogren 2003) indicate that the fair market value for full upfront purchase of easements is generally 20% to 90% that of that for fee-simple acquisition. The cost of easements in the BMALC would be heavily dependent on the development and other land use restrictions included in the easement terms. The relatively high land values in Baja California Sur are due to the high tourist values and associated prospective development values of the area. As such, if the terms of the easement were to prohibit any type of tourism development, the easement would likely be quite expensive, but provide a higher level of protection on the land. If the terms were to allow for some minimal impact tourism development and other land uses, the costs of the easement would be lower. For the purposes of this analysis it will be assumed that the easement is structured to allow for some small-scale development on the land including small, low-impact ecotourism developments and some low-impact agricultural activities.

Periodic easement payments would evidently be much lower than a onetime upfront payment. It is likely that these costs would be somewhat higher than those of a lease or payment for land conservation, since an easement encumbers the land with permanent land-use restrictions. Perpetual provision of these payments would either require the establishment of an endowment fund, or consistent and continuous collection and transfer of funds from conservation beneficiaries (e.g. as indicated Chapter 1, per trip fee could be charged to whale watchers along the pacific coast of Canada, the USA and Mexico).

Easements are subject to the same acquisition tax (2%) and registry fee (0.25%) as fee-simple purchase (Ley de Hacienda Para el Municipio de Comondu del Estado de Baja California Sur 2001); they also require notarization. Ideally easements with

²⁷ As of 2005, the Laguna San Ignacio Conservation Alliance was also working to secure an easement on the parcelized ejido lands, which would entail a one-time payment of \$545,000, to be split evenly amongst the ejido members. See: <http://www.wildcoast.net/mznews/archives/000111.html> ; Retrieved January 2010.

standardized terms could be applied to all of the lands (with some adjustments for landowner preferences); this would keep negotiation costs fairly low. However, it is unlikely that a homogenized approach would attain sufficient interest from all landowners. As such, and due to the time requirements and legal fees associated with drawing up individual easement contracts, the negotiation costs associated with a conservation easement would probably be higher than those associated with fee-simple purchase (Parker 2004). Nevertheless, legal fees could be somewhat reduced by drawing from a related pre-existing contract, such as the contract used by the Laguna San Ignacio Conservation Alliance.

Land management costs would be relatively low. Under a typical conservation easement, land management tasks (preventing trespassing, illegal dumping, etc.) remain the responsibility of the landowner (Shaffer et al. 2002). However, the ENGO would be responsible for long term costs such as annual inspections, record keeping, and creating a contingency fund for costs associated with potential legal actions to enforce the easement (easement holders are generally liable for ensuring the terms of the easement are being upheld; this may not be the case in Baja California Sur, due to lack of legislation for conservation easements, but the ENGO would remain accountable to their funders). One of the significant costs associated with conservation easements is the requirement to communicate and enforce the land-use restrictions associated with the easement with subsequent landowners. This can cause particular problems when a new landowner has failed to complete a proper title search prior to purchasing a property. While a system of regular easement payments would continue to provide positive conservation incentives to new landowners, the payment level negotiated by the original landowner may not be sufficient to induce compliance from subsequent landowners. Legal costs associated with upholding these rights can be very significant, but these costs can be mitigated through the use of self-insurance (see Jay 2000 for a more detailed explanation).

Since they involve the purchase of usufruct rights, the easement holders would be required to pay property taxes on the value of the easement at the same rate as for fee-simple land purchase (Ley de Hacienda Para el Municipio de Comondu del Estado de Baja California Sur 2001).

5.10.3. Lease

The sole acquisition cost associated with the lease is rent. It is reasonable to assume that the yearly cost of rent is less than the cost of annual easement payments where the land-use restrictions imposed by both policies are similar. This assumption is based on the fact that leases only impose land-use restrictions for a limited period of time (i.e. they do not take away future opportunity costs from landowners), while easements impose 'permanent' restrictions (Main et al. 1999).

Transaction costs include the costs of negotiating the terms of the lease. These costs would be fairly similar to easement negotiation costs, but the limited contractual time period of the lease creates the necessity for further negotiations in subsequent lease periods. As such, from a negotiation standpoint, leases for conservation of lands around the BMALC would be considered more costly than easements.

Aside from property taxes, management costs would likely be similar to those for an easement. However, since a lease is not typically put into a trust, the ENGO would not have the same obligations to pursue costly legal enforcement of the lease if the contract is not abided by; furthermore since the ENGO has the ability to withhold lease payments if the terms of the lease are not being respected by the landowner, the contract is somewhat self-enforcing. However, according to article 2329 of the Baja California Sur civil code, the lessee is obliged to account for any property damage suffered by their fault or negligence or the fault or negligence of their families, workers or subtenants.

5.10.4. Payments for Land Conservation

Due to the ability for the landowner to withdraw from the agreement at any time, acquisition costs for payments for conservation would likely be less than those for an easement with annual payments or for a lease. However, this approach is also susceptible to the same temporal opportunism and 'incentive to actively seek external investment opportunities' problems as leases; thus without proper management of this issue, future payment values could actually end up being higher than those for easements with recurrent payments.

Negotiation costs for payments for land conservation would be relatively high; they would depend somewhat on the type of payment arrangement agreed to (i.e. how often payments have to be renegotiated - the more frequent the higher the cost). Furthermore, because the payments would be tied to the landowner, not the land, there would be a need to renegotiate every time the land was sold.

The ENGO's land management responsibilities and costs for payments for land conservation would be lower than for easements, but still significant. Monitoring would still be required, but enforcement costs would likely be low due to the fact that the ENGO can stop making payments if the terms of the agreement are not being met.

5.10.5. Ecotourism Agreement

Acquisition costs for a payment for an ecotourism agreement would vary depending on the structure of the agreement. There could potentially be some gains from trade (conservation organization able to provide training etc. directly from their organization), but at the same time the landowner might demand benefits to be larger where they are made in-kind rather than in cash because it could limit their business options (i.e. conservation organization is not likely to agree to make in-kind donations that are not in line with their conservation objectives). Overall there is a large amount of uncertainty regarding the costs for ecotourism agreements, but it is likely that acquisition costs would be less than those for easements since these agreements are less permanent than easements.

Negotiation costs would be high for ecotourism agreements for the same reasons that they would be for payments for land conservation. In addition, the complexities associated with communicating and developing an ecotourism agreement may also contribute to high negotiation costs.

As with payments for land conservation, the ecotourism agreement could be set up to be conditional, which would make enforcement costs relatively low (self-enforcing). Management costs would be similar to those for payments for land conservation, as the ENGO's land management responsibilities would be fairly low.

5.11. Summary of Results

The results of the multi-criteria analysis are provided in Table 6. Fee-simple purchase receives the highest number of stars overall (20.7 out of a possible 27), followed closely by leases (18.4), payments for land conservation (17.8), easements (17.4) and ecotourism agreements (15.3)²⁸.

With respect to legality, fee-simple purchase receives the highest rating because it is a tool that is well supported by the local state and federal laws. Easements receive a lower rating because the only legitimate type of easement that can be used in BSC was not intended for conservation use and there is some uncertainty over the courts' willingness to uphold it (although it has been used for conservation in other parts of Baja California Sur). Leases and payments for conservation receive a high rating because there are no discernable legal issues with their use. Ecotourism agreements receive the lowest rating because the weak contract right enforcement institutions in Mexico may make them difficult to enforce.

Fee-simple land purchase and leases are expected to result in the highest levels of protection; however, leases rate lower due to the slightly lower level of control over land use and management activities that they provide. The protection levels achieved by the other three mechanisms would depend on the terms negotiated, but it is likely that they would all allow for current land-use activities to continue and some additional low-impact developments and activities to occur and thus result in a slightly lower level of conservation than fee-simple purchase or leases.

²⁸ Totals are calculated on the basis of a maximum of 3 stars per criterion. Where there are two or more sub-criteria, the score for that criterion is calculated by adding up the number of stars under all the sub-criteria for a given criterion then dividing by the number of sub-criteria. For example, for fee-simple purchase, under the Costs to ENGO criterion the rating is calculated as (1 star + 2 stars + 1 star)/3 = 1.3 stars.

Table 6. Ratings of Each Mechanism Under Each Criterion

| Criteria | | Fee-Simple Purchase | Easement | Lease | Payments for Land Conservation | Ecotourism Agreement |
|--|--------------------------|---------------------|----------|-------|--------------------------------|----------------------|
| Legality | | ★★★★ | ★★ | ★★★★ | ★★★★ (n/a) | ★ |
| Level of Conservation | | ★★★★ | ★★ | ★★☆ | ★★ | ★★ |
| Persistence | | ★★★★ | ★★☆ | ★☆ | ★ | ★☆ |
| Flexibility | Management | ★★★★ | ★ | ★★☆ | ★★ | ★ |
| | Lands Conserved | ★★☆ | ★ | ★★ | ★★★★ | ★★ |
| Impact on Peripheral Conservation Incentives | Duty of Care | ★★★★ | ★★★★ | ★★ | ★ | ★ |
| | Temporal Opportunity | ★★★★ | ★★★★ | ★★ | ★ | ★★ |
| | Spatial Opportunity | ★ | ★ | ★★ | ★★★★ | ★★ |
| Costs to ENGO | Acquisition | ★ | ★★ | ★★ | ★★ | ★★ |
| | Transaction | ★★ | ★☆ | ★★ | ★ | ★ |
| | Management | ★ | ★★ | ★ | ★★ | ★★ |
| Equity | | ★ | ★★ | ★ | ★★ | ★★★★ |
| Transparency | | ★★★★ | ★★ | ★★☆ | ★★ | ★ |
| Legitimacy | Landowners (ejido only) | ★★ | ★ | ★★★★ | ★★ | ★ |
| | Local Communities | ★ | ★★ | ★☆ | ★★ | ★★★★ |
| | Local & State Government | ★ | ★★ | ★☆ | ★★ | ★★ |

★ represents a full star ☆ represents a half star

The ability for the ENGO to fully manage activities on the land and the relative ease of monitoring and enforcement make fee-simple purchase the most persistent

instrument. Easements are technically tied to the land in perpetuity, but difficulties regarding enforcement and monitoring make them less persistent than fee-simple purchase. Leases, payments for land conservation and ecotourism agreements all have similar monitoring and enforcement issues to easements. Leases can only be arranged for a maximum of 20 years and thus are a less persistent mechanism than easements. Ecotourism agreements are difficult to enforce due to Mexico's weak contract right enforcement institutions and thus have a similar persistence level to leases. Payments for land conservation are the least persistent mechanism due to the inability to enforce the agreement through legal means.

Land management flexibility is highest for fee-simple purchase because the ENGO owns the land and can control the activities on it. Leases also typically provide the ENGO with the control to change many land management activities, but management flexibility is lower because large changes may require negotiations with the landowner. Payments for land conservation are somewhat less flexible since they will generally need to be negotiated with the landowner. Finally, easements and ecotourism agreements rate the lowest in terms of management flexibility because changes to management decisions require negotiations, legal expertise and new legal contracts. Flexibility of lands conserved is related to the contract periods, the formality of contracts, and the ability to recoup investment costs; it is highest for payments for land conservation, followed by fee-simple purchase, leases and ecotourism agreements and finally conservation easements.

Spatial opportunism can impact landscape level conservation plans for fee-simple and conservation easement mechanisms (except for terminable easements). The impacts from this issue can be mitigated through most-favoured nation and unanimity clauses (can lead to higher than socially optimal acquisition costs), or landowner controlled special districts (requires legislative support). Temporal opportunism is an issue unique to mechanisms that have short-term contracts (leases, payments for land conservation and ecotourism agreements). The impacts from this issue can be mitigated if the ENGO maintains a reputation of never conceding to landowner demands at the inter-contracting stage

With respect to transparency, overall, fee-simple purchase rates the highest followed by leases, easements and payments for land conservation, and finally,

ecotourism agreements. This is because conservation outcomes and impacts of fee-simple purchase and leases are easier to measure, communicate and for stakeholders to understand. Ecotourism agreements promote land development; therefore, measuring and communicating their conservation impacts would likely be the most difficult.

The indirect opportunity costs to local communities and governments are largely a reflection of the development restrictions, and they are the main source of inequity for all of the mechanisms. As such, eco-tourism agreements are the most equitable, followed by payments for conservation, easements, leases and finally, fee-simple purchase.

With respect to legitimacy, key informants were generally supportive of the concept of incentive-based conservation mechanisms in the BMALC. Unsupportive interviewees were concerned about the impacts that the incentive-based mechanisms would have on prospective and future large-scale tourism developments in the BMALC. Ejido members interviewed preferred leases to all other conservation mechanisms. They were also open to fee-simple purchase and payments for land conservation, while easements and ecotourism agreements were their least preferred options. For the local communities and local and state governments fee-simple purchase was deemed as the least preferred, leases, easements, and payments for land conservation rated higher and ecotourism agreements rated the highest.

Given information constraints it was not possible to perform a rigorous analysis of the costs to the ENGO of the different mechanisms in an ex-ante evaluation. Acquisition costs are likely to be significantly higher for fee-simple purchase. Acquisition costs for easements, leases, payments for land conservation and ecotourism agreements can be lower, similar or higher than each other depending on the duration of the policy. However, for short and medium term projects leases are likely to cost less than easements, which in turn are likely to cost less than payments for conservation. There is a large amount of uncertainty regarding the costs for ecotourism agreements, but it is likely that acquisition costs would be less than those for easements since these agreements are less permanent. Transaction costs of the various approaches are a reflection of the legal and time costs of negotiating with the landowner. Leases rate the highest in this regard, followed by easements, payments for land conservation and

ecotourism agreements, and finally fee-simple purchase, which rate the lowest due to the requirement to convince ejidos to parcelize and privatize their lands. Management costs are mainly related to the level of responsibility the ENGO has for the management of the lands. They would be highest for fee-simple purchase, followed by leases, easements, and payments for land conservation/ecotourism.

Chapter 6.

Discussion

Completion of the DPSIR framework highlights whether some of the key factors for success of incentive-based conservation mechanisms (as highlighted in Chapter 2) are present on the private and ejido lands in the BMALC. First, well-defined and secure property rights are one of the most commonly cited factors for success pointed to in the literature (Swallow et al. 2007; Ferraro & Gjersten 2009; Milne & Niesten 2009; Neef & Thomas 2009; Dougoulii et al. 2012; Wunder 2013; amongst others). The property rights in the BMALC, although in the midst of changing for the ejido lands, are well defined and, from a preliminary assessment, appear to be relatively secure. Second, a supportive regulatory regime is an important factor noted by Swift et al. (2004), Poats (2007), Swallow et al. (2007), and Neef & Thomas (2013). While there are no laws explicitly governing incentive-based conservation mechanisms in Mexico and Baja California Sur, the regulatory framework does not impair the use of any of these mechanisms, and they have been used by the government(s) and NGOs with success in various areas of the country. Furthermore, the current situation on the private and ejido land surrounding the BMALC also seems to align with one of Wunder (2007's) main conclusions with respect to success of incentive based conservation mechanisms: while there have been large scale development proposals on the private and ejido lands of the BMALC in the past, none of the proposals have gone through to date, thus the opportunity costs in these areas could still be relatively moderate and the threat is still impending and not yet in place. Finally, Swallow et al. (2007), point to the public attitudes of the current regulatory regime to protect the environment as an important factor for success (people will view incentive-based mechanisms (PES in the case of Swallow et al.'s study) as an important alternative). While this was not an explicit question in the key informant interviews, several of the interviewees, particularly NGO leaders and local community leaders or groups in the BMALC brought up their

frustration, dissatisfaction and distrust regarding the current law, their sufficiency and/or the sufficiency of their implementation (lack of enforcement/resources/political will) to protect the environment.

Some of the factors for success pointed to in the literature to date were not touched on in the DPSIR (e.g. high level of trust between the buyer and seller of the conservation good (Neef & Thomas 2009; Wunder 2013)). Furthermore, it is recognized that not all of these factors are well understood. As more empirical data on incentive-based mechanisms is collected and analysed in the literature (as called for by Brouwer et al. 2011; Ferraro 2011; Pattanayak et al. 2010), it will allow for a more comprehensive set of factors for success to be developed. However, regardless of the developments of those studies, there will always be a need to examine and adapt policies to the local circumstances.

The DPSIR provides an understanding of some of the local circumstances, but it is not completely comprehensive. With additional time and funding further interviews could be undertaken to provide a deeper understanding of the complex economic, social, cultural, biological and political aspects related to the conservation of the private and ejido lands. For instance, although the property rights review suggests that the property rights are fairly well defined, and in interviews with key informants, the property rights on the ejido and private lands seemed to be fairly clear (on federal lands with concessions the interviews revealed that there was more debate, and the local peoples had a different view than the government), further interviews with community members and ejidatarios may have revealed conflicts that did not come up in the interviews I conducted. Nevertheless, the DPSIR as completed in this project provides some understanding of the complex situation, and it indicates that the presence of at least some of the factors for success pointed to in the literature are present in the BMALC. This is an important indicator that these mechanisms have the potential to be successful for the private and ejido lands in the BMALC. Furthermore, the DPSIR helps indicate which policy mechanisms are suitable for the ejido and private lands in the BMALC and allows for a narrowing of options brought forward into the multi-criteria analysis.

Based on the findings of the multi-criteria analysis, no one single mechanism clearly stands out as being optimal for conservation of the private and ejido lands in the BMALC. Different mechanisms have different strengths and weaknesses, as indicated in

the summary table. Although fee-simple purchase receives the most stars overall, weights have not been applied to the criteria (it was deemed inappropriate to provide weights in the evaluation as this is a highly subjective exercise that is better left up to the organization or group responsible for policy implementation). Depending on the weights given to the various criteria there is the potential that different policies could be deemed as optimal.

While the nature of some of the criteria leads to a clear rating of mechanisms, for others it is recognized that there is some ambiguity, or even a potential change in the ratings if certain assumptions are relaxed or changed. Furthermore, it is recognized that some of the factors that play into how well an option rates under each of the criteria cannot be foreseen. For example, it was not possible to complete an ex-ante assessment of the costs associated with each mechanism; this would require extensive surveys, interviews and analysis, the level of which were outside the scope of this project. Even with more information, it is doubtful that a full understanding of the costs of any one of the methods could be achieved until the mechanism was implemented and in operation for some time. It is for this reason that it was decided that star ratings using the Borda method were appropriate. These allow for a picture of the strengths and weaknesses of the approaches to be synthesized, but does not suggest a definitive score or outcome.

Additionally, since incentive-based approaches are still in their infancy in Mexico, there are not a large number of locally based projects that have been evaluated in the literature. As information comes out of evaluation from these projects it will be important to adapt and learn from their success and failures.

While the criteria used in the multi-criteria analysis are quite comprehensive, it is recognized that they are not completely exhaustive and there may be other criteria that could prove important in time (e.g. cultural impacts). However, from the information collected in the key informant interviews and from studying the literature it is thought that the criteria used in this evaluation are the most relevant for the situation.

Regardless of the type of mechanism, there are a variety of insights from the literature and from the multi-criteria analysis that could be used to help ensure that the mechanism is successful. First, the goals and objectives should be clear and followed (Missrie & Nelson 2005) and conservation should be kept as the priority goal (Wunder et

al. 2008, as cited in Pattanayak et al. 2010). Where the mechanism allows for it, payments/benefits should be linked as closely as possible to the conservation outcome (Ferraro & Gjertsen 2009). Second, It is important that transaction costs be kept low; joining landowners in bundled groups is one approach that could help reduce these costs (Wunder 2013; Pagiola & Platais 2002). Third, both trust between the buyer and seller and trust of the mechanism itself are important for the success of the policies (Swallow et al. 2007; Neef & Thomas 2009; Wunder 2013). Time should be spent at the outset building relationships and communicating the mechanism. Fourth, local support and participation in the design and implementation of the mechanism is important (Missrie & Nelson 2005; Neef & Thomas 2009). Efforts should be made to involve local communities throughout. Fifth, persistence of the mechanism can be bolstered when several ENGOs enter into the arrangement together as buyers through an alliance. Sixth, mechanisms designed with a recurrent supply of payments or other benefits may promote self-enforcement of the mechanism and diminish the need for legal enforceability. Seventh, differentiated payments can help increase incentives for sellers to conserve. Furthermore, the ability for the ENGO to adjust its payment levels in subsequent contracting periods is important for conditionality and the persistence of leases, payments for land conservation and ecotourism agreements. The importance of conditionality is highlighted by Southgate & Wunder (2009), Wunder (2007), Neef & Thomas (2009). Eighth, equity issues can be reduced if the ENGO also provides local communities and government with incentives that are commensurate to the opportunity costs that these stakeholders face. Ninth, it should be recognized that incentive-based mechanisms have little impact on duty of care; as such, they should be used for initial increases in conservation standards in any one area, and then be followed by regulatory standards. Finally, since none of the conservation mechanisms, aside from fee-simple purchase, are explicitly recognized by law, it is important that additional support, such as written approval and support by various government agencies, be sought to help ensure their validity.

Others have completed general comparisons on the legality of various approaches, and the costs associated with several of the mechanisms (Swift et al. 2004). In addition, there are case studies of how particular tools have worked in certain situations (see Ch 2 for examples). This project has attempted to bring the two of these approaches together in a relatively comprehensive ex-ante evaluation. To date I have

not been able to find such an evaluation in the literature. It is the hope that this project will be used to better inform conservation practitioners of the pros and cons of the various options for conservation of these lands in the BMALC. Furthermore, the approach could be used in other scenarios to help ensure that policy makers and conservation practitioners are taking into account all of the appropriate considerations when evaluating policy options and moving forward on conservation strategies.

Chapter 7.

Conclusion

The DPSIR framework for the ejido and private lands in the BMALC reveals that several of the key factors for success for incentive-based conservation mechanisms highlighted in the literature review are present. Specifically, property rights are relatively well established and secure, and there is general support for the use of incentive-based conservation mechanism in Baja California Sur (as evidenced by their use in other parts of Mexico), even though their use is not explicitly sanctioned by the regulatory framework. In addition, the DPSIR framework demonstrates that these mechanisms fill a key policy gap for the ejido and private lands in that they help address the strong forces driving tourism development in the area. Finally, the framework reveals five potentially appropriate mechanisms for these lands: fee-simple purchase, easements, leases, payments for land conservation, and ecotourism agreements.

A detailed ex-ante multi-criteria analysis of these five mechanisms shows that there are strengths and weaknesses associated with each one. In regards to total score, fee-simple purchase ranks the highest, followed closely by leases, payments for land conservation, easements and finally, ecotourism agreements. The total score provides some indication of the optimality of the various mechanisms for the local situation; however, these scores should be regarded with caution. Weighting the criteria could change these results, and weights were not incorporated into the analysis (this was to allow clearer more-easily communicable results and because there would have been much ambiguity and subjectivity in the weighting).

Fee-simple purchase, leases and payments for land conservation receive the highest ratings for legality. Fee-simple purchase receives the highest rating for level of conservation, persistence, transparency and flexibility in land management. Payments for land conservation receive the highest rating for the flexibility of lands conserved and

the impact on spatial opportunism. Fee-simple-purchase and easements receive the highest ratings for impact on duty of care and impact on temporal opportunism. Ecotourism agreements receive the highest rating for equity and legitimacy in local communities. None of the mechanisms rate high with respect to acquisition, transaction and management costs; however, fee-simple purchase receives the lowest rating for acquisition cost, payments for land conservation and ecotourism agreements receive the lowest rating for transaction costs, and fee-simple purchase and leases receive the lowest rating for management costs. Furthermore, none of the mechanisms rate high with respect to legitimacy in the local and state governments, but fee-simple purchase rates the lowest.

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Appendix A.

Property Rights Assessment

Property Rights in the BMALC

As indicated in chapter 2, secure and well-defined property rights are important foundations for any incentive-based conservation mechanism. Furthermore, understanding these rights is important for putting the Driving-Forces Pressure State Impact Response model described in Chapter 4 into context, as the property right structure and recent changes to that structure inform some of the key driving forces. The property rights on land surrounding the Bahía Magdalena Almejas Lagoon Complex (BMALC) fall into five main categories: private property, ejido land, municipal land, federal land and concessions. Excluding the small parcels of municipal land, the federal government and five ejidos have traditionally held the full ownership rights to land around the bay. However, as described in more detail below, relatively recent changes in legislation have enabled private individuals and groups to purchase sizeable tracts of land in the BMALC.

Municipal Land (Urban Centres)

As indicated in Chapter 1, there are six principal towns surrounding the BMALC: Puerto San Carlos, Puerto Adolfo Lopez Mateos, Puerto Magdalena, Puerto Cortes, Puerto Alcatraz and Puerto Chale. Only two of these towns are located along the mainland coast: Puerto San Carlos and Puerto Adolfo Lopez Mateos. The other three towns are located on islands that are considered federal lands and they are classified as concessions.

Most of the long-term residents in the BMALC are descendants of former rancheros from the Santo Domingo valley. Beginning in the 1920s, crop failures led agricultural workers to seek new means of subsistence (Garcia Martinez 2005). The abundance of marine resource in the BMALC made it an attractive place to settle. By the 1950's the opening of fish canneries and commencement of a deep-water port project brought greater economic gains, and thus workers, to the area (Bird et al. 2001). During the last several decades Puerto San Carlos and the other towns in the BMALC have undergone extensive changes due to declining fish stocks. However, as of 2006, the primary source of income in Puerto San Carlos and Puerto Adolfo Lopez Mateos was small-scale fishing (Hastings and Fisher 2001; Sawatsky 2008). Other important sources of income, in order of importance, were small-scale fishing, fish processing, other commerce and services, government employment, construction and transportation, tourism and industrial fishing (Sawatsky 2008).

Federal Land

Article 48 of the Mexican Constitution states that the federal government shall have jurisdiction over all of the islands and islets except those islands that have previously been placed under state jurisdiction (Constitución Política de los Estados Unidos Mexicanos 1917). According to the Article 34 of the Constitution of the State of Baja

California Sur, Margarita Island and Magdalena Island are under state jurisdiction (Constitucion Politica del Estado de California Sur 1992). However, a publication issued by the Legislature in the House of Parliament explains that despite some confusion the islands are actually legally under federal jurisdiction (Cabada Huerta).

Furthermore, according to Articles 7 to 9 and 119 of the General Law of National Property (Ley General de Bienes Nacionales 2004) and Articles 3 to 5 of the Regulations for the use of the Territorial Sea, Navigatable Waterways, Beaches, Federal Terrestrial Maritime Zone and Land Gained by the Sea (Reglamento Para el Uso y Aprovechamiento del Mar Territorial, Vías Navegables, Playas, Zona Federal Maritime Terrestre y Terrenos Ganados al Mar 1991), the federal government has jurisdiction over (1) the territorial sea, (2) the intertidal zones of coastal beaches, (3) ports, bays and coves, and (4) maritime land (generally defined as a strip of land that stretches all along the coast and which extends from the mean high tide line to 20 meters inland). Although all of these zones are under federal jurisdiction, they are legislated for common use. The public may use this property without restrictions other than those established by Mexico's administrative laws and regulations. Furthermore, special uses of these properties require an authorized concession and must adhere to the conditions and requirements established in the laws.

Concessions (only on federal land)

In the BMALC complex there are many fishery concessions held by cooperatives, ejidos and other groups. The largest concessions are Puerto Magdalena (68 households and 259 individuals), which is located on Isla Magdalena, Puerto Alcatraz (54 households and 199 individuals) and Puerto Cortes (34 households and 134 individuals), which are located on Isla Santa Margarita and Puerto Chale (373 individuals), which is located on the mainland coast in Bahía Almejas (Instituto Nacional de Estadística y Geografía 2005, 2010). Although, the concessions are technically impermanent,²⁹ in interviews with fishery concession holders in the BMALC, I found that many fishers holding concessions for extended periods of time felt that they had significant de facto rights and title to the land that their concession was associated with, even those rights were not formalized (personal communication with MAV 2008). This feeling was particularly strong in Puerto Magdalena where many concession holders have lived and worked on and around the island for their entire lives. Although the concession holders in Puerto Magdalena are trying to get legal rights and title to the land, it is thus far unclear whether the federal government is willing to relinquish those rights.

Ejido and Private Land³⁰

Before the Mexican Revolution of 1910 most arable land in Mexico was controlled by a small number of large haciendas (Thompson and Wilson 1994). Part of the intention of the Mexican Constitution of 1917 was to create mechanisms for land to be redistributed

²⁹ According to article 73 of the General Law of National Property concessions can be issued for a maximum of 50 years, after which they must be renewed (Ley General de Bienes Nacionales 2004).

³⁰ For clarity, private lands in this paper do not include private properties in the urban centres.

from large landholders to landless labourers (Brown 2004). Article 27 of the Constitution enabled groups of at least 20 landless farmers to petition the federal government to expropriate property from large landholders to create plots of communally held land (ejidos). Despite the creation of this new form of land tenure, it was not until during the presidency of Lázaro Cárdenas (1934 to 1940) that significant quantities of land were redistributed to peasants in the form of ejidos (Cartron 2005, pg 55). By the early 1990's more than half of the arable land in Mexico (>55%) was held by ejidos (Jones 1991). Although the ownership rights to the land remained with the government, ejido members were given the rights to farm and otherwise use their lands; they were also able to bequeath their rights but they could not rent or sell the land. Furthermore, ejido members would lose their rights to the land if they left it idle for more than 2 years.³¹ Although individual ejido members were often allocated small parcels within the ejido, the majority of the land was held as commons. As of 1988, less than 1 percent of ejido land in Baja California Sur was held in parcels (Thompson & Wilson 1994).

In 1992, Article 27 of the Constitution and the Mexican Agrarian law were both amended and ejidos were given the right to award individual land titles to their members. In addition, land use was no longer a requirement for retaining ownership rights (Jones & Ward 1998). These amendments have had several significant consequences:

- Mexican land is now prohibited from being redistributed through expropriation, except for the purposed of public utility considerations and through compensation;
- Individual lots, of a maximum of 5% of the size of the entire ejido, can be allotted to individual ejido members and converted to private property (dominio pleno), provided that 2/3 of the ejido members in attendance vote in favour of the conversion at an assembly where at least ¾ of the members of the ejido are present;
- According to article 79 of the Agrarian law, use or usufruct of parcelized communal lands (that have not been converted to private property) can be granted to third parties by means of shared tenancy, partnership, lease or any other means not prohibited by the law (does not require authorization by the ejido assembly or any other authority);
- Foreign persons and corporations can own land within Mexico, except for land within the 100km restricted zone adjacent to international borders (100km) and the 50km restricted zone along the coast.

These amendments have resulted in recent changes of land tenure in the BMALC. There are 5 different ejidos located on the coast of the BMALC. As figure 3 in Chapter 4 illustrates, Ejido Ley de Agua Federal 5 (Ejido 5) and Ejido San Juan de Matancitas (Ejido Matancitas) own the majority of the coastal property. Ejido 5 has approximately 340 inhabitants and 78 ejido members and Ejido Matancitas has 81 ejido members (personal interviews). As figure 3 also shows, Ejido NCPE Ley Federal de Agua No. 5 has already parceled most of its coastal land. Furthermore, in my conversations with local ejido members it was clear that at least 1/3 of this parceled land has been sold to

³¹ This had negative implications for conservation because conservation was not a recognized use of the land.

external investors in recent years and many other attractive offers have been placed. Other ejidos, such as Matancitas, Santo Domingo, Ley Federal de Aguas 5 and Ley Federal de Aguas 4 still hold the majority of their land as commons and despite recent offers they have not yet sold significant portions of it (personal interviews 2008; International Community Foundation 2006). As of 2004 there were no issues with land title for the ejidos, with the exception of one ejido, which was having land title disputes with the Federal Electricity Commission for 16.4 ha of their land, and another ejido that had several people squatting on their lands and demanding 20,000 hectares (International Community Foundation 2006).

Traditionally, the ejidos in BMALC have used their land for farming (alfalfa, wheat and maize) and ranching (mainly dairy cattle) and the coastlines for fishing. Some of the ejidos have started aquaculture projects on their land, and one has a large salt mine (2000 ha) of which only 1 or 2 hectares was actively mined as of 2004 (International Community Foundation 2006). Many of the private investors purchasing tracts of land are interested in tourism development, while some have purchased lands for shrimp farms (personal interviews; Whitmore et al. 2005; Dedina 2002; International Community Foundation 2006). Within the ejidos the main sources of income are ranching, agriculture, fishing and aquaculture (personal interviews; International Community Foundation 2006).

Appendix B.

Legislative Review

Current Legislation

The Mexican Constitution (Constitución Política de los Estados Unidos Mexicanos 1917) is what gives Congress of the Union (Congreso del Union) the power to create laws, including laws pertaining to environmental conservation and protection. Article 4 of the Constitution states,

Toda persona tiene derecho a un medio ambiente sano para su desarrollo y bienestar. El Estado garantizará el respeto a este derecho. El daño y deterioro ambiental generará responsabilidad para quien lo provoque en términos de lo dispuesto por la ley.

(Translation: Everyone has the right to a healthy environment for his or her development and welfare. The State shall ensure that this right is respected. Environmental deterioration and damage generates responsibility for those that cause it under provisions of the law.)

Furthermore, Article 73, paragraph XXIX-G, gives congress the power to enact laws that ensure that the federal, state and municipal governments are in agreement when acting in their respective jurisdictions on the subjects of environmental protection and preservation and restoration of the country's ecological balance. Finally, Article 27 requires that all necessary laws be enacted to preserve and restore the country's ecological balance.

According to Catron (2005, pg. 87), "the General Law for Ecological Balance and the Protection of the Environment (Ley General del Equilibrio Ecológico y la Protección al Ambiente (LEEGPA 1988) is the most important piece of environmental legislation ever enacted in Mexico". Articles 5 to 8 of the LEEGPA clearly outline the jurisdiction afforded to the federal, state and municipal governments in ecological and environmental matters. The following sections outline these jurisdictions as well as the main laws and policies of each level of government as they pertaining to conservation in the BMALC.

Federal Legislation

The federal government is in charge of the creation and enforcement of the general national environmental policy and legislative programs for terrestrial and marine ecosystems. It is responsible creation and management of federal natural protected areas including biosphere reserves, national parks, natural monuments, natural resource protection areas and flora and fauna protection areas. Furthermore, the federal government is responsible for the regulation for the sustainable use, protection and preservation of many natural resources including natural waters, biodiversity, flora and fauna. Finally, and what has been stated to be the most important tool the federal governmental has for protection of wildlife and ecosystems in the BMALC (personal interviews), the federal government is mandated to review, evaluate and approve or deny environmental impact assessments including, but not limited to, those for:

- developments that effect coastal ecosystems;
- works and activities in wetlands, lagoons, mangroves, estuaries and lakes connected to the sea;
- fishing or fish farm activities that can put the preservation of one or more species in danger or cause damage to ecosystems; and
- hydraulic projects.

(LGEEPA 1988, Art. 28)

The LGEEPA, which is the responsibility of the Secretariat of the Environment and Natural Resources (SEMARNAT), also establishes several instruments with which to ensure its general goals of environmental protection and sustainable development are met. These instruments include ecological zoning, environmental impact assessments, protected areas and Mexican Official Norms (Normas Oficiales Mexicanas -NOMs).

The LGEEPA enables the creation of Marine Ecological Zoning and Ecological Land Zoning at the national, regional and local levels. Ecological Zoning has the potential to be an effective instrument for biodiversity protection in BMALC because of the restrictions it creates on the uses of land and marine areas. However, in Baja California Sur only one Marine Ecological Zoning Plan has been created so far and it only covers the Gulf of California. Moreover, as of September 2013 Baja California Sur did not have any regional Ecological Zoning Plans and the only established local Ecological Zoning Plan was for the municipality of Los Cabos.³² Thus, although an important instrument, ecological zoning does not currently provide any protection to ecosystems in the BMALC.

Another instrument for created by the LGEEPA for environmental protection is the environmental impact assessment. As substantiated earlier, the federal government is responsible for reviewing, assessing and authorizing environmental impacts for any developments or works in the BMALC. Upon receipt of an environmental impact statement the government has 60 days within which to review the statement and issue a resolution. During that time people from communities affected by the proposed activity or development may request a public inquiry, and issue comments. These comments must be taken into consideration in the final decision of the reviewing body (Catron, 2005). So far in the BMALC at least two major development projects have been stopped, in part, due to the environmental impact assessment process (personal interviews).

Articles 44 to 77 of the LGEEPA create the necessary legislation for the development of Natural Protected Areas. Once an area has been established as protected there are much more stringent restrictions on what activities can take place in the area (e.g. in the nucleus of natural protected areas is prohibited to perform any type of activity that introduces any contaminants to the area). Additionally, a management plan must be created and implemented in the area. The National Commission of Natural Protected Areas (Comisión Nacional para el Conocimiento y Uso de la Biodiversidad) and several

³² See: <http://www.semarnat.gob.mx/temas/ordenamientoecologico/Paginas/ODecretados.aspx>

NGOs have pushed to place Bahía Magdalena under protection as a biosphere reserve, but this reserve is only planned to protect the islands and the water, not the coastal mainland (“Excluye decreto a Bahía Magdalena” 2009). As such Puerto San Carlos, Puerto Adolfo Lopez Mateos and the private and ejido lands along the coast would not receive any the added protection and conservation funding associated with this tool (Pronatura-noroeste 2006).

The final set of tools under the LGEEPA is the NOMs. NOMs set the requirements, specifications, procedures and limits that need to be observed for particular activities. For example, NOM-001-SEMARNAT-1996 establishes the maximum limits for contaminants for wastewater discharges in national water or property. There are many NOMs that directly and/or indirectly apply to conservation in the BMALC, but the most significant ones are:

- NOM-059-SEMARNAT-2010 establishes environmental protection for native, wild flora and fauna species of Mexico. It creates risk categories and specifications for the inclusion, exclusion or change in status of species under these categories. In the BMALC, the gray whale is listed as a species subject to special protection. The East Pacific green, Pacific loggerhead, hawksbill and olive ridley sea turtles are all listed as species in danger of extinction. Species included in these lists are given increased conservation priority by the government of Mexico.
- NOM-022-SEMARNAT-2003 establishes specifications for the preservation, conservation, sustainable use and restoration of coastal wetlands in mangrove zones. This law is directly linked to the BMALC because of the extensive mangrove forests located along the shoreline. This NOM prohibits the establishment of any fixed marine infrastructure or any other project that takes land from the hydrological unit of mangrove zones, except when the project has the objective of maintaining or restoring the hydrological unit.
- NOM-131-SEMARNAT-2010 establishes the attributes and specifications for the development of whale-watching activities, relative to their protection and the protection of their habitat. The law establishes restrictions on the size of whale watching boats and the distance that they need to remain away from the whales. It also mandates the publication of an annual announcement that specifies the number of boats allowed permitted to partake in whale watching activities, the duration of the whale watching season and defined whale watching exclusion zones in each of the gray-whale birthing and calving lagoons in Baja California Sur.
- NOM-162-SEMARNAT-2012 protects the nesting habitat of sea turtles. It restricts activities such as the removal of vegetation and other disturbances (lighting, etc.) in the nesting habitats. Furthermore, it regulates the management of sea turtles and their habitat by authorized people and organizations.

In addition to the NOM's the federal government also declared a complete ban on sea turtle capture and harvest in 1990 (Diario Oficial de la Federación 1990).

The other important federal laws pertaining to conservation in the BMALC are the Federal Environmental Responsibility Law (Ley Federal de Responsabilidad Ambiental 2013), the General Wildlife Law (Ley General de Vida Silvestre 2000), the Sustainable Fisheries and Aquaculture Law (Ley de Pesca y Acuicultura Sustentables 2007) and the National Waters Law (Ley de Agua Nacionales 1992). The Federal Environmental

Responsibility Law was very recently enacted (June 2013) and it relates back to Mexican citizens' rights to a healthy environment, as outlined in Article 4 of the Mexican Constitution (see the beginning of this section). This law regulates the environmental liability that arises from damage to the environment as well as the repair and compensation for such damage. Under this law environmental damage is considered independent of the property damages incurred by property and natural resource owners; rather it is a loss, change, deterioration, impairment or measurable adverse modification of habitat, ecosystems, natural resources and elements, their conditions chemical, physical or biological interaction relationships that exist between them, as well as environmental services they provide (except where the activity is authorized by SEMARNAT or it is within the limits set out by applicable laws or NOMs). The Federal Environmental Responsibility Law (2013) also creates an Environmental Responsibility Fund, which aims to pay for the repair of environmental damages when it is required for urgent or important reasons.

The General Wildlife Law promotes the sustainable exploitation of wildlife and the conservation of wildlife that is at risk (Ley General de Vida Silvestre 2000). Articles 63 to 65 of the law give SEMARNAT the ability to declare particular areas as critical habitats for the conservation of wildlife. Subsequent to this declaration SEMARNAT may create agreements with landholders for special conservation and management measures in these areas and/or establish them as conservation reserves (Ley General de Vida Silvestre 2000). Unfortunately, thus far, no such arrangement has been created for any part of the BMALC.

Forest and fish exploitation are exempt from the General Wildlife Law except where there are species at risk. Fish exploitation is instead regulated through the Sustainable Fisheries and Aquaculture Law. The Sustainable Fisheries and Aquaculture Law requires that special permission in the form of a permit, concession or authorization, be obtained for the exploitation of any fish resources (Ley de Pesca y Acuicultura Sustentables 2007). The Secretary of Agriculture, Ranching, Rural Development, Fishing and Food (Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación – SAGARPA) is in charge of issuing these permissions and may revoke them at any time if the permit holder damages or puts at imminent risk the ecosystem in which they are conducting their activities. SAGARPA also has the authority to establish fishery reserves or refuge zones and/or place bans to protect threatened or endangered species. Furthermore, SAGARPA may regulate the equipment and techniques used for fishing practices. Fishing is currently the largest economic activity for the residents of the BMALC. Unfortunately, despite the permitting and concession system that is in place, many species are overexploited in the area. As Catron (2005) states, "SAGARPA appears to be granting fishing permit and concessions without any restrictions and supervision" (pg. 99). In addition, during my discussions with local fisherpeople it was evident that despite increases in fishing effort, catch has significantly depleted in the past several years.

Finally, the National Waters Law (1992) regulates wastewater discharge and dumping in all marine areas (Ley de Agua Nacionales 1992). Articles 20 to 27 of the law specify the necessity to obtain a permit for any dumping into the ocean (there are exceptions in special circumstances). Discharges from municipalities and rural areas are more specifically regulated under NOM-001-SEMARNAT-1996 and NOM-002-SEMARNAT-1996.

State Legislation

At the state level environmental laws are created through articles 18 and 79 of the Constitution of Baja California Sur (Constitución Política del Estado Libre y Soberano de Baja California Sur 1975). Article 18 gives all of the inhabitants of the state the right to health and social security protection, including a clean environment. Furthermore, article 79, paragraph XLIII gives the governor the responsibility to promote and ensure a clean environment and to perform the actions necessary to ensure the preservation of the ecological balance of the state.

With respect to wildlife conservation in the BMALC, the state has jurisdiction over the creation and implementation of a state environmental policy; the establishment and administration of state natural protected areas; the formulation, issuing and execution of general, regional local and marine programs; and oversight for compliance with NOMs. The state government's power is greatly limited in comparison with the federal government's, especially given the property rights structure around the BMALC. Nonetheless, state environmental laws will be touched on because they play a role in protecting the non-coastal ejido section of land surrounding the BMALC.

The main piece of environmental legislation covering conservation in Baja California Sur is the Law for Ecological balance and Environmental Protection of the state of Baja California Sur (Ley de Equilibrio Ecológico y Protección del Ambiente del Estado de Baja California Sur – LEEPABCS 1991). The LEEPABCS allows for the state government to create urban zoning plans (which may include the Ecological Zoning Plans discussed with LGEEPA). These plans have the potential to be effective for environmental conservation because they can create restrictions on the permissible uses of land. Although none have been established in the BMALC, natural protected areas may be created through these urban zoning plans. The LEEPABCS also covers general legislation for the protection of the soil, water and air under state jurisdiction from contaminants and pollutants. Failure to abide by the laws in the LEEPABCS results in severe criminal sanctions (3 months to 5 years in prison and 200 to 500 days of salary in fines) laid out in Articles 230 and 231 of BCS's Penal Code (Código Penal para el Estado de Baja California Sur 2005).

International Treaties

Article 133 of the Mexican Constitution states, "the supreme laws of the union are the provisions contained in the Mexican Constitution, the law of Congress emanating from the Constitution, and the international treaties signed by the President and ratified by the Senate" (Constitución Política de los Estados Unidos Mexicanos 1917). Once ratified by a simple majority in the Senate, international treaties become part of Mexico's domestic laws." (Paisley et al. 2004). Although these laws will not be examined in great detail here, it is important to note that Mexico has signed the International Convention for the Regulation of Whaling (1946), the Convention on Biological Diversity and the Convention (1993) on International Trade in Endangered Species of Wild Fauna and Flora (1973).