EVALUATING ECOTOURISM IN MEXICO'S BIOSPHERE RESERVES –
WHALE WATCHING ACTIVITIES IN THE WORLD HERITAGE SITE OF LAGUNA SAN
IGNACIO, BAJA CALIFORNIA SUR, MEXICO 1994-2002

by

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Abstract

A descriptive case study approach and 34 indicators was used to examine the socio-economic impacts of whale watching tourism in the Laguna San Ignacio (LSI) World Heritage Site - located within the El Vizcaino Biosphere Reserve in Baja California Sur, Mexico. The framework measured both the socio-economic changes, and the economic viability of the local and regional operators. This approach led to a detailed understanding of the underlying, and often complex, inter-related factors that shaped the ecotourism development in LSI between 1994 and 2002. It identified strengths and weaknesses of current ecotourism development making it a valid tool for evaluating and improving these activities in any biosphere reserve. More specifically the objectives were to examine:

1. How existing ecotourism operations and their activities in the LSI have changed since 1994;
2. Whether these changes have made ecotourism a more viable socio-economic development alternative for the local communities; and
3. Which strategies may be useful in overcoming identified barriers to further socio-economic benefits both from existing and future ecotourism activities

The results strongly suggested that the benefits from ecotourism improved significantly between 1994 and 2002. Economically this was reflected in growth of visitor numbers (50%), employment (100%) and local and regional revenue approximately 70% (or 55% in real terms adjusting for inflation). Social benefits were seen in more cooperation among previous antagonistic stakeholders; a wider distribution of ecotourism benefits; some improvement in living standards and increasing local support for the Reserve. Politically, local stakeholders became more empowered through involvement in tourism related management activities. The viability of the local and regional operators also improved significantly as they became more sophisticated in their product offerings, enhanced their facilities and gained a market share of ecotourism relative to the foreign operators. These improvements were particular true for the operators that sold package tours. However, the analyses also revealed a number of barriers with the most important ones being:

- Unresolved historic land use conflicts over rights to land with ecotourism possibilities;
- Lack of activities diversification possibilities outside the tourism season;
- Stagnating visitor numbers;
- Uneven business skills among operators;
- Poor marketing and promotional efforts;
- Insufficient ecotourism infrastructure;
- A proposed ecotourism tax;
- Low profit margin of the ecotourism operators; and
- Lack of funding for further investments

To alleviate these threats and barriers 13 general strategies were identified. An elaboration of these resulted in 39 concrete operational strategies on how potentially to implement them.

Keywords: ecotourism evaluation; biosphere reserves, world heritage sites; whale watching, grey whale
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<td>The Laguna Baja Asociación Rural de Interés Colectivo / Coalition of nine small-scale ecotourism enterprises operating in Laguna San Ignacio</td>
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<td>EJIDO</td>
<td>Organization that oversees communal land shared by the people of the community in Mexico</td>
</tr>
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<td>ESSA</td>
<td>Exportadora de Sal, S.A. de C.V./Salt Exporting Company Guerrero Negro</td>
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<td>GEF</td>
<td>Global Environmental Facilities Program of the World Bank</td>
</tr>
<tr>
<td>INE</td>
<td>Instituto Nacional de Ecología/National Institute of Ecology (Mexico)</td>
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<tr>
<td>LIVEABOARD</td>
<td>A boat designed for tourists to live aboard e.g. for fishing or diving purposes</td>
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<td>LSI</td>
<td>Laguna San Ignacio</td>
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<tr>
<td>NGO</td>
<td>Nongovernmental organization</td>
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<tr>
<td>ProEsteros</td>
<td>Mexican ngo</td>
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<tr>
<td>PROFEPA</td>
<td>Procuraduría Federal de Protección al Ambiente/Federal Attorney General’s Office for Environmental Protection (Mexico)</td>
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<td>ProNatura</td>
<td>Mexican ngo</td>
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<td>SECTOR</td>
<td>Secretaría de Turismo/Secretariat of Tourism (Mexico)</td>
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<td>SEDESOL</td>
<td>Secretaría de Desarrollo Social/Ministry of Social Development (Mexico)</td>
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<td>SEDUE</td>
<td>Secretaría de Desarrollo Urbano y Ecología/Secretariat of Urban Development and Ecology (Mexico)</td>
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<td>SEMARNAP</td>
<td>Secretaría de Medio Ambiente, Recursos Naturales, y Pesca/Ministry of Environment, Natural Resources, and Fisheries (Mexico)</td>
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<td>UMA</td>
<td>Conservation, Management, and Wildlife Use Unit</td>
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<td>UNEP</td>
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<td>VIBERE</td>
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<td>WILDCOAST</td>
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1 Introduction

1.1 Research Purpose and Objectives

This study examines the socio-economic impacts of ecotourism in the El Vizcaino Biosphere Reserve of Laguna San Ignacio, Baja California Sur, Mexico [hereafter often referred to as the Reserve]; and makes recommendation for how this activity from the perspective of local whale watching operators, can be improved. More specifically the objectives are to examine: 1) how the ecotourism activities in the Laguna San Ignacio have changed since 1994, 2) whether these changes have made ecotourism a more viable socio-economic development alternative for the communities, and 3) what strategies may be useful in overcoming identified barriers to further socio-economic benefits from future ecotourism activities.

1.2 Study Context and Significance

In a response to poverty, rapid population growth and overexploitation of natural resources Mexico has created a rising number of protected areas, primarily in the form of biosphere reserves. Unfortunately, most are failing to achieve their conservation and development objectives as they have increasingly come under pressure from human encroachment in the form of illegal settlements, poaching, expanding agricultural frontiers and legally sanctioned large-scale resource extraction such as fishing or logging (Agardy 1993; Daniele, Acerbi, & Carenzo 1999; Dedina 2000a, UNESCO 2002b, Young 1999c). These conflicts between the Mexican management of Biosphere reserves and people living within them have lead to increasing efforts to develop strategies that promote local social and economic development to reduce the pressure on these sites. One specific strategy involves the development of ecotourism. In a growing number of cases, proponents argue that ecotourism is one of the few viable alternatives for ensuring the sustainability of protected areas. This is because of its non-extractive nature, in addition to a symbiotic and bi-directional relationship in which ecotourism can provide incentives for protection, and well-managed protected areas offer encouragement for visitation (Agardy 1993). Unfortunately, most studies indicate that ecotourism is no panacea for development because of its potentially adverse economic, social and environmental implications. These include detrimental impacts on wildlife and fragile ecosystems from nature-based tourism (Butler 1991); a breakdown of local cultural traditions (Crandall 2002; Scheyvens 1999); a lack of economic benefits to local people (Eagles & McCool 2002); and aggravated conflicts over access to resources (Barkin 1996).

This documented scepticism increases the need to critically evaluate current impacts of ecotourism in Mexico's biosphere reserves. Such an investigation will help to define ways of overcoming identified barriers and increasing the socio-economic benefits for future sustainable development. The El Vizcaino Biosphere Reserve with its local communities in the Laguna San Ignacio (LSI) represents one region
where ecotourism as a sustainable development tool has been employed. While ecotourism has been growing rapidly since the 1990s, it is uncertain whether the socio-economic impacts have been positive or negative. Such a question is important to address, because the future success of the Reserve and its communities depends on finding non-extractive economic alternatives to its non-sustainable fishing activities.

Empowerment of local communities is increasingly seen as an inseparable component for minimizing negative impacts. This study argues in an ecotourism context that this can only be done by improving the viability of local tourism operators and their businesses. It is the stakeholder group from which most socio-economic benefits derive (Eagles & McCool 2002). Overall, this study provides one step towards a better understanding of strategies, which can make ecotourism more viable and beneficial for both community and biosphere development. Because, the study is carried out from the perspective of local community and tour operators it is hoped that the findings of this research will be used by them to sustain their ecotourism activities.

1.3 Report Organization

This thesis is divided into seven chapters. Chapter one is an introduction, and contains a short description of the study context and significance, and an overview of the methods. Chapter two provides a literature review of several important issues relevant to the development of community based ecotourism in biospheres. First, it briefly outlines the function and purpose of Biosphere reserves and why they are under threat in Mexico. Then ecotourism is discussed as an option for development. Its relevance as a conservation tool is then assessed as well as some of the critical issues that make its use as a development vehicle problematic. The emphasis here is on presenting an indicator framework that from the perspective of the host community and local tour operators can be used to evaluate the success and viability of ecotourism in any given biosphere reserve. Chapter three outlines the research objectives. Chapter four provides an in-depth description of the research methods used, including the scope and the limitations of the investigation. Chapter five introduces the case study context, by outlining the history and characteristics of the El Vizcaino Biosphere Reserve and the local community of Laguna San Ignacio. The emphasis is on identifying the ecotourism development issues facing the community prior to 1994. Based on the collected data, Chapter six analyses how ecotourism in the area has changed. To guide these discussion indicators was based on economic benefits from ecotourism, local involvement in tourism planning and management, community cohesion and identity, local support for the biosphere reserve and the viability of the tourism operators. Chapter seven discusses the barriers for ecotourism growth, their management implications and a number of general strategies on how to overcome them. The final chapter, Chapter eight, summarizes the findings of the research questions. It also discusses the validity of the results and approach used and suggests what direction future research should take.
2 Literature Review

This section first outlines the function of biosphere reserves as a tool for conservation, the issues facing these reserves in Mexico and why they must create local social economic benefits to work. Then the review describes what ecotourism is, why it has become a critical component in the establishment and management of Biosphere Reserves, and the reasons why it has proven so difficult to implement successfully. Finally, an indicator based framework for evaluating ecotourism activities in biospheres reserves from the viewpoint of local tourism operators and communities is presented.

2.1 Biosphere Reserves: Origins and Importance

2.1.1 The Evolution of Protected Areas

The World Conservation Union (IUCN) defines a protected area as an “area of land and/or sea especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural resources, and managed through legal or other effective means” (Eagles & Bowman 1999).

The concept of protected areas has a long history. For example, in India, areas for the protection of natural resources were created over two millennia ago (Holdgate, 1999). In Europe, parks were set aside as hunting grounds for the rich and powerful since the beginning of the medieval ages. The more recent protected areas movement has its origin in the beginning of the nineteenth century in the then “new” nations of Australia, Canada, New Zealand, South Africa and the USA. More specifically, the first true national park was established in 1872 with the dedication of Yellowstone by United States law “as a public park or pleasuring ground for the benefit and enjoyment of the people” (Eagles & McCool 2002). Since then there has been a steady increase in both the extent and number of protected areas. Overall, by the year 2002 some 44,000 sites in the world met the IUCN definition of a protected area (Eagles & McCool 2002).
With the expansion of protected areas, the conceptual thinking behind them has also evolved. In the developing world they have often been established with little or no regard for the needs of local people (Brandon & Wells 1992). Some good examples of parks in this category are Andohahela (Madagascar), Bururi and Rumonge (Burundi), Leuser (Nepal), Corcovado (Costa Rica), Kao Yai (Thailand), Usambarra (Tanzania) and Yanachenga-Chemillen (Peru). In these areas local inhabitants have been forcibly evicted or allowed to remain in small enclaves inside the boundaries but are legally excluded from the parks (Wells & Brandon 1992).

Communities next to protected area boundaries frequently bare substantial costs as a result of lost access while receiving few benefits in return (Agardy 1993; Roberts & Hawkins 2000; Wells & Brandon 1992). Local residents, who tend to be poor in the developing world, will often perceive the protected areas as restricting their ability to make a living. It is therefore not surprising that growing populations and unsustainable land use practices frequently lead to illegal and destructive encroachment. Consequently there has been a growing realization that traditional regulatory policies using guards and penalties to exclude local people – sometimes characterized as the ‘fences and fines’ approach – fail to protect natural areas (Alder 1996; Brandon & Wells 1992; Eagles & McCool 2002; Leitman 1998; Pollnac & Crawford 2000). Leitman (1998) points out that such policies (1) are often inadequately enforced; (2) can be costly to monitor; (3) can place land owners on the defensive; and (4) often fail to initiate positive action for conservation.
Today it is widely recognized that the successful long-term management of protected areas depends on the cooperation and support of local people. It is no longer ethically nor politically feasible to exclude the poor who have limited access to resources from protected areas, without providing them with alternatives (Kay & Alder 1999; Salm & Clark 2000; Wells & Brandon 1992). New approaches in the developing world have involved promoting multiple use areas - such as biosphere reserves - that focus on integrating local people with conservation efforts (UNESCO 2002a; UNESCO 2002b).

2.1.2 The Creation of Biosphere reserves

Biosphere reserves are areas of terrestrial and coastal/marine ecosystems or a combination that aims to promote biodiversity through sustainable development. Internationally recognized within the worldwide network of UNESCO's program on Man and the Biosphere (MAB), the concept of biosphere reserves arose in the late 1960s as an alternative to the national park ideal (Ishiwaran 1972). The aim of UNESCO was initially to establish a network of reserves that would protect the world's major ecological units in a more sustainable fashion than conventional protected areas. However this goal has, since the 1980s, expanded to include the need to reconcile the utilization of natural resources with long-term protection of biodiversity (Brunckhoorst & Bridgewater 1999). As of February 2003, more than 400 biosphere reserves have been implemented in 125 countries (UNESCO 2002a).

UNESCO outlines three complementary and mutually reinforcing functions which biosphere reserves are intended to fulfill:

- A conservation function - to contribute to the conservation of landscapes, ecosystems, species and genetic variation
- A development function - to foster economic and human development which is socio-culturally and ecologically sustainable
- A logistic function - to provide support for research, monitoring, education and information exchange related to local, national and global issues of conservation and development

2.2 How do Biosphere reserves differ from other parks?

Even though biosphere reserves sometimes simultaneously encompass areas protected under other systems (such as national parks or nature reserves) or other internationally recognized sites (such as World Heritage Sites), they can be distinguished from the conventional model of national park in a number of different aspects. First, biosphere reserves are areas of genuine biological diversity and are usually inhabited by species that are considered to be endemic, threatened or in danger of extinction. Second, they are fundamentally concerned with whole landscape processes, whether inside or outside the
protected areas, across a variety of land tenures and uses (Brunckhoorst & Bridgewater 1999). In this regard, biosphere reserves aim to sustain biodiversity and productive capacity on a regional scale that is appropriate to the ecological processes as well as human use and cultural identity within that landscape (UNESCO 2002b). This is different from many national parks that are often not the most biologically diverse areas, but instead are noteworthy for historical or aesthetic reasons (Planeta.com 2002). Third, biosphere reserves also differ from the conventional protected areas by being multiple areas where existing local resource use and habitation is permitted in designated areas. A biosphere reserve is, thus, by definition more supportive of local communities. People and their activities are considered a natural part of a biosphere reserve and should be encouraged to participate in related programs at a local level (UNESCO 2002b). Through such involvement greater acceptance and understanding of the need to conserve biodiversity becomes apparent, and helps to ensure the operation of the biosphere reserve at a regional scale. It also encourages social transformation of attitudes and values towards a more sustainable future (UNESCO 2002b). Not surprisingly biosphere reserves have generally proven better than other types of parks in establishing positive relations with local people (Brunckhoorst & Bridgewater 1999).

To integrate human development with conservation, biosphere reserves are usually divided into three different zones that allow for varying degrees of use and protection: core, buffer and transitional zones (Figure 2):

**Figure 2: Biosphere Reserve Zonation**

![Biosphere Reserve Zonation Diagram](image)

*Source: UNESCO 2002*

In *core zones*, human activities are normally forbidden, except for research and monitoring. (UNESCO 2002a). Surrounding the core zone is usually a clearly delineated area referred to as the *buffer zone*. Activities within this area are strictly regulated to allow only those that do not hinder the conservation objectives of the core zone but rather help to protect it, hence the idea of buffering. Typical uses in this zone include education, training, research and tourism (UNESCO 2002a). In the *outer transition zone* activities take place that may contain a variety of agricultural activities, human settlements and other uses including tourism. It is here that park management seeks to work together with local communities to
manage and sustainably develop the area's resources for the benefit of both environmental and people values (UNESCO 2002a).

Such zoning can define and clarify boundaries, while helping resolve conflicts over land use access. It can also strengthen partnerships among local users with governing agencies, conservation organizations and reserve managers (Batisse 1982, 1986, 1993; Ishiwaran 1992; UNESCO 1995; von Droste). From a tourism perspective, there are several benefits of such zoning (Eagles & McCool 2002):

1. The process of zoning helps managers, operators, visitors and local communities to understand which park values are located where;

2. Zoning oriented to establishing standards of acceptable human impact helps to manage the spread of undesirable impacts; and

3. Zoning provides a better understanding of the distribution and nature of different recreation and tourism opportunities within and around the protected area.

Biosphere legislation generally establishes a single management authority responsible for both the fully protected core zones and the other areas set aside for human use. Granting such sole jurisdiction can simplify overall park management and make it easier to coordinate community development projects and conservation projects. Rules and regulations are therefore often more flexible and adapted to local needs, than what is found in conventional national parks (UNESCO 2002a). The table below summarizes some of the documented benefits biosphere reserves can provide:

Table 1: Benefits of Biosphere Reserves

<table>
<thead>
<tr>
<th>Value category</th>
<th>Main purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conservation values</td>
<td>Maintenance of biological functions and biological diversity;</td>
</tr>
<tr>
<td></td>
<td>conservation of representative habitats and habitats of rare and endangered</td>
</tr>
<tr>
<td></td>
<td>species (Agardy 1993; UNESCO 2002a)</td>
</tr>
<tr>
<td>Recreational values</td>
<td>Enhanced recreational opportunities, such as ecotourism (Eagles &amp; McCool 2002)</td>
</tr>
<tr>
<td>Commercial values</td>
<td>Sustainable use of species and ecosystem (Bohnsack 1996);</td>
</tr>
<tr>
<td></td>
<td>employment opportunities (UNESCO 2002a)</td>
</tr>
<tr>
<td>Research/Education values</td>
<td>Increased understanding of natural systems and human impacts (Brunckhoorst &amp; Bridgewater 1999; UNESCO 2002a); interpretation for the purpose of tourism (Agardy 1993)</td>
</tr>
<tr>
<td>Historic values</td>
<td>Protection of archaeological, historical and cultural sites (Agardy 2000)</td>
</tr>
<tr>
<td>Management values</td>
<td>Provision of baseline data; simplification of use and monitoring; buffer</td>
</tr>
<tr>
<td></td>
<td>against uncertainty (UNESCO 2002b)</td>
</tr>
<tr>
<td>Community values</td>
<td>Greater influence in local land-use decision-making; reduced conflict with</td>
</tr>
<tr>
<td></td>
<td>protected area management; enhancement of traditional activities and culture;</td>
</tr>
<tr>
<td></td>
<td>healthier environment (Brunckhoorst &amp; Bridgewater 1999; UNESCO 2002a; UNESCO 2002b)</td>
</tr>
</tbody>
</table>
2.3 Are Biosphere Reserves working? The Case of Mexico

Since 1978, biosphere reserves in Mexico have become an increasing popular form of nature protection. The country’s 26 biosphere reserves now cover 70% of all its protected areas (Young 1999a). Unfortunately many of these reserves are threatened by human activities within and around site boundaries. These negative impacts include spontaneous colonization, poaching, and legally sanctioned, large-scale resource extraction (Dedina 2000a; Young 1999c). As a result, consensus has been building among policymakers, resource managers, scientists, and environmental advocates that most of Mexico’s reserves have failed, both in ecological and social terms (Vargas M. 1984; Breceda S. and others 1991; Simonian 1995). One example of such failure is the protected areas of the Lagunas de Chacagua on the coast of Oaxaca that lost 40 percent of its forest due to illegal logging. Another is the Parque Nacional El Nevado de Toluca, a volcano which is now 75 percent deforested (Planeta.com 2002).

These problems threaten not only biodiversity, but also the viability of the communities that lives inside or close to these reserves. This raises at least one important question: Why has it been so difficult to translate community-based conservation rhetoric of biosphere reserves into on-the-ground nature-protection efforts? Ultimately, the future of biosphere reserves will depend not only on understanding these questions, but also finding new or improved community development models to address and solve them.

Unfortunately it is difficult to generalize about the underlying causes of the threats facing biosphere reserves in Mexico. The reserves vary not only in geophysical features, size and level of human exploitation, but also in the local institutional structures that govern them. However, some of the underlying causes frequently mentioned include:

- Over-centralized decision-making;
- Insufficient community involvement;
- Funding shortages;
- Conflicting land tenure rights;
- Rapid population growth; and
- Failure to create socioeconomic incentives for conservation and poverty (Almada, Gomez-Morin, & Fischer 1993; Brandon & Wells 1992; Dedina 2000a; SEMARNAP 2000; Young E 2001)

These causes are described in the following sections.

---

1 Not all of Mexico's biosphere reserves are part of MAB. Those that were included in 2002 are Calakmul, El Cielo, El Pinacate y Gran Desierto de Altar, El Triunfo, El Vizcaino, Mapimi, Michilin, La Monte Azules, Sian Ka'an and Sierra de Manantlan.
2.3.1 Centralization

Mexico has traditionally favored strong centralized policies, where territorial autonomy has been seen as a threat to authority. This form of governance has been characterized as being not only centralized, but also highly autocratic, non-democratic, hierarchical, bureaucratic and corrupt (Dedina 2000a). This has lead to policies not enforced by law, but instead addressed by lobbying the right people inside government (Young 2001). The centralized ‘top-down’ structures have also created other institutional hurdles in the form of weak coordination with other public, social and economic agencies; overlapping responsibilities between sectoral and environmental institutions and a lack of long term planning (Young 1999c). For instance it was not until 1995 that it became mandatory for biosphere reserves to develop management plans (SEMARNAP 2000).

The highly centralized conservation infrastructure in Mexico has also meant that relatively few resources were historically allocated for on-the-ground programs in protected areas (Young 1995a). Such policies have, thus, impeded the development of conservation infrastructures that integrate local needs, concerns, and priorities into program planning. But more importantly, they have hindered a meaningful, ongoing dialogue among managers of protected areas, local communities, and other stakeholders. Without such communication, community-based conservation is unlikely to succeed. (Almada et al., 1993).

2.3.2 Community Involvement

Mexico has been slow to reinforce existing stewardship practices among indigenous groups by promoting land security and self-determination (Young 1999c). Such ideas were not part of the political agenda until the institutional reforms became the policy of Mexico’s environmental ministry SEMARNAP in 1994 (SEMARNAP 2000). While the participation of local reserve inhabitants in planning, biological research, and developing environmentally sound economic activities has helped build local support for Mexico’s Mapimi Desert Biosphere Reserve in Durango and Sian Kaan Biosphere Reserve in Quintana Roo, it has been extremely difficult to integrate local people into efforts to promote nature protection in most of Mexico’s other biosphere reserves (Young 1995a). The difficulty reflects, in part, the nature of the communities involved, many of which may be defined more by division and conflict than by unity and cooperation in local resource use and management (Dedina & E. 1995). Many studies also suggest that community involvement by itself rarely is sufficient to create conservation incentives. Communities often lack the needed organizational skills, ideas or financial support to change behavior (Christie & White 1997; Wells & Brandon 1992). In the Mexican biosphere reserves, central-state governments, outside scientists, and international environmental organizations have dominated the discourse of community-based conservation by defining the agendas for local resource management (Dedina 1996).
2.3.3 Lack of Funding

These previous mentioned problems are not only associated with Mexico’s centralized institutional structure, but also with a severe lack of funding in general (Dedina 2000a). In 1995, the federal budget for all protected areas was approximately one million US dollars. This is a meager budget for protecting the 22 million acres that are part of the Mexican system of protected areas (Planeta.com 2002). It makes law enforcement virtually non-existent since there is little money for staff, training and the equipment needed to do the surveillance and enforcement. Indeed, staff turnover has historically been high because of low pay and the failure of the Federal Government to pay salaries on time (Dedina 2000a; Knudson 1999).

In response to this severe funding shortage, currently, the El Vizcaino Biosphere, in addition to 10 other of the most ecologically significant protected areas in Mexico is now receiving financial support from the Global Environmental Facility Program (GEF). This program is designed to boost management, training and conservation efforts, with the goal of helping the reserves to become self-financed entities (Planeta.com 2002).

2.3.4 Land Tenure

Management of protected areas is also faced with challenges related to land tenure. In Mexico, the federal government owns only 15% of the land within existing protected areas (Planeta 2002). This is a problem because landowners within these are not legally required to follow the plans of government agencies. Protected area managers face great challenges in implementing protected area policies as they depend upon the voluntary actions of landowners (Gomez-Pompa and Kaus 1999).

2.3.5 Mexico’s Population Growth

Biosphere reserve management challenges are also exacerbated by Mexico’s rapid population growth. The nation’s population has almost tripled from an estimated 35 million people in 1960 to 103 million people in 2001. This rapid increase has dramatically intensified the pressure on development and exploitation within and around many of Mexico’s biosphere reserves. In many areas such pressure, coupled with poverty, has resulted in increasing unlawful activities like poaching, drug trafficking and illegal settlements (Spalding 1999).

2.3.6 Poverty

Research shows that poverty tends to force people to opportunistically search for employment, employ unsustainable methods of resource extraction, and resist management from fear or income loss in biosphere reserves. Poverty and low-income salaries also encourage corruption among resource managers (Christie & White 1997). As a result, there has been a growing attention to reduce poverty in order to achieve biosphere objectives.
In 1995 the goal of poverty reduction was stated explicitly in the "Seville Strategy" and the "Statutory Framework" for the World Biosphere Reserve Network. In both these documents the development needs of the local population was highlighted as a basic requirement needed to ensure appropriate management of most parks and reserves. These documents suggested that measures such as education, revenue sharing, participation in decisions, and appropriate schemes for alternative economic development as a means of addressing this challenge (Daniele, Acerbi, & Carenzo 1999). Mexico has been slow to follow these recommendations. In fact, most Mexican biosphere reserves have traditionally been run with little or no regard for the needs of local communities. For example, Young (2001) points out that the inhabitants of El Vizcaino biosphere reserve have been marginalized by the same conservation process, which was meant to engage them in promoting natural resource protection and reduce chronic marginalization.

2.4 Strategies to Make Biospheres Reserves Work

In recognizing the issues and challenges facing its biosphere reserves, since the mid-1990s Mexico has embarked on a number of new strategies to strengthen and improve the management of these areas. These strategies include:

- decentralization;
- restructuring of government agencies;
- implementing and enforcing stronger laws; and
- alleviating poverty through alternative economic development (SEMARNAP 2000).

Under former president Salinas, drastic changes were made to the governing structure of Mexico’s protected areas as a whole. In 1994 and in recognition of previous management and institutional failures, a new government agency, SEMARNAP, was established. Its purpose was to integrate resource management policies and programs spread between different agencies including PESCA (Mexico's Ministry of Fisheries), INE (National Institute of Ecology) and PROFEPA (Attorney General's Office for Environmental Protection) (Dedina 2000a). Another important development was the strengthening of the legal foundation for Mexico’s protected areas with the Program for Wildlife Conservation and Productive Diversification in the Rural Sector (1997) and the Program for Mexican Natural Areas 1995-2000. The latter program was significant, because it granted more autonomy to reserve managers and emphasized community empowerment through increased local participation, capacity building, and alternative employment opportunities. The government hope that such measures will generate sufficient local benefits to reduce poverty, lessen dependence on traditional development activities and hinder illegal ones (SEMARNAP 2000). This program also recognized ecotourism as one of the important options for improving the sustainability of the biosphere reserves.
Most of these policy changes are relatively new. Consequently, very little has therefore been published on the effects of these changes. Nevertheless, there seem to be consensus that Mexico has taken some new steps to solve some, if not all of the complex problems facing its protected areas in general (Dedina 2000a).

2.5 Ecotourism – Importance and Relevance to Mexico’s Biosphere Reserves

This section describes ecotourism as a concept and identifies linkages with biosphere reserves in an Mexican context. It also outlines the benefits and problems of ecotourism; and identifies a framework based on principles and indicators that can be used to evaluate the success of ecotourism from the perspective of the community and local tourism providers.

2.5.1 What is Ecotourism?

General agreement exists that ecotourism is travel to natural areas that supports conservation activities, contributes to local development and leads to greater understanding and appreciation of the natural and cultural environment (Wood 2001b). However, much confusion surrounds the term ‘ecotourism’. Critics point out that the general wording and multidimensional character of most definitions make it impossible to reach a consensus on what actually constitutes this phenomenon (Fennell 2003; Wood 2001a). This is hardly surprising, since ecotourism lacks a common operational definition, contains a variety of players and activities, and only recently has started to develop certification standards (Page 2003). As a result the term ecotourism has often been used as a marketing strategy to dress up existing tourism activities to appear more green (Blamey 1997; Vanasselt 2000).

Much debate exists in the literature concerning what criteria should be used to distinguish ecotourism from other forms of tourism. For instance, Pearce (1995) argues that a 'false distinction' is being made between tourism and ecotourism. He finds that both nature-based tourism and ecotourism 'should be considered as woven into the broader fabric of tourism, and should not be limited by artificially trying to categorize the phenomenon. However, others argue that ecotourism should indeed be viewed as a separate category. What distinguishes it from nature, cultural, or adventure tourism is not its degree of specialization, as much as its emphasis on its ethical values and principles (Diamantis 1999; Ross & Wall 1999). These discussions have led to such distinguishing features as the motivations for participating; the presence and scale of environmental, social and economic impacts; and the presence and scale of environmental services offered by the providers of these experiences (Blamey 1997; Scheyvens 1999; Wallace 2002). However, much of the confusion and debate stems from the fact that ecotourism
can be perceived both as a form of sustainable development, as well as a niche market segment of nature tourism with sustainable and unsustainable characteristics (UNEP 2002b; Wood 2001a). Nevertheless, general agreement exist that ecotourism should have all of the following characteristics (Eagles & McCool 2002):

- Contribute to the conservation of biodiversity;
- Sustain the wellbeing of local people;
- Include an interpretation / learning experience;
- Involve responsible action on the parts of tourists and the tourism industry;
- Be delivered primarily to small groups by small businesses;
- Require the lowest possible consumption of non-renewable resources; and
- Stress local participation, ownership and business opportunities

### 2.5.2 Definition of Ecotourism Used in This Thesis

The definition of ecotourism used in this study’s research is that one used by the World Conservation Union (IUCN) Commission on National Parks and Protected Areas (CNPPA) definition:

"Environmentally responsible travel and visitation to relatively undisturbed areas, in order to enjoy and appreciate nature (and any accompanying cultural features – both past and present) that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations”

This definition can be applied to subsets of nature, culture and adventure tourism and has an ethical overlay that links sustainability with community empowerment (Wallace 2002). It also fits well with Mexico’s Ministry of Tourism own definition of what they consider the country’s most important tourism product categories for eco- and adventure based tourism activities (Sectur 2001).

### 2.5.3 Ecotourism in Mexico’s Biosphere Reserves

The link between tourism and biosphere reserves in Mexico is as old as the establishments of the biosphere reserves themselves. In these areas, tourism has been an acceptable form of economic development from the beginning (Ward 1997b). Most biosphere reserves in Mexico have some ecotourism activities already implemented. Unfortunately monitoring of the visitor numbers and tourist activities by ecotourism is limited. Consequently, there are no estimates of the current and projected market size and value of ecotourism to Mexico’s biosphere reserves (Sectur 2001). However, since most ecotourism activities take place in protected areas (Eagles & McCool 2002) general figures and trends
related to ecotourism do provide some insight into the current nature of ecotourism activities in Mexico's biosphere reserves.

Mexico is one of the world’s top ten tourist destinations. In 2000, the country had more than 20 million international visitors. In the same year, tourism employed 6.1% of the work force, and accounted for 8.2% of Mexico's GNP. This made it one of the country's top industries (Sectur 2001). The country has in the last decade, like many others in accordance with changing world trends, shifted towards meeting the increased ecotourism demand. However, Mexico's ecotourism development is still regarded as being in its infancy. In 2000, the most popular ecotourism and adventure tourism activities accounted for only 0.62 percent of the US$ 8.3 billion spent by foreign tourists in Mexico (National Tourism Program, 2001-2006) (Table 2). Three ecotourism activities accounted for most of the US$ 51.2 million generated in total revenue: scuba diving 47%, appreciation of natural systems 19% and whale watching 7.5% (Sectur 2001). In 2001, approximately 420 local companies were identified as providers of ecotourism and adventure activities in Mexico (Sectur 2001):

Table 2: Most Popular Eco- and Adventure Tourism Activities Conducted in Mexico 2000

- Bird watching
- Butterfly watching
- Cave exploring
- Ecosystem observation, star gazing, flora observation, and photographic safaris
- Hang gliding
- Hiking
- Horse riding
- Hot-air balloon flights
- Kayaking
- Mountaineering, rock climbing, and rappelling
- Mountain biking
- Parachuting
- Paragliding
- Rock digging and fossil hunting
- Snorkelling, scuba diving and cave diving
- Turtle watching
- Ultra light Flying
- Whale watching
- White-water rafting

Source: Sectur 2001

The relative low level of ecotourism development in Mexico is hardly surprising. Historically, the country has favored large scale tourism development like that found in Cancun or Acapulco (Ward 1997a). Mexico does not yet have any long-term development plan and strategy for ecotourism development. However, ecotourism is increasingly gaining government support. In 2001, an agreement was signed with various Mexican government agencies to invest US $250 million in ecotourism – compared to just US$50
in 2000 (Fullerton 2002). Mexico hopes to capitalize on the growing demand for ecotourism expanding at about five times the average rate of the tourism industry as a whole. (WTO 2003).

Proponents argue that Mexico’s biosphere reserves are in an unique position to benefit from this growth. They feel that this nation has the characteristics needed to make it attractive for ecotourism development (Daniele, Acerbi, & Carenzo 1999; Sectur 2001; Ward 1997a). These traits include:

- Pristine nature with hundreds of endemic species and an abundance of charismatic mega fauna of high interest to ecotourism activities;
- A tropical climate ideal for activities all year round;
- A well developed tourist infrastructure already in place to facilitate access and accommodate visitors;
- A variety of other high quality tourism attractions like Aztec ruins and pristine beaches found within or close to most reserves adds value and choice to the tourism experience;
- A stable political climate safe to visitors; and
- A close proximity to the major tourism markets of the USA and Canada.

However, the shift towards more ecotourism development is not only a reflection of the positive prospects for growth, but also mirrors a growing environmental awareness in Mexico (Young 1999a). Having seen the negative, environmental effects that mass tourism development has had in destinations like Cancun, the government is increasingly searching for economic alternatives to mass tourism (Ward 1997b; Young 1999c). Ecotourism development is not only being pushed by Mexico’s Ministry of Tourism (SECTUR), but also by the Ministry of the Environment (INE) and many of the country’s leading NGOs dealing with environmental and community development issues in protected areas. These proponents point out that ecotourism represents one of the few options available for balancing conservation with economic development. When implemented successfully ecotourism is perceived to create incentives for protection through revenue, education, local participation and capacity building (Ross & Wall 1999). This is done by providing locals with jobs and income alternatives to traditional resource extractive related employment, illegal activities, and unemployment (Diamantis 1999; Fennell & Dowling 2003). From a management perspective ecotourism can become a source of financing fall the activities needed to keep the environment pristine and well managed (Wallace 2002). Ecotourism is used as an economic justification for the biosphere reserve development because it has the potential to improve local living standards and
help overcome local resistance to conservation oriented management rules and regulations (Brandon & Wells 1992; Leitman 1998).

Unfortunately ecotourism is not easy to implement successfully. There are many examples where ecotourism has worked against rather than for local communities and protected areas (Boo 1995; Brandon & Wells 1992; Scheyvens 1999). Some of the numerous drawbacks from ecotourism activities have included adverse impacts on wildlife and fragile ecosystems (Bookbinder 1998; Diamantis 1999; Vanasselt 2000); the breakdown of local cultural traditions (Crandall 2002; Pizam & Milman 1984); few economic benefits to local people (Dedina & E. 1995; Young 1999a) and protected areas (Brandon & Wells 1992; Ward 1997a; Wells & Brandon 1992); and aggravated conflicts over access to resources (Buckley 2003; Salm & Clark 2000). In such areas, ecotourism is believed to be a major activity generating a full range of economic, social and environmental impacts that can be both positive and negative.

Although, little has been published on ecotourism activities in Mexico’s biosphere reserves the few case studies available confirm the complexities in implementing ecotourism successfully. In the Mexican biosphere of Si’an Kaan, it has helped limit unrestricted access to resources, facilitated local empowerment, provided economic means for management and employment while successfully protecting critical natural areas (Agardy 1993). Similar development in Mexico’s Monarch Butterfly Biosphere Reserve has made local agriculture non profitable and forced village farmers into illegal logging practices for survival. This negative development in the Monarch Butterfly Biosphere Reserve has happened despite rapid growth in the number of visitors from 25,000 people in 1986 to 250,000 in 1998/99 (Buckley 2003).

The role of ecotourism as a tool for community development and conservation management is therefore highly disputed. This situation has increased the need to evaluate the current socioeconomic and environmental impacts of current ecotourism activities in Mexico. It has also escalated the importance of understanding the underlying conditions leading to success and failure of this form of development (Eagles & McCool 2002; UNESCO 2002b; Wallace 2002). Mexico’s Ministry of Tourism (SECTUR) has already warned that the skills and capacities of local operators remains a crucial barrier to overcome for a more economically viable tourism industry to emerge (Sectur 2001).
2.6 What is Successful Ecotourism? A Suggested Framework for Evaluating Ecotourism from the Perspective of the Host Community and Local Tour Operators.

A number of different issues arise in trying to determine what constitutes successful ecotourism. Wide expectations exist that ecotourism can help balance conservation with development. However, by striving to satisfy a myriad of loosely defined environmental, social, economic, and cultural objectives at multiple levels of society, it is inherently difficult to find common ground on how to determine, measure, and analyze the criteria for success of ecotourism activities in absolute terms (Blamey 1997; Ross & Wall 1999; Wallace 2002).

Generally ecotourism is associated with a wide variety of environmental, social and economic impacts. These impacts can be classified in various ways: positive or negative; direct or indirect; immediate or cumulative; and short-term or long term (Wong 1998). These impacts also tend to vary dramatically from one reserve to reserve because of various factors. These include differences among state economies, the relative and absolute size of the tourism sector; the rate of growth of tourism, the nature of the tourism facilities involved; and a score of environmental factors including geology, climate and existing natural communities (Eagles & McCool 2002).

It is not surprising that almost all studies find both positive and negative impacts of ecotourism development (Butler 1992) and it is difficult to generalize about the underlying causes of its performance (Mason 2003). All ecotourism development is likely to involve some tradeoffs between development and conservation. Empirical research suggests that local residents are willing to accept some negative consequences as long as ecotourism is perceived as bringing more positive benefits. However, whether impacts are perceived as positive or negative depends very much on the value position of the stakeholder. According to Eagles (2002), four stakeholder groups are particularly important in decisions concerning ecotourism development in protected areas: (1) society in general, including local communities, (2) park managers, (3) tourism operators, and (4) visitors. Each group views the social, economic or environmental benefits of ecotourism from their own motivations and perspectives:

- Biosphere managers primarily see ecotourism as a means to promote conservation;
- Local communities adopt ecotourism mostly to improve their livelihood;
- Tourism operators work to ensure survival and maximize profit from ecotourism ventures; and
- Tourists visit ecotourism areas for enhanced personal experiences.

Some important observations emerge from these differences in stakeholder objectives. The first point is that what benefits one group of stakeholders might put others at a disadvantage since not all groups are
likely to benefit or share the cost equally of implementing ecotourism (Fennell 2003). Success and failure of ecotourism is therefore relative to the point of view of the stakeholder. It is also evident that it is such differences in values and expectations that can lead to conflicts between these groups. For example, tourism operators might wish to promote tourism development further than permitted by reserve legislation, oppose fees paid to management of the biosphere reserves and efforts to empower locals because such actions are perceived as threats or a hindrance to the achievement of business objectives (Eagles & McCool 2002). Any evaluation of ecotourism in biosphere reserves should therefore state the value position of the commentator (Mason 2003).

This research suggests a framework to evaluate the success of ecotourism activities based on the following six basic objectives:

- Ecotourism must limit environmental impacts and contribute to the conservation and management of the biosphere reserve.
- Ecotourism must direct sufficient economic benefits to local people in ways that complement rather than overwhelm traditional practices
- Successful ecotourism should improve the wellbeing and cohesion of the community
- Ecotourism should increase the participation of local people in the decision making process
- Ecotourism should increase local support for biosphere reserves
- Ecotourism operators must be profitable

These objectives reflect commonly expected goals and benefits from ecotourism development. However, they also emphasize that ecotourism impacts should be evaluated at the community level and from the perspective of local tourism vendors. Such evaluations must include environmental as well as socioeconomic objectives. From these objectives, indicators and standards for compliance can be developed that are relevant, but also feasible to measure for any given biosphere. Some of the critical barriers that can hinder the achievement of these goals, as well some examples of possible indicators that can be used in conjunction with the objectives to measure success or failure are presented in the following paragraphs.

2.6.1 Ecotourism Must Limit Environmental Impacts and Contribute to the Conservation and Management of the Biosphere Reserve.

The most proclaimed benefit of ecotourism is its potential ability to contribute to the conservation of the natural resource base. Ecotourism depends on the quality of the natural and human environment. In most
cases it is assumed that ecotourism provides sufficient economic incentives to protect the environment and restore degraded habitat.

Good ecotourism operations minimize environment impacts via their dedication to small groups sizes, the appropriate choice of equipment and modes of transportation; methods of waste disposal; and use of "leave no trace" procedures (Wallace 2002). In such cases, money generated from tourism revenues - like entrance and service fees, donations and taxes - is often used to maintain, protect and offset the costs of conservation in biosphere reserves (Ross & Wall 1999)(Giongo 1993)(Eagles & McCool 2002).

Indirectly, ecotourism can help protect and restore biological and ecological processes by reducing local dependencies on traditional and potentially non-sustainable practices like fishing, logging and mining (Wells & Brandon 1992). It can also foster broader local environmental commitment among locals and visitors, through emphasis on education and commitment to empowering and involving locals in ecotourism business operations (Scheyvens 1999). This can encourage local people and authorities to better protect their resources (Pizam & Milman 1984) and convince them to comply with existing rules and regulations (Roberts & Hawkins 2000).

However, ecotourism typically takes place in pristine, often isolated and fragile parts of most biosphere reserves. These areas are also the most vulnerable to degradation (Cater 1995; Toerpfer 2001). In such sensitive areas, even a small number of tourists can bring unexpected or big changes to wildlife and the environment. While small ecotourism projects often prosper economically, they subsequently expand for additional income and revenue. Such growth can be difficult to restrain. There are many cases where ecotourism activities unintentionally have exceeded a site's carrying capacity, due to rapid growth rates, poor management and the difficulty in identifying the deterioration of the environment soon enough (Diamantis 1999). In such scenarios the distinction between ecotourism and mass tourism becomes blurred. Such issues are facing the Biosphere of Galapagos Islands, where visitor numbers have grown from 4,500 to more than 62,000 in 2000 (Vanasselt 2000). This market growth has lead to a rapid immigration from the mainland of Ecuador. As a result, the area's permanent population has nearly tripled over a 15-year period. This growth combined with exotic species introductions, big infrastructure development, pollution and over fishing are now causing serious environmental concerns, as well as increasing social tensions between tourism operators and park management. If it were not for efforts on the part of the Darwin Foundation and the Galapagos National Park to halt attempts at development, there

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3 A determination of the biophysical limits of productivity of various natural resources, with the idea that harvest or use of those resources would be at or below those limits and the trade-offs (Jackson 1984).
is little doubt that the fragile ecosystem of the Galapagos would long since have been converted to other uses (Sitnik 1999).

Table 3: Example of Risks from Tourism Activities

<table>
<thead>
<tr>
<th>Element</th>
<th>Example of Risks from Tourism Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecosystems</td>
<td>• Integrity of biological reserve processes and wildlife may be disturbed or disrupted by ecotourism development and use</td>
</tr>
<tr>
<td></td>
<td>• Soil compaction can occur in certain well-used areas and from construction.</td>
</tr>
<tr>
<td></td>
<td>• Erosion from use of trails and roads</td>
</tr>
<tr>
<td>Vegetation</td>
<td>• Trampling, transportation and other intensive use in fragile habitats can have a negative effect on vegetation.</td>
</tr>
<tr>
<td></td>
<td>• Removal of vegetation for construction, food, grazing and souvenir purposes might have negative impacts on the environment</td>
</tr>
<tr>
<td></td>
<td>• Introduction of invasive species might bring disturbance to plant community</td>
</tr>
<tr>
<td></td>
<td>• Fire frequency may change due to tourists and park tourism management.</td>
</tr>
<tr>
<td>Water</td>
<td>• Increased demands for fresh water</td>
</tr>
<tr>
<td></td>
<td>• Disposal of sewage or litter in rivers, lakes or oceans increases pollution levels.</td>
</tr>
<tr>
<td></td>
<td>• Release of oil and fuel from ships and smaller craft.</td>
</tr>
<tr>
<td>Air</td>
<td>• Motorized transportation may cause pollution from emissions</td>
</tr>
<tr>
<td>Wildlife</td>
<td>• Habitat destruction and fragmentation which occurs from a variety of construction purposes e.g. roads, trails, buildings, and moors and settlements might have threatening effects on wildlife populations</td>
</tr>
<tr>
<td></td>
<td>• Wildlife feeding can lead to behavioural changes, poor nutrition and dependence on artificial food supply</td>
</tr>
<tr>
<td></td>
<td>• Litter, garbage and pollution might influence wildlife reproduction negatively</td>
</tr>
<tr>
<td></td>
<td>• Noise, visual or harassing behaviour can increase stress and natural rates of wildlife mortality by disturbing wildlife processes such as breeding, feeding, hunting, migration routes and resting</td>
</tr>
<tr>
<td></td>
<td>• Human habituation can cause changed wildlife behaviour such as approaching people for food.</td>
</tr>
<tr>
<td></td>
<td>• Ecotourism growth might increase extraction pressures on existing wildlife e.g. in the form of over fishing, hunting for game meat, and animal souvenirs made from native species.</td>
</tr>
<tr>
<td></td>
<td>• Invasive species might accidentally be introduced from effects of transportation, escapement of pets etc.</td>
</tr>
</tbody>
</table>

Sources: (Boo 1995; Cater 1994; Diamantis 1999; Eagles & McCool 2002; Pedersen 1991; Scheyvens 1999; Toerpfer 2001; UNEP 2002b; Wearing 1999; Williams 1994; Wood 2001a; Wood 2001b)

The potential detrimental impacts of ecotourism question the validity of ecotourism as a tool for conservation. However, proponents point out most environmental impacts can be mitigated by proper planning and management (Fennell & Dowling 2003; Mason 2003; Pedersen 1991; Ross & Wall 1999; Swarbrooke 1998; UNEP 2002a). For example, this can happen through management policies and
activities that reduce the use of the entire protected areas; modify the use of problem areas; adjust the timing of use; alter the type of use; modifying visitor access and behaviour; increase the resilience of the resource; and rehabilitate impacted areas (Eagles & McCool 2002). Unfortunately, lack of financing, scarce equipment, poorly trained and insufficient staff, overlapping jurisdictions and centralized management remain serious barriers for effective management in most of the world’s biosphere reserves (Daniele, Acerbi, & Carenzo 1999; Eagles & Bowman 1999; Fennell & Dowling 2003; Mason 2003; Ross & Wall 1999; UNESCO 2002b; Wells & Brandon 1992).

Possible indicators: for measuring environment impacts from ecotourism development include: (i) Measures of biophysical change such as population dynamics, vegetative composition, erosion, water quality, wild life behaviour, and habitat; (ii) visitor group size; (iii) mode of transportation; (iv) methods of waste disposal; and (v) use of leave no trace procedures. These all imply some form of impact monitoring and such activity should be site specific.

2.6.2 Ecotourism must Direct Sufficient Economic Benefits to Local People in Ways that Complement Rather than Overwhelm Traditional Practices.

The economic rationale for ecotourism is that it leads to diversification and increases employment and income levels (UNEP 2002a). Prediction of the level of income and jobs created depends entirely on what kind of ecotourism is put in place. It is often a function of the number of visitors and their length of stay (Fennell & Dowling 2003). Direct impacts are derived from money spent by tourists on guiding, visitor fees, donations, transportation, lodging, equipment rentals, food, retail services and souvenirs; or by tourism operators who need supplies, infrastructure and manpower to run their activities (Page 2003).

Indirect economic impacts arise, when locals use their ecotourism-related salary to buy other goods and services, and pay taxes. The flow of money from ecotourism has the potential to form strong linkages with other sectors of the economy (Wearing 1999). Such effects can be in the form of foreign exchange (Wood 2001b). One example is in Costa Rica, where general nature tourism was estimated to generate over US $600 million in foreign exchange in 1994 (Eagles & McCool 2002). Similarly, the Galapagos Islands earned in the same year $4.3 million in visitor fees alone. In fact, the ecotourism activities from this biosphere reserve were responsible for over 70 percent of Ecuador's foreign exchange in 1999 (Nations 2000).

Ecotourism depends on natural areas where resource protection requires low visitor density and small group sizes (Wallace 2002). In addition most ecotourism activities are very sensitive to changes in the
season, weather, access, economic and political events (Briguglio et al. 1996). Most operations are therefore small with very modest and irregular economic returns compared to mass tourism (Ward 1997b). For local communities to benefit economically it is critical to minimize the money that flows out of biosphere reserves and to maximize the income that flows in (Sharpley & Telfer 2002).

In Tortugero National Park in Costa Rica, less than 10% of local households benefit economically from visitors (Eagles & McCool 2002). Unfortunately there are numerous other examples where a lack of local skills, and high start up costs associated with creating the infrastructure necessary to attract tourists has limited local control and involvement (Fennell 2003). Profits therefore tend to go to non-local companies or local elites rather than the community as a whole (Young 1999a). Communities are particularly vulnerable to leakage when (Eagles & McCool 2002):

- Local products are poorly diversified, or low priced;
- Jobs are occupied by non-locals;
- Tour companies are owned by foreigners;
- Services and supplies have to be imported or are purchased outside the reserve;
- Income from the reserve is used by government for other non related purposes; and
- Tourism operators have high ratios of debt and/or low profitability.

The growth of ecotourism can also increase the for more park personnel to control and manage tourism activities (Eagles & McCool 2002). Unfortunately fees and other revenue generated from ecotourism activities are often insufficient to cover the cost of managing the impacts from tourism related activities (Fennell & Dowling 2003).

Ecotourism can also indirectly conflicts with other economic activities. For instance, in the Biosphere Reserve of El Vizcaino, fishing is no longer allowed in areas where whale watching is taking place (Dedina 2000a). Opportunity costs can also arise from protected wildlife grazing on locally produced crops (Eagles & Bowman 1999). Such costs should be taken into consideration when evaluating the economic benefits from ecotourism to local communities.

**Possible indicators:** for measuring local economic benefits include: (i) Number of jobs created from ecotourism development; (ii) changes in visitor numbers; (iii) revenue generated from tourism sales; (iv) investments in infrastructure and ecotourism development; (v) increases or decreases in services provided to locals as a result of tourism; (vi) changes in income distribution among community members; (vii) payments of entrance fees for biosphere reserve management; and (viii) increases or decreases in the diversity of economic activity.
2.6.3 Successful Ecotourism Should Improve the Wellbeing and Cohesion of the Community

Successful ecotourism promotes aesthetic, spiritual and other values related to well-being. It does this by establishing and protecting attractive environments for residents, and for visitors. Local residents can also take advantage of improvements made in health services, communications, roads, water and sewage systems, electricity, and recreational facilities, which might have been built initially with tourists in mind (Fennell & Dowling 2003). Such developments can help local communities maintain or improve their living standards and quality of life (Barkin 1996; Scheyvens 1999).

Yet, infrastructure improvement, combined with new economic opportunities, often attracts an influx of people from outside the biosphere reserve. This can lead to rapid population growth, increased levels of pollution, and use of scarce resources (Page & Dowling 2002; Pizam & Milman 1984). The price of real estate can also increase as a result of speculation, or from foreign investors buying up property and taking over businesses.

The economic possibilities created from ecotourism can have both stabilizing and destabilizing effects on communities where locals are struggling to make a living from traditional overexploited resources. Ecotourism has for example in some cases been found to create more economic independence for groups, previously excluded from the job market like women and young people (Wood 2001a). While such development is generally desirable, it can cause conflicts in traditional societies, where parents or husbands have always held more power or status (Crandall 1986). Unfortunately, ecotourism activities often only call for seasonal employment, leaving residents unemployed during the slow or off-seasons (Young 1999c).

Many biosphere reserves communities are characterized by being small, non-industrialized societies, where the preservation of tradition is extremely important in terms of maintaining local self-esteem and well-being. Communities already exposed to outside influences, will likely respond differently to development opportunities than populations which have not experienced such changes (Brandon, 1996). It is difficult to generalize about the nature of social impacts, because while some community members welcome change others are likely to oppose it.

Other serious socio-cultural effects often occur when locals note the often superior material possessions of the visitors and aspire to these. This may have positive effects in that it can encourage residents to adopt more productive patterns of behavior. But more frequently it is disruptive in that locals become resentful because they are unable to obtain the goods and lifestyle demonstrated by the visitors (Burns &
Holden 1995). This may encourage the more able members of a community to migrate away in search of a better lifestyle elsewhere (Mason 2003).

Negative cultural impacts may also occur where local traditions become too commercialized, and subsequently lose their integrity or authenticity. Foreign tourists often bring different customs and values to the societies that are considered intrusive and offensive to the locals (Butler 1991). At first, this behavior might be accepted and looked upon with curiosity and tolerance. Yet, when tourist numbers increase rapidly, they often become a threat to the social foundation of the local culture and leads to antagonism towards the visitor (Eagles & Bowman 1999). Mansperger (1995) describes how groups of the Yagua Indians of the Peruvian Amazon have been relocated by tour operators to make them more accessible to tourists. As a result, they have abandoned fishing and agriculture to become dependent on money raised from cultural performances. Most significantly, the Yagua are now plagued by various forms of depression, apathy and illnesses (Mansberger 1995). In order to avoid such negative effects, some Aboriginal communities in Australia have chosen to shun direct involvement with tourists (Eagles & Bowman 1999).

However, there are also examples where ecotourism has helped revive or preserve the cultural heritage of a destination area – more specifically, monuments, ceremonies, arts and crafts and traditions - which otherwise would have been forgotten or died out. The Siaan Kan in Mexico is an example of such a biosphere (UNESCO 2003), where the self-esteem of many community members have been enhanced, because of outside recognition of the uniqueness of their culture and their traditional knowledge. This increased confidence has lead many community members to seek out further education and training opportunities.

**Possible indicators:** for measuring improvements in well-being include: (i) changes to the level and number of tourism related conflicts; (ii) exclusion or marginalization of certain groups forced by ecotourism development; (iii) local ownership over resources; (iv) changes to infant mortality; (v) visual degradation of the environment; (vi) better access to services; (vii) changes in local attitude towards tourists; (viii) improved training and education possibilities; (ix) accept of changes to community structure; (x) loss of skills and traditions; and (xi) increasing cost of living.
2.6.4 Ecotourism Should Increase the Participation of Local People in the Decision Making Process

Landuse and other types of conflicts often arise from determining how ecotourism activities should be implemented and regulated. Such tension can arise between:

- competing tourist stakeholders benefiting from the same or different activity;
- tourist stakeholders vs. traditional resource users (e.g. fishing, mining, logging);
- visitors and managers; and
- tourist users and governing agencies

Where individuals, families, ethnic or socio-economic groups compete with each other for the benefits of ecotourism without cooperating together, such conflicts are often amplified. Ecotourism therefore has the potential to displace certain societal groups (Mason 2003; Pizam & Milman 1984). In such instances, communities can become disillusioned with ecotourism and antagonistic towards visitors and each other (Scheyvens 1999).

Failing to resolve such conflicts can be detrimental to ecotourism development as well as the general support for the biosphere reserves (Wells & Brandon 1992). While some conflict is inevitable it can be better minimized if local stakeholders are involved in designing the rules and objectives for ecotourism development (Agardy 1993; Boo 1995; UNESCO 2002b). Ecotourism with public participation can help empower local stakeholders politically through actions that:

- sets up a dialogue that addresses local needs and concerns better than before;
- avoid decisions which may impact negatively on local residents;
- encourage a form of empowerment or decentralization, which allows people some control over the decision-making that affects them;
- improve cooperation among stakeholders;
- encourage the development of sympathetic community leaders (spokespersons, trainees, supervisors, advisors);
- strengthen links between conservation and development goals with local benefits;
- facilitate acceptable distribution of benefits and costs from ecotourism; and
- provide local capacity to monitor and evaluate progress of projects (Brandon 1996; Ross & Wall 1999).

The key to such participation is the early establishment and continued functioning of committees, partnerships, and other mechanisms that provide local input to public (biosphere managers, etc.) and
private (outside concessionaires, conservation groups, etc.) interests that operate in the reserve. Ideally, locals will also belong to those interests groups (Becker & Ostrom 1995).

While management actions to involve locals are absolutely critical to make ecotourism successful community participation has turned out problematic to implement well in some situations. The more groups of people and interests that are involved in setting ecotourism objectives, the more difficult it is to achieve agreement on appropriate actions (Kay & Alder 1999). This increases the management requirement in terms of needed skills, time and cost. As a general rule, the higher the degree of community involvement:

- The more staff time and energy is required;
- The more money it costs to support the process;
- The more detailed and sophisticated resource information that is requested by participants;
- The greater is the expectation of stakeholders that their contributions will be valued and used; and
- The greater the visible commitments that must be made to use the results, keep stakeholders informed, and explain any deviations from recommendations or decisions (Eagles & Bowman 1999).

In addition to the above barriers, governments are often reluctant to devolve power. Often involved communities are viewed as unqualified or unskilled to take on responsibility for managing their resources. Sometimes communities themselves are reluctant to take responsibility for decision making (Wells & Brandon 1992; Kay & Alder 1999). There are many examples where local inhabitants remain marginalized politically from any influence over the development and management of ecotourism activities (Christie & White 1997; Pollinac & Crawford 2000; Scheyvens 1999; Young 1999c).

Possible indicators: for measuring local participation in the decision making process that determine the kind of ecotourism that may occur include: (i) Presence of local institutions to deal with tourism issues; (ii) existence of collaborative efforts between operators, community and management; (iii) incorporation of local needs in biosphere management plan and tourism regulations; and (iv) local control over tourism concessions and licences.

2.6.5 Ecotourism Should Increase Local Support for Biosphere Reserves

Case studies suggest that protected areas fail to work if they obstruct local needs (Sindiga 1996). Ecotourism can increase local support by providing alternative economic development that encourages conservation and offsets some of the socioeconomic costs associated with the restrictions to resource use imposed by biosphere rules and regulations. However, in determining support for ecotourism
development the distribution of benefits is just as important as the actual benefits a community may receive (Scheyvens 1999). Studies show that local acceptance of ecotourism is directly related to how equitable the benefits are distributed throughout the communities and how much influence locals are able to exert over how ecotourism is to be implemented in the reserve. When benefits are unequally distributed, ecotourism can result in social disharmony, increased land resource use conflicts and the displacement of certain user groups (Page 2003). This is often the case when profits and ecotourism opportunities go to local elites, outside operators, and government agencies; or when other non-tourism stakeholders bear the brunt of the problems of the ecotourism initiative without getting any benefits in return (Mason 2003; Swarbrooke 1998). However, when benefits are widely distributed it has helped empower locals politically and socially. Such support has been manifested in greater local environmental awareness, higher rates of compliance with management rules, lower levels of poaching and improved relationship with managing agencies (Agardy 1993; Bookbinder 1998; UNESCO 2002b).

**Possible indicators:** for measuring local support for biosphere reserves include: (i) Tourism revenue reinvested in community projects; (ii) local adherence to tourism and biosphere regulations; (iii) local participation in monitoring and enforcement; (iv) levels of poaching by locals; (v) local attitude towards managing agencies; (vi) level of cooperation in infrastructure maintenance and improvements; (vii) perception of visiting tourists; (viii) increased local levels of environmental awareness; and (ix) local acceptance of established entrance fees.

### 2.6.6 Ecotourism Operators must be Profitable

It is money spent by visitors on product and services that is the foundation for all the socioeconomic benefits created by ecotourism (Fennell 2003; Kotler, Haider, & Rein 1993). Locals benefits in the form of jobs, salaries and potential infrastructure investments; while governing agencies get income to finance reserve activities in the form of visitor fees and increased local support for the biosphere reserve (Eagles & McCool 2002). Success of ecotourism must be largely evaluated based on the economic viability of local suppliers of ecotourism activities (Page 2003). However, there are many problems and barriers that can influence the profitability of ecotourism vendors. These include:

- **Lack of Low Cost Financing** - Ecotourism projects rarely succeed as quickly or as profitably as other sectors. It requires a long-term financial commitment (Wallace 2002). Unfortunately, local tour operators and vendors often do not have the financial resources needed to get the training, supplies, infrastructure and vehicles required to run a successful enterprise (Eagles & McCool 2002). Such problems are intensified by the lack of access to capital in developing countries where loans tend to
be both short term and highly expensive (Phillips 1999). Lending agencies also prefer "bricks and mortar" projects so they have something to repose should it fail (Robinson 2001). There is a need to identify financial sources and low cost financing mechanisms for long-term investment which develops and supports sustainable forms of ecotourism (UNESCO 2002b).

- **High Operating Costs** - Often investments in equipment, marketing and services are necessary to attract more customers (Kotler, Haider, & Rein 1993). Unfortunately, ecotourism typically involves small business operations which have difficulty achieving reasonable economies of scale (Wallace 2002). It can therefore be very risky to invest in efforts to attract more visitors. It is not surprising that many ecotourism companies suffer from low profit margins due to the poor combination of having high overhead costs and few visitors (Thomas 1998).

- **Business and Marketing Skills** - Local tourism operators and vendors often fail to stay in business because they lack the international networks, marketing expertise, administration skills and personal attributes needed to deal with clients and to run tourism businesses competitively (Eagles & Bowman 1999; McKercher & Robbins 1998; Page 2003; Sectur 2001). Combined with limited access to funds for training, supplies, infrastructure and vehicles, the barriers for developing ecotourism can become insurmountable. Such barriers increase the need for outside support and partnerships. This makes local communities vulnerable to exploitation, and increases economic leakage (Scheyvens 1999). Lack of skills can skew the patterns of ownership or control to the benefit of local elites and outside companies, who have the resources and knowledge to capitalize on the ecotourism opportunities (Crandall 2002). In such instances, the socioeconomic benefits local communities receive are generally limited to unskilled labor jobs, some farming and food production, and small scale profits from handicraft production (Eagles & McCool 2002). Belize is a sad example, where most ecotourism ventures are owned and operated by expatriates. This situation exists despite the fact that ecotourism since 1982 has been a national government strategy for community development (Munt 1997). Critics also point out that while training appears to be the best way to help local communities develop more economically viable ecotourism operations (Wearing 1999), many training programs have had a fundamental lack of emphasis on all the business-related and financial aspects of ecotourism (Eagles & McCool 2002)
Table 4).
Table 4: Focus of Community Based Ecotourism Capacity Training Programs Conducted by NGOs or Government Agencies.

<table>
<thead>
<tr>
<th>Elements emphasized</th>
<th>Not Emphasized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guide Training</td>
<td>Economic feasibility/市场 studies</td>
</tr>
<tr>
<td>Language skills</td>
<td>Business Planning</td>
</tr>
<tr>
<td>Carrying capacity studies</td>
<td>Marketing</td>
</tr>
<tr>
<td>Basic infrastructure (trails, camps)</td>
<td>Product Development</td>
</tr>
<tr>
<td>Simple Brochures</td>
<td>Hospitality training</td>
</tr>
</tbody>
</table>

Source: Eagles 2002

- **Poor Product Diversification** - Sporadic economic return is also caused by a lack of diversified tourism activities (Spalding 1999). Case studies indicate that ecotourism destinations often become more attractive to visit when there is a whole array of activities to choose from (Buckley 2003; Kotler, Haider, & Rein 1993; Page & Dowling 2002). Adding more products and services to existing activities can help increase visitor numbers, encourage tourists to spend more time at the location and possibly extend the tourism season (Swarbrooke 1998). However, diversification can be risky if it requires large new investments in equipment or if vendors need new skills to conduct the activities (Kotler 2002). Ecotourism vendors and operators are usually small businesses that do not have a lot of resources to take such risks (Thomas 1998). They need to concentrate their efforts where they can achieve the most important goals. It takes a great deal of discipline to pass up apparent (as opposed to real and related) opportunities and stick with well conceived and proven business opportunities (Kotler, Haider, & Rein 1993).

- **Seasonality** - Local tourism operators and vendors in biosphere reserves with seasonal attractions such as migrating wildlife often face difficulties in making a living solely from ecotourism (Scheyvens 1999). Finding ways to overcome the problem of seasonality can be tough especially in reserves where diversification is challenging. However, the economic rewards for doing so can be enormous because of the prospects of more visits, a better spread of visits, full employment as opposed to part-time employment and better utilization of existing equipment (Jefferson & Lickorish 1991).

- **Poor Government Regulations** - Tour operators and local vendors must operate in a regulatory and legal framework that supports the development of ecotourism activities (Ross & Wall 1999). High government taxes, licensing requirements, cumbersome legal paperwork and unclear rules concerning the rights to conduct ecotourism activities can make it very difficult to operate and expensive to start up ecotourism ventures (Lew 1998).
• **Competition** - The economic viability of tourism vendors and operators is also tied to the number of companies offering such services. Too many vendors can make it impossible for anybody to make a living (Dedina 2000a), while too few are likely to stagnate development and concentrate economic benefits in the hands of a few. Lack of competition also has the effect of removing pressure for future development and market adaptation (Kotler, Haider, & Rein 1993).

**Possible indicators:** of economic viability and health of local ecotourism industry include: (i) Profitability, sales/ revenues, (ii) operating costs, and (iii) debt rates. However, such data are often too sensitive to obtain from most operators. In such cases, a number of supply and demand indicators can be used as proxies. These include: (a) growth/decline in visitor numbers; (b) number of new tourism businesses and bankruptcies; (c) number of locals working in tourism related jobs, diversification of tourism products, and visible investments in infrastructure and marketing. Table 5 provides a summary of potential indicators and the environmental, economic and social impacts they address.
Table 5: Possible Positive and Negative Impacts from Ecotourism on Local Communities in Biosphere Reserves

<table>
<thead>
<tr>
<th>Environmental Indicator</th>
<th>Desirable Positive Impact</th>
<th>Undesirable Negative Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biodiversity</td>
<td>Conserves wildlife and vegetation</td>
<td>Increased threats to biodiversity</td>
</tr>
<tr>
<td>Habitat</td>
<td>Restores and preserves habitat</td>
<td>Fragments and destroys habitat</td>
</tr>
<tr>
<td>Ecological Processes</td>
<td>Preserves integrity of biological system</td>
<td>Threatens integrity of biological processes</td>
</tr>
<tr>
<td>Creates Incentives for Conservation</td>
<td>Generates income for impact management, alternative community income, and increased environmental awareness</td>
<td>Speeds up undesired growth, overexploitation of existing resources, and community indifference towards the environment through lack of benefits.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Economic Indicator</th>
<th>Desirable Positive Impact</th>
<th>Undesirable Negative Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment</td>
<td>Locals benefit from new skilled, full-time and well paid jobs</td>
<td>New jobs are seasonal, low skilled, poorly paid or occupied by outsiders</td>
</tr>
<tr>
<td>Salaries</td>
<td>Income gains</td>
<td>Income loss</td>
</tr>
<tr>
<td>Biosphere Management Funding</td>
<td>Ecotourism revenues pays for tourism management cost</td>
<td>Tourism income cannot cover tourism management costs</td>
</tr>
<tr>
<td>Foreign Exchange</td>
<td>Significant</td>
<td>Insignificant</td>
</tr>
<tr>
<td>Leakage</td>
<td>Tourism spending is reinvested in the community</td>
<td>Most tourism spending flows out of the biosphere reserve</td>
</tr>
<tr>
<td>Opportunity Cost</td>
<td>Ecotourism does not conflict with traditional resource use</td>
<td>Ecotourism adds cost to other sector(s) of the economy</td>
</tr>
<tr>
<td>Viability of Local Tourism Operators and Vendors</td>
<td>Profitable and growing</td>
<td>No diversification of local economy; bankruptcies and stagnation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Socio-cultural Indicator</th>
<th>Desirable Positive Impact</th>
<th>Undesirable Negative Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultural Heritage/Values</td>
<td>Increased ethical awareness: strengthens community traditions; increases pride/self-esteem; encourages local manufacturing</td>
<td>Breakdown of local culture, religion, traditions; imposition of foreign/ alien values; jealousy, apathy</td>
</tr>
<tr>
<td>Community Capacities and Skills</td>
<td>Improved intercultural understanding; apprehension of foreign languages; employees are adopting new skills: increased education level of locals</td>
<td>Loss of traditional knowledge and jobs</td>
</tr>
<tr>
<td>Income Distribution</td>
<td>Widely shared income distribution in the community</td>
<td>Foreigners or local elite are the only beneficiaries</td>
</tr>
<tr>
<td>Changes in Political/Economic System</td>
<td>Strengthened local participation; enhanced democratic structure of local institutions; increased status for lower minority groups</td>
<td>Erosion of local control; Marginalization of certain stakeholders</td>
</tr>
<tr>
<td>Attitude Towards Tourists</td>
<td>Visitors are welcome</td>
<td>Resentment and hostility towards visitors</td>
</tr>
<tr>
<td>Land and Resource Access</td>
<td>Possible resource use conflicts become fewer and resolved</td>
<td>Reduced access to resources; forced migration of residents; conflict over land uses</td>
</tr>
<tr>
<td>Community Demographics</td>
<td>Economic opportunities hinders outflow of local inhabitants</td>
<td>Population grows uncontrolled as outsiders are attracted for employment</td>
</tr>
<tr>
<td>Promotes Spiritual/Existence Values</td>
<td>Establishes attractive environment for residents and visitors, which may support other compatible new activities</td>
<td>Destruction of aesthetic, spiritual and other values related to well-being</td>
</tr>
<tr>
<td>Environmental Awareness</td>
<td>Increased environmental education and awareness for visitors and locals</td>
<td>Indifference towards environmental degradation</td>
</tr>
<tr>
<td>Living Standards</td>
<td>Improved services, facilities, infrastructure</td>
<td>Higher cost of living (Inflation, real estate speculation etc.)</td>
</tr>
<tr>
<td>Desirable/Undesirable Activities</td>
<td>Better community compliance with management rules</td>
<td>More crime, poaching, noise, and congestion</td>
</tr>
<tr>
<td>Ownership over Resources</td>
<td>More local ownership and rights</td>
<td>More foreign ownership and outside control</td>
</tr>
</tbody>
</table>

Sources: (Buckley 2003; Crandall 2002; Diamantis 1999; Eagles & McCool 2002; Fennell 2003; IUCN 1998; Page 2003; Pizam & Milman 1984; Ross & Wall 1999; Scheyvens 1999; Sharpley & Telfer 2002)
2.7 Summary of Literature Review

Many biospheres in Mexico are threatened from human activities and encroachment. In an effort to counter these threats, ecotourism is increasingly seen as an important tool to balancing development with conservation. Mexico's biosphere reserves are in a strong position to benefit from such development since ecotourism is expected to continue to grow rapidly and most of its activities can take place within protected areas. Furthermore, Mexico's biosphere reserves have a number of features that makes them very attractive as ecotourism destinations. These includes the presence of a high concentration of biodiversity; cultural history; unique geography of areas; close proximity to the US tourism market, as well as, in place infrastructure available to support ecotourism development. Unfortunately, the few available case studies from ecotourism development in Mexico illustrate that ecotourism is difficult to implement successfully.

To suggest that one single factor is likely to be the cause of success or failure of ecotourism is simplistic. There are likely to be several factors which are interrelated and site-specific. Typically, negative environmental impacts in biosphere reserves are symptoms of: uncontrolled growth and poor management; a lack of community participation; inappropriate laws and institutions; a lack of reserve funding; and insufficient staff to enforce and monitor rules. A lack of socio-economic benefits is caused by local failure to profit from ecotourism opportunities due to limited: investment capital; experience; skills; management support; business oriented training and infrastructure. However, the capacity to attract visitors and thus generate socioeconomic benefits is also dictated by a number of exogenous factors related to the characteristic of the reserve itself. These include the natural quality of the reserve; the geographic location; and the perceived safety of traveling there.

The strategies needed to mitigate negative environmental and socioeconomic impacts are different with the context. Negative environmental impacts can be mitigated by management policies and activities that reduce the use of the entire protected areas and modify the use of problem areas; adjust the timing of use; alters the type of use, modifying visitor behaviour; or rehabilitating impacted areas. On the other hand, minimizing the negative socioeconomic impacts is a question of empowering local people to benefit more from the development of ecotourism activities. This implies involving reserve residents actively in the design of tourism rules and regulations to address local needs better. It also involves capacitating local people with the necessary business skills to take advantage of the new possibilities, and minimizing the leakage of tourism spending out of the reserve. Successful community-based ecotourism requires a level of business specialization and marketing expertise that often goes beyond the skills and financial capabilities of most community members.
3 Research Objectives

The main objectives of this study was to examine: 1) how the ecotourism operations and activities in the Laguna San Ignacio have changed since 1994, 2) whether these changes have made ecotourism a more viable socio-economic development alternative for the communities, and 3) what strategies may be useful in overcoming identified barriers to further socio-economic benefits from ecotourism activities. This examination was carried out from the perspective of the local tourism operators.
4 Methods

To address these objectives a descriptive case study method was chosen. This was an ideal method because a holistic, in-depth, and flexible approach was needed for understanding the complex linkages and interactions between stakeholders and events through time. (Feagin, Orum, & Sjoberg 1991). Because the project emphasized exploration rather than prescription or prediction, this approach provided this investigation with greater freedom to discover and address issues as they arose in the field. In addition, the looser format of the case study research allowed the researcher to begin with broad questions and narrow the focus as the research progressed rather than attempting to predict every possible outcome before the investigation was conducted (Tellis 1997). The case study method was also suitable as it was difficult to use predetermined statistical analysis or quantitative tools for measuring or describing certain events.

The research involved four phases as outlined by Figure 3. Each phase is discussed in more detail in the following paragraphs.

Figure 3: Structure / Phases of Research

Source: Peter Rossing Agersted
4.1 Research Phases

First Phase - Design of Case Study

The purpose of this phase was to outline the context and rationale necessary for the investigation. A literature review was carried out to identify success criteria for implementing ecotourism in Mexico's biosphere reserves. The findings from this review were used to develop a framework of indicators that could be used to address the research objectives, and structure the data collection.

Indicators have been found to be an effective means for site-evaluations, provided they are practical; can establish trends; measure temporal and spatial variation; and are relevant to a valid conceptual framework (Kreutzwiser 1993). Various indicators exist to assess and monitor the socio-economic impacts of ecotourism. For the purpose of this case study, the use of socioeconomic indicators was found to be the most suited for evaluating the existing situation in LSI. This was because of:

- The desire to take into account not only economic, but also social factors;
- The difficulties of interviewing respondents of LSI using formal questionnaires; and
- The need to measure changes through time.

A total of 34 indicators were developed to reflect issues specific to ecotourism development and related socioeconomic changes in LSI. These indicators were grounded in the theoretical context of the literature review. They were informed by existing studies, reports and management plans from LSI. The criteria addressed issues relate to:

- Economic benefits to local people and the management of the Reserve (Wallace 2002; Wells & Brandon 1992; Wood 2001a)
- Participation of local people in decision-making processes that determine the kind of ecotourism that should occur (Crandall 2002; Scheyvens 1999)
- Community cohesion and identity (Crandall 2002; Scheyvens 1999)
- Local support for the biosphere reserve (Brandon 1996; Eagles & Bowman 1999)
- The viability of tourism operations (Eagles & Bowman 1999; Wallace 2002)

Table 6 shows the indicators used for the project as well as the method of data collection used to address them. The next section provides a more elaborate description of these.
Table 6: Indicators Used for the Assessment of Ecotourism Changes in Laguna San Ignacio between 1994 and 2002

<table>
<thead>
<tr>
<th>Improvement of (or change in the level of) the Economic Benefits to Local People and Management of the Reserve</th>
<th>Method of Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Changes in Visitor Numbers</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in Ecotourism Revenue</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Growth in Ecotourism Employment</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in Types of Ecotourism Employment</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in the Local Share of Ecotourism Jobs</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in Local Ecotourism Salaries Compared to Local Fishing Income and Other Regional Salaries.</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Displacement of Traditional Jobs Caused by Ecotourism Development</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Increases in the Contribution of Ecotourism Revenue to Biosphere Management Funding</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in the Presence of Staff Delegated to Community Relations Tasks</td>
<td>Ssi, Lit, Obs</td>
</tr>
<tr>
<td>• Changes in Management Efforts to Capacitate Local Ecotourism Development</td>
<td>Ssi, Lit, Obs</td>
</tr>
<tr>
<td>• Changes to the Number of Effective Local Institutions to Deal with Tourism Issues</td>
<td>Ssi, Lit, Obs</td>
</tr>
<tr>
<td>• Implementation of Local Ideas in Area Management Plans, Tourism Activities and Legislation</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Local Involvement with the Enforcement of Ecotourism Rules and Regulations</td>
<td>Ssi, Lit, Obs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Improvement of Community Cohesion and Identity</th>
<th>Method of Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Level of Conflicts between Traditional Uses and Ecotourism Development</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Level of Conflicts over Availability of Tourism Licenses</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in Conflicts over Ownership of Land with Tourism Possibilities</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in the Number of Women Involved in Ecotourism Development</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in the Tour operators’ Perception of their Relationship with Visitors</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• The level of Ecotourism Revenues Being Reinvested back into Community Development Projects</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in the Number of Items and Services Purchased Locally</td>
<td>Ssi, Lit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Changes in Local Support for the Biosphere Reserve</th>
<th>Method of Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Changes in the Local Acceptance of the Biosphere Reserve</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in the Educational and Interpretive Experiences for Locals</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in the Local Efforts to Participate in Conservation Actions</td>
<td>Ssi, Lit</td>
</tr>
</tbody>
</table>
Table 6 continued......

<table>
<thead>
<tr>
<th>Change in the Viability of Local and Regional Tour Operators</th>
<th>Method of Data Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Changes to the Tour Operators’ Number of Employees</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes to the Tour Operators’ Number of Visitors</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in the Tour Operators’ Revenue</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in the Tour Operators’ Profitability</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes to the Tour Operators’ Services and Infrastructure</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes to Tour Operators’ Diversification of Ecotourism products</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes to Tour Operators’ Promotional Activities</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes to Tour Operators’ Sales and Distribution Channels</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Visitors Perceptions of Whale Watching Tours in LSI</td>
<td>Ssi, Lit, Obs</td>
</tr>
<tr>
<td>• Changes in the Skills of Tourism Operators</td>
<td>Ssi, Lit</td>
</tr>
<tr>
<td>• Changes in the Tour Operators’ Efforts to Educate and Inform Visitors about the Environment</td>
<td>Ssi, Lit, Obs</td>
</tr>
</tbody>
</table>

Sources of data collection:
Ssi = Semi structured interview
Lit = Literature
Obs = Observation

Second Phase - Conduct of Case study

The objective of this phase was to use the developed framework of indicators to collect data on the case study of LSI. Several qualitative research methods were used for data collection. More specifically the project consolidated existing secondary data from previous published literature and undertook new primary data collection to fill in related gaps. The secondary data were collected through archival/library research. They were derived from existing studies, surveys, reports and management plans concerning LSI, as well as other relevant context-setting literature related to whale watching, subsistence communities, and management of protected areas in Mexico. Additional website information was gathered during the same period from governmental, NGO and tour operators with a stake or interest in LSI.

From March-June 2002, fieldwork was conducted at LSI in Baja California Sur. This period was chosen because it coincided with the peak of the whale watching season in LSI. The timing of this work increased the opportunities to speak with the areas most important ecotourism stakeholders and interview whale watching visitors. Interviews were also conducted elsewhere in Baja California and California to talk to researchers, foreign tour operators and government officials with knowledge or interests pertaining to LSI. Methods for primary data collection included:
Semi-structured Interviews with Relevant LSI Stakeholders - In pre-arranged settings, semi-structured were conducted with 32 individual stakeholders. Questions were based on the indicators shown in figure 2. Most interviews lasted from 35 to 60 minutes. Stakeholders were identified using a non-probability method of sampling known as purposeful or criterion-based sampling (Burns 2000). It involved the non-random selection of “information-rich cases”, according to the presence of certain criteria as defined by the researcher (Patton 1990). These stakeholders included:

- 11 people from four local tour operators and a Californian operator;
- 5 representatives from government agencies (national, regional and local) involved with tourism and the management of the LSI reserve;
- 5 stakeholders from local community organizations, cooperatives and communities (tourism and fisheries);
- 4 NGO members involved with community development and gray whale conservation (local and international);
- 6 researchers with specific knowledge pertaining to the environmental, socioeconomic and managerial issues in the communities of LSI

Focus Group Discussion with Local Tourism Operators - On June the 23rd, 2002 in LSI, a 2 hour long meeting was held with members the local tourism union (ARIC). It was designed to discuss issues and ideas related to future development of ecotourism activities in the area. Representatives from 4 local whale watching companies participated.

Observations of Local Whale Watching Operations/ Tourist Behaviour. Participant observation of whale watching and other community-based activities also formed a small, but significant part of the field research. Overall, 15 trips were conducted with several of the local tour companies. Before, during and after these trips tourists were asked informally to state their opinions about their whale watching experience in LSI.

Direct Observation - Living in the community of LSI for a period of almost two months provided a unique possibility to observe the use of LSI’s tourism related infrastructure and facilities. It also offered insights into how various stakeholders were interacting with each other. This approach helped validate the degree to which attitudes towards ecotourism development (as expressed through interviews, expert opinion and literature) were consistent with what was observed first-hand during the personal participation.
Figure 4 illustrates how each method contributed data toward the assessment of the five different categories of indicators.

**Figure 4: Linkages between used Data Collection Methods and Indicators**

Source: Peter Rossing Agersted.

**Third Phase - Analyze the Case Study Evidence**

To analyze how ecotourism activities in the Laguna San Ignacio have changed since 1994, several of the indicators were employed. The year 1994 was chosen as a baseline point for evaluating ecotourism impact, because it was:
- the last year of most published and available data on ecotourism in LSI; and
- the beginning of significant transitional changes in LSI (e.g., the restructuring of Mexico's environmental institutions, the publication of the first management plan for El Viscaino Biosphere Reserve and increased presence of NGOs conducting community work within LSI).

**Fourth Phase - Conclusion, Recommendations and Implications**

The fourth phase of this research provided different strategies for overcoming identified barriers to enhanced future ecotourism activities in the LSI biosphere reserve. From the perspective of the management of biosphere reserve general strategies to create and strengthen local tourism activities were developed (Briggs 2000; Kotler 2002; Witt & Moutinho 1994). These included approaches to:
- Increasing economic benefits to the local people and the management of the reserve;
- Improving the participation of local people in the decision-making process concerning ecotourism activities;
- Enhancing local community cohesion and identity;
- Advancing local support for the biosphere reserve; and
- Increasing the viability of local and regional tour operators.
4.2 Project Scope and Limitations

From the onset, the investigation was bounded by a number of important restrictions set by the scope, methods and the characteristics of LSI as a case study area.

Defining Local, Regional and Foreign Ecotourism Stakeholders

Most inhabitants in LSI are recent immigrants. Some only live in the lagoon temporarily during the fishing season. Others own land in the lagoon and make a living solely from activities in the area, but live in the neighbouring town of San Ignacio which is 65 km away. Defining local stakeholders therefore becomes blurred as it depends on the criteria used. In this report "locals" were defined as someone residing, working or located in LSI permanently, while "regionals" referred to people and companies which were based out of the neighbouring communities of San Ignacio, Santa Rosalia and Aqua Verde. The term ‘foreign’ was similarly used to describe the camps and the liveaboards that were owned and operated from head quarters outside Mexico.

Using a Case Study and Indicator Based Framework

"The case study has long been stereotyped as the weak sibling among social science methods," and is often criticized as being too subjective and even pseudo-scientific (Yin 1994). Opponents cite opportunities for subjectivity in the implementation, presentation, and evaluation of case study research. The approach relies on personal interpretation of data and inferences. Results may not be easy to generalize, are difficult to test for validity, and rarely offer a problem-solving prescription. Simply put, relying on one or a few subjects as a basis for cognitive extrapolations runs the risk of inferring too much from what might be circumstance (Tellis 1997). To minimize these challenges, this study used multiple sources of evidence (e.g. documents, direct participant observation in addition to semi-structured interviews) to address the objectives and the developed framework of indicators. This form of data triangulation, helped to strengthen the validity of the data collected from case studies. (Decrop 1999).

Most of the information collected was qualitative in nature. This can be seen as a drawback to the strength of the economic evidence presented in this study. However, the choice of indicators could not have been much different considering the limited baseline of economic statistics related to ecotourism development in LSI prior to 1994.

Protection of the Tourism Stakeholders’ Confidentiality

Keeping the identity of the local tourism stakeholders anonymous in the analysis was a necessity due to the sensitivity of some of the business information. To protect confidentiality companies that sold package tours were compared with the ones that did not. This made it possible to lump the most sensitive
data together and protect the various tourism operators’ confidentiality without losing too much of the data’s relevance.

Reluctance to Participation
An issue that was considered carefully in the design of this research was how to approach and interview people in LSI. From previous research conducted by others, it was noted that the local inhabitants were suspicious of the use of standardized questionnaires and tape recorders (Dedina 1996; Young 1995a). LSI is a community where there are considerable social tension among different stakeholders due to unresolved land tenure issues (Dedina & Young 1995). Extra caution therefore had to be exercised in dealing with these sensitive issues. Interviewed respondents were alerted beforehand about the purpose of the study, as well as the types of questions that would be presented to them. Following the ethical guidelines set out by University of British Columbia, respondents were also advised that they had the right to refuse to answer. They were also told how the information was going to be used.

A factor that helped establish the necessary trust with the communities was the researcher’s job as a volunteer for the NGO Wildcoast, a California based organization working mostly with turtle conservation in Mexico. I was working actively with community members to exchange their old outboard engines for newer more efficient ones. As a result, the community informants reacted positively to my questions. This situation was not perceived to influence the objectivity of the study since the outboard engine project played a small, role in the data collection.

Socio-economic Impact Focus
The scope of this case study investigation focuses only on socioeconomic impacts. This limitation is justified because a recent UN environmental impact assessment of LSI was conducted in 1998. It concluded that the current level of ecotourism activities posed no threats to the ecological integrity of the lagoon. The area’s natural resources remain in a pristine condition, except for its fisheries resources (UNESCO 1998).

Calculations of the Economic Benefits from Ecotourism Development in LSI
Estimating the economic benefits from ecotourism development was done using the same assumptions and methods used by Young in 1994. This was perceived to be the most feasible way to compare figures from 1994 with 2002 in light of the tourism operators’ reluctance to disclose precise financial data. The crude nature of the calculations and nature of the assumptions, however, weakened the validity of the economic analysis.
Evaluation of Strategies

One research objective was to identify general strategies that may be useful in overcoming identified barriers to further socio-economic benefits from future ecotourism activities. The suggested strategies are only analyzed very little in terms of viability and feasibility; or with reference to other biosphere reserves and case studies. To do so would require empirical research and work way beyond the scope of this study. A more in-depth analysis is, however, included as an appendix for evaluating the economic advantages of changing the tourism operators two-stroke outboard engines with new four-stroke ones.

Representativeness

Direct observations of whale watching activities conducted by some of the foreign tour operators were underrepresented in this study. They were not in LSI when the fieldwork was conducted. Some of their perspectives were collected through email, telephone conversations and visits to the U.S. Likewise one of the five local tourism operators was unavailable for interviews due to more important family matters. Due to budget and time constraints, it was not possible to talk with any government officials from managing agencies based in Mexico City. Since most management decisions and actions concerning tourism in LSI are the responsibility of the Reserve’s headquarters in Guerro Negro, information from Mexico City government agencies was not expected to yield new information.
5 Introduction to the Case Study of Laguna San Ignacio

This section introduces the case study area of Laguna San Ignacio in terms of its biophysical, human habitation and ecotourism development characteristics. Special focus is placed on how resource use patterns have changed from fisheries towards ecotourism activity; the significance of LSI as a whale watching ecotourism destination; and the issues that have arisen with this development.

5.1 Location

Laguna San Ignacio is located on the Pacific Coast of Baja California Sur, Mexico in the municipality of Mulege. It is situated approximately 700 kilometers (km) south of the U.S-Mexico border. Originally established along with the neighbouring lagoon Ojo de Liebre as a migratory bird refuge, it was declared a whale refuge and a maritime-tourist attraction in 1979 (SEMARNAP 2000). In 1988, a new biosphere reserve was created. It included all of Laguna San Ignacio as well as the surrounding desert areas - a total area of more than 2.5 million hectares. Called the Vizcaino Biosphere Reserve, it is the largest reserve in Latin America (Dedina & Young 1995).

Figure 5: Laguna San Ignacio’s location in Baja California Sur, Mexico
In 1993, UNESCO recognized the exceptional value of Laguna San Ignacio as a sanctuary for grey whales and designated it as a World Heritage Site (Ortega-Rubio 1998). The 80,000 hectare (ha) lagoon forms the southern boundary of the Vizcaino Desert. It is one of the most arid deserts in North America (SEMARNAP 2000). Three mountain ranges surround the lagoon: the Sierra de Santa Clara to the north, the Sierra de San Francisco to the northeast, and the Sierra de Guadalupe to the southeast. Laguna San Ignacio is divided into northern and southern sections or "arms" and contains three entrances to the Pacific Ocean. Two barrier islands protect the lagoon from the open ocean (Dedina & Young 1995).

Relatively isolated, the nearest town, San Ignacio, is located approximately 68 km to the northeast of LSI (Figure 6). A badly maintained dirt road made in the 1970s connects the isolated lagoon with the date-palm oasis and old Spanish mission site of San Ignacio and Highway One. This is the main north-south road in the peninsula (Young 1995a). A series of poorly marked, intersecting tracks pass southward through salt flats and sand dunes, connecting Laguna San Ignacio to San Juanico, Ciudad Insurgentes, and Highway One via a dirt road approximately 170 km to the south. A dirt road passes northward to the fishing community of Punta Abreojos. Laguna San Ignacio also has a primitive landing strip built. This was built in the 1980s when fishing for clams was at its highest level of economic importance (Dedina & Young 1995).

Figure 6: the Main Gateway to Laguna San Ignacio is the Town of San Ignacio 70 km to the Northeast
5.2 Biological Significance of Laguna San Ignacio

Considered one of the most biologically important areas of the northwestern Pacific Ocean, LSI is part of the largest remaining undisturbed coastal wetlands in Mexico (SEMARNAP 2000). The surrounding landscape and coastline is of exceptional beauty and contains salt flats that are unique to the coast of Baja. Inland columnar cacti, barrel cacti, saguaros, chollas, cardons, and pitayas are among the more than eighty species of Cactaceae that form a continuous mosaic of some of the most pristine desert found in the world (SEMARNAP 2000). Likewise the littoral zone of the lagoon plays a key role in sustaining a rich marine and bird life (Dedina 1996) in LSI:

- Is one of only three remaining lagoons on the Pacific coast where the grey whales (after their yearly migration from the cold waters of Alaska) find the optimum conditions for nursing and calving. More than half of the world's gray whales calves are born inside the protected waters of Laguna San Ignacio and the neighbouring lagoon of Ojo de Libre (SEMARNAP 2000). LSI has played a crucial role in bringing the grey whales back from near extinction in the late 1940s to a healthy stock of approximately 27,000 animals in 2000 (Dedina 2000a).

- Serves as a significant feeding grounds for various species of resident and migratory marine wildlife such as the bottlenose dolphin (Tursiops truncatus), California sea lion (Zalophus californianus), black sea turtle (Chelonia agassizii), and green sea turtle (Chelonia mydas) (SEMARNAP 2000).

- Is located in the westernmost strand of the Pacific flyway for migratory birds. 70,000 shore birds visit each year to feed, rest, and breed. Overall, 221 species have been observed in Laguna San Ignacio (SEMARNAP 2000).

- Has shallow water that make it an important hatchery and habitat for commercially valuable fish and shellfish like broomtail grouper (Myceremperca zenarcha), California halibut (Paddlefish californicus), shortfin corvina (Cynoscion parvippinnis), sierra (Scornhemmorus sierra), lobster (Panulirus spp.), abelone (Haliotus spp.), and Pacific calico scallop (Argopecten circularis). The southern shoreline near El Delgadito contains one of the most significant areas for the harvest of Pismo clams (Tivela stultorum) along the Pacific Coast of North America (SEMARNAP 2000).
5.3 Laguna San Ignacio's people and settlements

Little is known of the indigenous people that once exploited the near shore waters in LSI. They were virtually wiped out by diseases brought by early European contact and colonization (SEMARNAP 2000). In the mid 18th century, whalers from first the United States and then Europe were the most frequent visitors. As a consequence, whales became so scarce in the lagoon by the 1920s that whaling was abandoned (Dedina 1996). Starting in the 1930s, pioneer settlers migrated seasonally inland from drought-parched ranches to harvest lobster, shark and sea turtles. This was done for subsistence and for sale to merchant ships from San Diego (Dedina 1996). In the 1970s and 80s the human population of the area grew rapidly. Many people settled in LSI. They came from the interior of Mexico seeking jobs in the emerging scallop industry. Demographic statistics reflect these changes. The resident population increased from 26 to 506 people between 1970 and 1995 (Dedina & Young 1995).

The scarce and sporadic rainfall (less than 50 mm annually); hot summer temperatures, intense winds, depleted soils, lack of infrastructure and limited fresh water are constraints that have kept LSI one of the remost, least populated and developed areas in Mexico (Dedina & Young 1995; SEMARNAP 2000; Young 2001). In 1995 there were no basic services like drinking water, stores, sewerage, electricity, telephone, policing or proper roads. Living in LSI was hard, as locals existed without most modern conveniences. They also spent considerable effort and money to bring portable water, propane, and food products to LSI from San Ignacio and surrounding ranches (Dedina & Young 1995). Locals often refer to the area as the zone the government abandoned.

Today LSI's five human settlements (La Laguna, La Base, La Fridera, Ejido Luis Echeverria and El Cardon) are home to approximately 60 families of about 300 people (SEMARNAP 2000)\textsuperscript{4}.

\textsuperscript{4} Two other settlements, Boca de los Cardones and El Delgadito are located in the southern end of the lagoon. However, as these communities feels little affiliation with LSI, are physically poorly connected, belongs to a different political municipality and have no ecotourism activities they were not included in this study.
These settlements are highly heterogeneous. Rapid habitation and population growth in LSI has translated into a lack of community cohesion (Young 1999c). The inhabitants of LSI are divided into three highly polarized groups defined by their place of origin, education, income level, resource use and political influence (Dedina & Young 1995):

- **Families of the original settlers** live in the three oldest settlements. Each settlement averages 5 households. They are La Laguna, La Base and La Fridera (SEMARNAP 2000). They share close family ties and values, and have lived in the lagoon since the early 1920s (Young 1999c). These people make a living from a combination of tourism and fishing and reside in rudimentary brick houses. Few of them have a formal education. Historically, few of these residents have been
members of the local ejido\(^5\) named Ejido Luis Echeverria that oversees communal land. Until 1995 most land was either communal or federally owned. The families of the original settlers has traditionally had little political influence over resource development in the lagoon (Young 1999c). Nevertheless, having lived in the area prior to the establishment of both the Ejido and the Reserve, their right to live inside the coastal zone is recognized by the management of the Reserve (Sanchez 2002).

- **Impoverished rurals from mainland Mexico** are those temporary workers, who came to seek jobs in the seasonal scallop fisheries during the 1980s. Many of those have settled permanently in approximately 30 households in the fish camp of El Cardon (SEMARNAP 2000). This group live illegally inside the coastal zone of federal and Ejido owned land. Permanent habitation is prohibited in this area. Most of these inhabitants are poor and have little formal education (Young 2001). Their low income status is reflected in a deficiency of appropriate housing. Many houses are constructed from plywood, cardboard, plastic tarps, driftwood and even old truck freezer compartments (Dedina 2000a). The transient nature of this community, combined with illegal poaching and drug smuggling activities have given this settlement a reputation of lawlessness (Dedina & Young 1995). Some of these residents have recently moved to the planned community of Ejido Luis Echeverria, located two km inland from El Cardon. As of 1995 this group had almost no involvement in tourism activities (Dedina & Young 1995).

- **Educated professionals from Mexico City and La Paz living in San Ignacio** represent a small group of people who came to LSI in the 1980s as part of a government project to provide technical assistance and training to local fishing cooperatives (Young 2001). After the government program ended, they settled in San Ignacio, and worked in the lagoon to set up a small-scale aquaculture project. They also built the first (and only) primary school in Laguna San Ignacio with federal funds, and founded a gray-whale tourism company. Highly organized, skilled and innovative, this group became the most powerful entity in the lagoon when they gained control with the local ejido organization in 1985. Their power is based on a good relationship with management and a highly advantageous whale watching permit (Young 1999a). Considerable tension emerged between these people and the other inhabitants of the lagoon when they obtained the legal rights to already settled land in El Cardon and La Laguna, La Base and La Fridera in 1995.

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\(^5\) *Ejido* – Organization overseeing the communal lands granted by the Mexican government.
5.4 Resource Use

Small scale fishing, aquaculture and tourism represent the most important economic activities in the lagoon. However ecotourism has been growing in economic importance, while fishing activities have become increasingly unprofitable due to rising costs and declining fishing stocks.

5.4.1 Fishing and Aquaculture

In 1995 fishing was the most important source of income for most of the lagoons inhabitant. Typical to other parts of coastal Baja, fishers work independently or as members of local cooperatives using small skiffs with outboard motors, gill nets and diving equipment. As in other parts of Mexico it is mostly men who participate in fishing activities (Young 2001; Young 1999b).

Throughout the 1980s, LSI saw a vast overexploitation of some of its most valuable fisheries resources. Outside entrepreneurs in the state capital of La Paz used their political ties to gain control of local scallop fisheries throughout the state. Using a mobile workforce consisting of temporary and impoverished workers from the mainland of Mexico, as many as a 1,000 people would come to LSI seasonally to harvest scallops indiscriminately around the clock (Young 1995a). In less than the five years, the Pacific calico- and fan scallops went commercially extinct, as there was little enforcement and no incentives to protect the resource (Arizpe C. 1992; Maeda M. 1990; Reyes S. 1990).

Picture 1 Hundreds of Piles of Pacific Calico- and Fan Scallops Scattered in the Lagoon Tell a sad Story of Overexploitation in LSI during the 80s
In the 90s a cooperative began a small-scale Pacific calico scallop and oyster aquaculture project near El Cardon. However, by 1995 this venture was constrained by finding available seed stock; lack of investment capital; a small market with few buyers; and the highly fragile nature of growing the Pacific calico scallops (Dedina & Young 1995).

Unfortunately, during the 1990s fishing activities had still has not recovered from the collapse of the 1980s. Fishing operatives were barely breaking even. This not only resulted in economic hard ship, but also increased the level of social tension among the different resident groups of LSI. In addition, beginning in the 1990s there was an increased level of illegal poaching of sea turtles and abalone, and LSI was being used as part of a drug trafficking corridor (Dedina & Aridjis 2002). By 1995 most lagoon residents were sceptical that fishing would become economically feasible again as:

- commercial stock showed no sign of recovery;
- fishing costs were increasing; and
- market prices remained low

5.4.2. Ecotourism
Ecotourism in Laguna San Ignacio mainly focuses on watching the gray whale (Eschrichtius robustus). The season extends from December 15 of one year to April 30 of the next. During that period whales visit the lagoon as part of their yearly migration between Alaska to Mexico. Tours typically take place in small open 7m skiffs with outboard engines that can accommodate a maximum of ten people at a time. Whales are usually spotted less than 25 minutes from where the boats are launched. Tours typically average 2-2.5 hours in duration. A number of features have made LSI one of the world’s most unique places to watch these whales:

- Rides to see the gray whales are very comfortable as waters are sheltered from the open ocean by barrier islands. These calm waters enable visitors to see the whales much better and more comfortable that what is normally possible on the ocean.

- The concentration of gray whales in the lagoon is the largest in the world. It is not uncommon to see as many as 300-400 whales inside the lagoon at certain times. Large pods tend to concentrate in specific shallow waters (Russell 2001).
In LSI, gray whale behaviour can be seen that is rarely observed along the coast of British Columbia, Washington State and California. These behaviours include spy hopping, breaching and mating (Jones, Swartz, & Leatherwood 1984).

Unique to LSI is its “friendly” whales. Attracted by the revving noise of the outboard engines, whales often approach tour boats and allow boat passengers to touch them (Nickerson 1987). Little is known about why the whales enjoy these interactions (Russell 2001). From one interaction with a fisherman in the 1970s, the behaviour has since spread to many individuals. In 2002, the chance of having such an encounter was about 75% per trip (Fischer 2002a). The presence of one friendly whale may also attract others. At times, boats are surrounded by up to twenty curious animals. In many cases, a calf will visit the skiff with its mother so passengers can pet or rub it. In many other instances the whales rub gently against or lift the skiff partially out of the water (Russell 2001). To protect the whales from harassment, the Reserve’s whale watching guidelines stipulate that boats must stay at a minimal distance of 30 m from the whales, except in the cases where the animals choose to come closer (SEMARNAP 2000).

Baja California has the only three lagoons in the world where grey whales nurse and calf. However, only LSI has a landscape that remains almost completely unaltered by man. Its pristine scenery, beauty and demarcation as a World Heritage Site within a biosphere reserve adds to the uniqueness of the tourist experience (Dedina 2000a).

![Picture 2: A Typical Encounter with a “Friendly Whale” in LSI](image)
The History of Whale Watching in LSI

US based tourism companies were the first to bring visitors to see whales in the 1970s. The first visits involved tourism companies that organized nature oriented travel by land in Baja and commercial sport-fishing enterprises from southern California that hired out their boats during the low-fishing season for natural history excursions (Russell 2001). One important aspect of these trips involved going out in small boats to watch the whales. There was limited cultural and economic exchange with locals since all companies brought their own supplies, food, and equipment (Dedina & Young 1995).

This situation changed in the late 1980s, when one of the oldest-established families in the lagoon was contracted to use their fishing skiffs for the purpose of whale watching. Logistically and economically, it made sense for foreign companies to hire locally rather than bring skiffs and boat drivers themselves. Outside companies perceived this move as a good way to build closer ties with the local community (Young 1999b).

In 1991 rules were implemented that forbade fishing inside the whale watching zone during the tourism season (Dedina & Young 1995). As compensation, local inhabitants were granted exclusive permits to work as skiff drivers. Some of the foreign camps and visiting tours boats were initially reluctant to hire locals due to concerns over safety and inadequate training. This changed quickly to a growing appreciation of the skills, knowledge, and experience of local fishers in driving skiffs and observing area wildlife (Young 1999b). The legal requirement to hire locals coincided with a new trend of more Canadian and American tourists arriving overland on their own to see the whales. By 1994, two San Ignacio based and three local and whale watching companies had emerged to provide day tours, camping facilities and home-cooked meals to this growing independent travel market segment (Dedina & Young 1995).

In 1994 LSI, became the centre of prolonged environmental dispute between Baja's largest corporation, ESSA, (a company jointly owned by the Mexican government and the Mitsubishi Corporation) and a worldwide coalition of NGOs (Russell 2001). ESSA was planning to transform 116 square miles of protected area adjacent to San Ignacio Lagoon into an industrial salt production facility (Spalding 1999). In March 2000, Mexico's president Zedillo announced a stop to the salt works on the grounds that it would alter the landscape permanently. The conflict had then reached epic proportions. Approximately 750,000 protest letters had been sent to the Mexican government; numerous prominent Hollywood celebrities participated in whale watching in the lagoon; big mutual fund companies had advised clients...
not to buy Mitsubishi stock, and body guards had been used to protect the leader of “the Group of Hundreds” (Mexico's most prominent environmental group) from death threats (Dedina 2000a; Mader 2000; Russell 2001). With this exposure, LSI went from being a relative unknown whale watching location to one recognized as the most significant and unique place in the world to see the gray whale (Dedina 2000a).

Today five local and regional tourism operators continue to make a living from businesses providing day trips; packages based out of camps; and from servicing the foreign camps and tour boats that operates in LSI. In 2002 these outsourcing services included two foreign camps and nine boats tour boats (liveaboards) (Table 7). These foreign operators were almost all based in San Diego, California during this period.

Table 7: Local, Regional and Foreign Operators Conducting Whale Watching Tours in LSI 2004

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Activities offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecoturismo Kuyima</td>
<td>San Ignacio</td>
<td>whale watching, camping/lodging facilities, outsourcing, food and drinks, and transportation</td>
</tr>
<tr>
<td>Pachico’s Eco Tours</td>
<td>Laguna San Ignacio</td>
<td>whale watching, outsourcing, food and drinks</td>
</tr>
<tr>
<td>Baja Adventure</td>
<td>Laguna San Ignacio</td>
<td>whale watching, camping/lodging facilities, food and drinks</td>
</tr>
<tr>
<td>Antonio’s Eco Tours</td>
<td>Laguna San Ignacio</td>
<td>whale watching, food and drinks, camping/lodging</td>
</tr>
<tr>
<td>Cantil Rey Laguna Tours</td>
<td>San Ignacio</td>
<td>whale watching, transportation</td>
</tr>
<tr>
<td>Baja Discovery</td>
<td>San Diego</td>
<td>whale watching*, upscale camping/lodging facilities</td>
</tr>
<tr>
<td>Baja Expeditions</td>
<td>San Diego</td>
<td>whale watching*, upscale camping/lodging facilities</td>
</tr>
<tr>
<td>Lindblad Expeditions (Sea Bird, Sea Lion)</td>
<td>New York</td>
<td>whale watching*, liveaboards</td>
</tr>
<tr>
<td>Horizon</td>
<td>San Diego</td>
<td>whale watching*, fishing, liveaboards</td>
</tr>
<tr>
<td>Shogun Sport Fishing</td>
<td>San Diego</td>
<td>whale watching*, fishing, liveaboards</td>
</tr>
<tr>
<td>H&amp;M Landing (Spirit of Adventure)</td>
<td>San Diego</td>
<td>whale watching*, fishing, liveaboards</td>
</tr>
<tr>
<td>Royal Star Sports Fishing</td>
<td>San Diego</td>
<td>whale watching*, fishing, liveaboards</td>
</tr>
<tr>
<td>Royal Polaris Sports Fishing</td>
<td>San Diego</td>
<td>whale watching*, fishing, liveaboards</td>
</tr>
<tr>
<td>Pacific Queen Sports Fishing</td>
<td>San Diego</td>
<td>whale watching*, fishing, liveaboards</td>
</tr>
<tr>
<td>Searcher Sports Fishing</td>
<td>San Diego</td>
<td>whale watching*, fishing, liveaboards</td>
</tr>
</tbody>
</table>

Note: All liveaboards and foreign camps present in LSI must use local companies to conduct whale watching activities.

Source: (CONANP 2005)
5.5 Perceived Benefits from Ecotourism Development in LSI

Historically the remote access of the lagoon and its few inhabitants has served as a mechanism for sustaining and protecting the environment. However, over the last 30 years, LSI has changed dramatically. Its population has increased more than 20 times, and valuable fisheries resources that once were abundant have become scarce. Poverty among some residents, poaching and resource conflicts increased during this period. Meanwhile the demand for whale watching activities has grown in the lagoon. The development of ecotourism activities is increasingly seen as a hopeful economic alternative to fishing among the community and the management of the Reserve (Dedina & E. 1995; Young 1995). However, research conducted by Dedina and Young warn that, prior to 1994, the socioeconomic benefits from ecotourism were sporadic. They contended that these activities have increased rather than reduced local resource use conflicts (Dedina & E. 1995; Young 1995). These problematic issues included:

- **Lack of Economic Benefits** - During the 1994 season only 16 people from LSI were employed in the whale watching industry. Of the $3.3 million spent by tourists visiting the lagoon through tours organized by outside-based companies only $40,300 (1.2%) was spent on salaries and purchases in the area (Young 1995). It was therefore concluded that most benefits generated from ecotourism activities benefitted people living outside LSI.

- **Continued Reliance on Fisheries** - The short duration of the grey whale season from December to April has made whale watching a supplement rather than a substitute for fishing (Dedina & Young 1995; Nations 1999)

- **Poor Management of Tourism Activities** - Instead of resolving tourism related conflicts, governing agencies have augmented them (Dedina & Aridjis 2002). In 1995 a report was released to the U.S. Marine Mammal Commission on the conservation and development in the Grey Whale Lagoons (Dedina & Young 1995). It noted four problems related to the whale watching in LSI. These challenges related to: 1) overlapping and poorly defined regulatory agency jurisdictions; 2) lack of access by lagoon residents to whale watching permits; 3) non-uniform interpretation of and ineffective enforcement of rules and regulations; and 4) limited communication between resource users and regulatory agencies.
- **Lack of Local Stakeholder Involvement** - In 1994, the first management plan for Viscaino Biosphere Reserve was reviewed. The plan was heavily criticized by scientists in Mexico's most prestigious independent newspaper, *La Jornada*. It highlights a lack of public participation and focus on sustainable development in the area (Dedina & Young 1995)

- **Outside Control over Tourism Activities** - Tour boat operators and whale camp operators based outside LSI controlled a large share of the recreational whale watching market. In 1994, 12 permits out of 16 were given to one of the San Ignacio based companies (Dedina & Young 1995). As a result this company gained almost exclusive rights to service foreign tour boats and camps with guided skiffs. Additionally, there were in 1994 few local restaurants, shops, hotels, or other local businesses to cater to tourists within LSI (Young 1995a).

- **Growing Resource Conflicts over Tourism Issues** - In 1995 significant conflicts emerged among the inhabitants of LSI over the ownership rights to the most land most strategic important to ecotourism activities.

Since 1995, substantial changes have occurred regarding how the tourism operators are cooperating and conducting their businesses in order to attract more visitors and become more competitive (ARIC 2000; SEMARNAP 2000b). The extent to which these changes have increased local socioeconomic benefits and the viability of local tourism operators will be assessed in the next chapter.
6 Case Study Analysis

This chapter analyses how ecotourism in LSI has changed from 1994 to 2002. It uses 34 indicators related to five socioeconomic objectives associated with biosphere reserves to guide the analysis. The five goals are:

- Ecotourism must direct sufficient economic benefits to local people that complement rather than overwhelm traditional practices;
- Successful ecotourism should improve the wellbeing and cohesion of the community;
- Ecotourism should increase the participation of local people in the decision making process;
- Ecotourism should increase the local support for biosphere reserves; and
- Ecotourism operators must be economically viable.

6.1 Indicators of Economic Benefits to the Local People and the Management of the Reserve.

To measure the economic impact of ecotourism development in LSI from 1994 to 2002 eight indicators were used. These were chosen based on what data historically had been published about the economic development in LSI. This was done to make a comparison between the two periods possible. The indicators 5.1.1-5.1.3 were initially used to analyze ecotourism growth in terms of visitor, revenue and employment statistics. These were followed by indicators 5.1.4-5.1.7 that discussed the local share, types and income of these jobs. The final indicator, 5.1.8, examined how ecotourism contributes to the financing of the Reserve.

6.1.1 Changes in Visitor Numbers

Changes in visitor traffic are often used as an indicator for ecotourism growth (Wallace 2002). Since 1994 LSI has seen a dramatic increase from 1,000 to a peak of almost 4,000 visitors in 2000 (Sanchez 2002). A closer look at these statistics reveals that foreign tour companies have seen their visitor numbers stagnate while local and regional tour operators have seen their visitor volumes increase dramatically (Figure 8). This change reflects a growing demand from travellers arriving on their own (Young 2002). These numbers also suggest that local operators have increased their share of economic benefits and diminished their dependence on income from the outsourcing services of foreign companies. A major underlying cause for the growth in visitor numbers is believed to be the good press LSI received in the news media in North America and Mexico during the salt flat conflict from 1996-2000 (Dedina 2002). However, demand for ecotourism remain fickle as visitor traffic fell approximately 20% to 3,300 visitors in 2002 following the 9-11 attack in the U.S (Fischer 2002a; Galvan 2002; Sanchez 2002).
Figure 8: Estimated Number of Whale watching Tourists in LSI from 1993 – 2002

- All local tourism operators as well as the two foreign operated camps reported many cancellations of tours due to the 9-11 attack. This was particularly noticeable for the month of January when tourism demand diminished by an estimated 30-50% (Aquilar 2002, Fischer 2002a, Mayoral 2002).

- As noted earlier (p59) When environmentalist in 1996 made LSI the center of world attention by fighting ESSA’s proposal to build a salt extraction flat, the lagoon went from being a relative unknown whale watching location to one recognized at a global level (Dedina 2000b, Russell 2001). By the time the conflict ended, more than 750,000 protest letters had been sent to the Mexican government; numerous prominent Hollywood celebrities including Glenn Close, Pierce Brosnan had been whale watching in the lagoon; and more than 50 NGOs had been involved in helping to stop the project (Dedina 2000a, Mader 2000, Russell 2001). The end to the massive media exposure of LSI is therefore part of the likely explanation for the recent decline in visitors.
From 1994 to 2002 the foreign companies' and the tour boats' share of the visitors declined from approximately 65% to 20% of the market (From 1,420 to 640 tourist) (Lopez 2002; Young 1999b). One upscale foreign U.S. operator expressed that this trend was likely to continue as local operators were becoming better at offering competition to market segment previously occupied by only foreign businesses (Ivey 2002).

Historically approximately 10-15 boats of various origins visited LSI for whale watching purposes. (Young 1999b) In 2002 this number fell to approximately 7-10 (Ivey 2002; Lopez 2002). It was therefore not surprising that the number of people arriving by boat since 1994, decreased from 400 to approximately 230 people in 2002.

6.1:2 Changes in Ecotourism Revenue

Previous calculations of revenue have been very rudimentary

Only very rudimentary estimates have been published for ecotourism revenue in LSI. Young found that the gross earnings of outside-based tourism operators in LSI were approximately U.S. $3.3 million in 1994 (Young 1999a). These numbers were found by multiplying the number of visitors from selected whale watching segments with an estimated average price of these tours (Table 8)

<table>
<thead>
<tr>
<th>Type of tour operation</th>
<th>Number of tourists</th>
<th>Typical period of stay in the lagoon (days)</th>
<th>Average price/person ($U.S.)</th>
<th>Tour Operators' gross earnings ($U.S.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cruise ships (2)</td>
<td>560</td>
<td>1.5</td>
<td>$3,500</td>
<td>$1,960,000</td>
</tr>
<tr>
<td>Tour Boats (6)</td>
<td>500</td>
<td>3</td>
<td>$1,500</td>
<td>$750,000</td>
</tr>
<tr>
<td>High-priced tour camps</td>
<td>360</td>
<td>3</td>
<td>$1,300</td>
<td>$468,000</td>
</tr>
<tr>
<td>Low-priced tour camps</td>
<td>175</td>
<td>2.5</td>
<td>$800</td>
<td>$140,000</td>
</tr>
<tr>
<td>Total</td>
<td>1,595</td>
<td></td>
<td></td>
<td>$3,318,000</td>
</tr>
</tbody>
</table>

Source: (Young 1999a)

These numbers presented a weak and incomplete economic analysis of the tourism activities in LSI for a number of different but valid reasons:

- No estimate of local operators revenue - No estimate of gross revenue was made for any of the local tourism operators (although Young noted that three fishing families and one individual
netted between $2000 and $6000 from providing guided whale watching tours, camping facilities and home cooked meals).

- **Estimations were flawed because they accounted for revenue mostly spend outside LSI** - Young wrote in her analysis that less than 1.2% of the $3.3 million generated by outside operators were spent locally on food, supplies and salaries. This gave the impression that locals benefitted very little from the money spend by the foreign operators and tour boats. However, Young’s calculations of the gross revenue for liveaboards and foreign camps included airfare or boat transportation costs from the U.S. They also included revenue spent on other activities outside LSI. For liveaboards this money was substantial as the primary purposes of these trips were fishing along the pacific coast. These estimations of gross revenue calculations can therefore not be used as indications for leakage as most of this money was spent outside LSI.

- **Price estimates were likely to be highly uncertain** - Young did not indicate how she calculated the average tour prices and estimated the number of visitors. The visitor numbers were considered to be relatively certain as tourism operators kept track of each other had to submit their visitor numbers to the reserve in 1994. More uncertain were the historic price estimates for the various segments. In 1994, visitor spending depended on numerous factors including the duration of overnight stay; number of whale watching trips, purchased food, nationality; age; and the mode of transportation offered to LSI from the U.S. Estimating correct prices would therefore have required access to detailed visitor records from the various companies.

*Young’s methodology was used, but slightly improved by adding ranges to better show uncertainties*

Young’s methodology and most data points were nevertheless used as the basis for estimating ecotourism revenue in LSI. This was done because the lack of other historical data points dictated the use of this methodology to be able to compare 1994 with 2002. It was also not an option to ask the tourism operators to submit their revenue numbers because of the perceived sensitivity of these numbers. However a few changes were done to strengthen Young’s methodology:

- Local and regional gross revenue from day tours; outsourcing guide services to foreign camps and liveaboards were calculated. This was done to obtain a better estimate for what was earned inside LSI during 1994 and 2002. It was possible to create these historical data based on visitor number given by ARIC and the Reserve; and by assuming that some of the observed price and visitor data estimated for 2002 were valid assumptions for 1994.
• In lack of access to the tour operators’ accounts it was not possible to make very precise estimates of visitor prices. To account for these uncertainties a range of prices were used representing a typical, worst and best case scenario (where the data permitted it).

• Young estimated that 175 people on average spent 2.5 days and $800 each on low priced outside based camps in 1994. Then only operator, a regional operator, offered these tours. In 2002, it charged $135 for its all inclusive package tours. It also claimed that its prices had not changed significantly since 1994. Young’s estimate of revenue for this segment ($320 per visitor per day) was therefore discarded as being vastly overestimated. $135 per day with an average stay of 2 days was chosen as a more conservative estimate instead.

The following two tables indicate the assumptions, visitor numbers and estimated ecotourism revenue for 1994 and 2002. For a more detailed breakdown of the calculations and assumptions see Appendix 1.
Table 9: Estimated Gross Revenue Defined by Ecotourism Operators in LSI for 1994 and 2002

TOURISM SEASON 1994:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Visitors</th>
<th>Price</th>
<th>Duration</th>
<th>Estimated Gross Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Range</td>
<td>Typical</td>
<td>Range</td>
</tr>
<tr>
<td>LOCAL/REGIONAL OPERATORS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day tours</td>
<td>605</td>
<td>$30-35 per trip</td>
<td>$33</td>
<td>1-2 trips</td>
</tr>
<tr>
<td>Outsourcing Foreign Camps</td>
<td>360</td>
<td>$17-28 per trip</td>
<td>$23</td>
<td>4-6 trips</td>
</tr>
<tr>
<td>Outsourcing Liveaboards</td>
<td>1060</td>
<td>$17-28 per trip</td>
<td>$23</td>
<td>1-2 trips</td>
</tr>
<tr>
<td>Package Tours</td>
<td>175</td>
<td>n/a</td>
<td>$135</td>
<td>1-3 days</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2,200</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOREx CAMPS /LIVEABOARDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Camps</td>
<td>360</td>
<td>n/a</td>
<td>$1,300</td>
<td>n/a</td>
</tr>
<tr>
<td>Liveaboards</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Cruise Ships</td>
<td>560</td>
<td>n/a</td>
<td>$3,500</td>
<td>n/a</td>
</tr>
<tr>
<td>• Tour Boats</td>
<td>500</td>
<td>n/a</td>
<td>$1,500</td>
<td>n/a</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,420</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL ALL OPERATORS</td>
<td>2,200</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

TOURISM SEASON 2002:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Visitors</th>
<th>Price</th>
<th>Duration</th>
<th>Estimated Gross Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Range</td>
<td>Typical</td>
<td>Range</td>
</tr>
<tr>
<td>LOCAL/REGIONAL OPERATORS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day tours</td>
<td>2,280</td>
<td>$30-35 per trip</td>
<td>$33</td>
<td>1-2 trips</td>
</tr>
<tr>
<td>Outsourcing Foreign Camps</td>
<td>400</td>
<td>$17-28 per trip</td>
<td>$23</td>
<td>4-6 trips</td>
</tr>
<tr>
<td>Outsourcing Liveaboards</td>
<td>250</td>
<td>$17-28 per trip</td>
<td>$23</td>
<td>1-2 trips</td>
</tr>
<tr>
<td>Package Tours:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Company A</td>
<td>300</td>
<td>$135 per day</td>
<td>$135</td>
<td>1-3 days</td>
</tr>
<tr>
<td>• Company B</td>
<td>70</td>
<td>$185-225 per day</td>
<td>$200</td>
<td>1-4 days</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,300</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOREIGN CAMPS /LIVEABOARDS</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Foreign Camps</td>
<td>400</td>
<td>$1,500-1,700 per tour</td>
<td>$1,650</td>
<td>n/a</td>
</tr>
<tr>
<td>Liveaboards</td>
<td>250</td>
<td>$3,125-5,500 per tour</td>
<td>$5,500</td>
<td>n/a</td>
</tr>
<tr>
<td>TOTAL</td>
<td>650</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL ALL OPERATORS</td>
<td>3,300</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: Based on visitor numbers and prices submitted by Young (1999), the Reserve, ARIC and 4 local tourism operators.
Discussion of Results:
Looking at changes in the gross revenue of all the tourism operators LSI saw a number of significant changes between 1994 and 2002 (Figure 9.)

Figure 9: Estimated Ecotourism Gross Revenue in LSI defined by Operator Type in 1994 and 2002

<table>
<thead>
<tr>
<th></th>
<th>1994</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local and Regional</td>
<td>$146,000</td>
<td>$258,000</td>
</tr>
<tr>
<td>Foreign Camps</td>
<td>$468,000</td>
<td>$660,000</td>
</tr>
<tr>
<td>Liveaboards</td>
<td>$2,710,000</td>
<td>$875,000</td>
</tr>
<tr>
<td>Total</td>
<td>$3,324,000</td>
<td>$1,793,000</td>
</tr>
</tbody>
</table>

Sources: Based on visitor numbers and prices submitted by Young (1999), the Reserve, ARIC and 4 local tourism operators.

Overall ecotourism declined from approximately US $3.3 to $1.8 million during this period (or using the best case and worst case scenario to somewhere between $1.5 and $2.5 million). This decline reflected a drop in the number of tourists arriving by liveaboards from approximately 1000 to 250 visitors. Because of the high cost of these tours (between $3 125 and 5 500 per visitor in 2002) this segment’s gross revenue dropped from approximately $2.7 million to approximately $1.4-2.1 million between 1994 and 2002.

Foreign camps saw during this period their revenue increase from approximately $470,000 to somewhere between $600,000 and $720,000. This improvement was a combination of higher prices and small increases in visitor numbers.
Based on the estimated typical scenario, local and regional tourism operators increased their revenue from approximately $150,000 to $260,000 between 1994 and 2002 (or gains of approximately $70,000 adjusting these numbers for inflation). Looking at the worst case and best case scenario showed that local and regional ecotourism operators made between $80,000-230,000 in 1994. These amounts increased to $150,000-430,000 in 2002. Big uncertainties were therefore involved in estimating local and regional tourism revenue. However, it appears quite certain that tourism operators increased their revenue because of the strong growth in visitors. The defined ranges also indicated that local and regional tourism operators share of the total generated ecotourism revenue increased from approximately 3-7% to 10-17% between 1994 and 2002.

A further breakdown of the local and regional revenue showed that it was the combined growth of local package and day tours that were the driving force behind the local and regional increase in gross revenue (Figure 10). The growth of these was more than sufficient to offset the decline in outsourcing revenue from liveaboards during the 90s. Using the estimated typical scenario these segments accounted together for approximately 80% of the local and regional gross revenue in 2002 (up from 46% in 1994). This scenario suggested that day tours grew the fastest (from approximately $20,000 to $80,000), while package tours remained the segment that generated the most revenue (from $47,000 to $123,000) between 1994 and 2002. However, considering the worst and best scenarios it could not be firmly concluded that package tours were the largest segment in 2002.
6.1.3 Growth in Ecotourism employment
A change in the number of jobs is a commonly used indicator for measuring ecotourism growth, trends, and economic benefits (Eagles & Bowman 1999; Wallace 2002). In LSI the number of people working directly in ecotourism businesses during the whale watching season increased significantly from 34 in 1994 to 68 people in 2002 (Aquilar 2002; Fischer 2002a; Lopez 2002; Mayoral 2002; Young 1999b). Ecotourism in LSI also indirectly supports an additional 25 lodging, restaurant, and transport jobs in the neighbouring town of San Ignacio (Galvan 2002). These employment numbers for LSI also discount the handful of foreign naturalists and staff that accompanies visitors travelling with the two upscale foreign camps.

6.1.4 Changes in Types of Ecotourism Employment
When ecotourism grows it often leads to the establishment of new kinds of jobs (Buckley 2003). Such structural changes were also visible in LSI as the growth in the number of visitors and the tourism operators camps increased the number and types of jobs needed for cleaning, cooking, camp maintenance, accounting, sales, and entertainment also expanded. As a result of these
structural changes, land based jobs grew from roughly 50% to 70% of the ecotourism job market in LSI between 1994 and 2002 (Aquilar 2002; Fischer 2002a; Lopez 2002; Mayoral 2002; Young 1999b). However, skiff drivers continued to be the single biggest source of employment (Table 10).

Table 10: Types of Ecotourism Related Jobs in LSI 2002

<table>
<thead>
<tr>
<th>Job type</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skiff driver</td>
<td>25</td>
</tr>
<tr>
<td>Kitchen staff, cleaners</td>
<td>15</td>
</tr>
<tr>
<td>Office staff / managers</td>
<td>8</td>
</tr>
<tr>
<td>Camp maintenance</td>
<td>6</td>
</tr>
<tr>
<td>Naturalist</td>
<td>4</td>
</tr>
<tr>
<td>Cooks</td>
<td>4</td>
</tr>
<tr>
<td>Outside promoters</td>
<td>2</td>
</tr>
<tr>
<td>Drivers</td>
<td>2</td>
</tr>
<tr>
<td>Camp entertainers, musicians</td>
<td>2</td>
</tr>
<tr>
<td>Lifeguard</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>68</strong></td>
</tr>
</tbody>
</table>

Sources: Compiled through literature by Young, E. (1994, 1996, 1997) and interviews with tour operators in LSI and the tourism union ARIC and the management of the Reserve VIBERE (2002)

- According to biosphere regulations from 1992 only people from the region can become whale watching skiff drivers (Dedina & Young 1995). The number of these jobs has traditionally been proportional with the amount of boat permits. As the number of permits increased from 16 to 25 so did the amount of skiff driving positions between 1994 to 2002 (Aquilar 2002; Fischer 2002a; Lopez 2002; Mayoral 2002; Young 1999b).

- A person that monitors the behaviour of tourism operators on the water and stands by a shore with a skiff in case of emergencies has been hired by tourism operators union, ARIC, since 1997 (Fischer 2002a). The tourism operators also usually hire a doctor for the tourism season. However, in 2002, the money for this salary was put aside to hedge against a proposed Mexican tax on whale watching activities (Lopez 2002).

6.1.5 Changes in the Local Share of Ecotourism jobs.

- An important criterion for local communities to benefit economically from ecotourism development is for locals to hold associated jobs (Eagles & McCool 2002). If local is defined as someone who resides permanently in LSI, then 50% or 17 more local people were employed in the tourism industry compared to 1994 (Moreno 2002). Based on a recent
census by a local teacher these jobs accounted for approximately 14% of LSI’s adult population in 2002 (Moreno 2002). However, comparing 1994 with 2002 showed that the local share of the ecotourism jobs had remained unchanged at 50% (Table 11). In 2002, the remaining jobs were mostly held by people from the neighbouring towns of San Ignacio, Santa Rosalia and Aqua Verde (43%) with a minor share held by people from other parts of Mexico (4%) and from other countries (3%) (Moreno 2002).

Table 11: Level of Local Employment in LSI Recorded in 1994 and 2002

<table>
<thead>
<tr>
<th></th>
<th>1994</th>
<th></th>
<th>2002</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>34</td>
<td>17</td>
<td>67</td>
<td>34</td>
</tr>
<tr>
<td>Local</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


6.1.6 Changes in Local Ecotourism Salaries Compared to Local Fishing Income and Other Regional Salaries.

Income levels can be a useful economic indicator for measuring direct economic benefits and changes to living standards (Scheyvens 1999). In LSI salary information was collected for guides and operators of whale watching skiffs, the monitoring lifeguard, and one cook. These data were compared with the estimated income and salary of local fishers. To put these salaries in a wider regional context these data were also compared with the minimum wage of Baja California Sur. These findings are summarized in Table 12. These data suggest that working in tourism in LSI is well paid both by local and regional standards. Unfortunately, these salaries are only available three months of the year (Dedina 2002). Moreover tourism salaries were in 2001 in LSI lower by as much as $200 a month due to the effects of 9-11 (Aquiliar 2002; Ramirez 2002). Sustaining a family in LSI either from fishing or tourism alone is therefore difficult. A recent estimates suggested in 2001, a monthly salary of over US $500 was needed to provide for a household of four in Baja California (San Diego Dialouge 2001).
Table 12: Monthly Gross Income of Ecotourism and Fishing Jobs in LSI Compared with the Minimum Wage in Baja California Sur 2002.

<table>
<thead>
<tr>
<th>Job Description</th>
<th>Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whale watching guide / Skiff driver (1)</td>
<td>$690-810</td>
</tr>
<tr>
<td>Lifeguard / Tourism Observer (2)</td>
<td>$500</td>
</tr>
<tr>
<td>Cook (3)</td>
<td>$220</td>
</tr>
<tr>
<td>Independent Fishers (Own Boat) (4)</td>
<td>$320-560</td>
</tr>
<tr>
<td>Fishers (Helper/Crew) (5)</td>
<td>$230-250</td>
</tr>
<tr>
<td>Minimum Wage in Baja California Sur (6)</td>
<td>$120</td>
</tr>
</tbody>
</table>

Sources:
1. Range of average monthly income from January through March reported by 5 skiff drivers in 2002.
2. ARIC reported in 2002 the observer's salary to be $20 per day. Monthly salary = 20 x 25 days
3. Monthly salary as reported by one tourism operator in 2002
4. Independent fishers and boat owners did not have a fixed salary in 2002. Their gross income was what was left after expenditures like, gas and oil, ice, equipment maintenance and wages for crew had been paid. The above estimate was based on what 2 independent fishers and boat owners stated they made during the fishing season after these expenses had been paid from April through December 2002.
5. Monthly salaries paid to fishing staff as reported by 2 independent Fishers. Fishing staff were paid a percentage of whatever was caught in 2002. Their salaries were calculated as an averages based on what they were paid totally from April through December 2002.
6. Daily minimum salary of $4.8 x 25 as reported by the Mexican Ministry of Information in 2002(Comision Nacional de los Salarios Minimos 2002)

- Tourism salaries were estimated to be 20 to 250% higher than fishers earned during the fishing season in 2002. In addition these jobs were perceived to be more attractive as they were safer and involved shorter working hours than fishing (Dedina 2000b).

- Skiff drivers were paid approximately 5-7 times higher than the monthly minimum salary in the state of Baja California Sur in 2002. This was competitive since less than 15% of the employees in Baja California earned more than 5 times the minimum salary in 1998 (San Diego Dialouge 2001).

6.1.7 Displacement of Traditional Jobs Caused by Ecotourism Development

Ecotourism job creation must supplement rather than replace existing jobs except for the few instances where such a substitution is desirable (Eagles & McCool 2002; Orams 1999; Scheyvens 1999). A desired objective in LSI is to transform the local economy to one
reliant more on ecotourism and less on fishing (Nations 1999; SEMARNAP 2000). In 1997 new fishing regulations were implemented within the biosphere reserve of El Vizcaino. Fishing licenses are now restricted to reserve residents and local cooperatives. In addition outside fishing boats are denied access to fish within five miles of the coastline of the biosphere reserve (Esliman 2002). These measures have helped reduce the number of temporary and outside fishers. The governing agency that oversees fishing issues inside LSI, the Mexican ministry of fisheries (PESCA), never monitored these changes (Dedina 2002). It could therefore not be established how many of these fishers have disappeared.

What is more certain is that most local resident males living in LSI continue to be involved in fishing. This is also true for the ones involved with ecotourism as the peak fishing season occurs April through November outside of the tourism season. Due to lack of other job opportunities, most local male employees begin fishing immediately after the tourism season ends (Young 1999b). Ecotourism development has therefore not resulted in any significant reduction in fishing jobs (Young 2002). Approximately 100-130 people were involved with fishing in LSI in 2002 (Esliman 2002).

6.1.8 Increases in the Contribution of Ecotourism Revenue to Biosphere Management Funding

Management of tourism-related activities in biosphere reserves (research and program development, direct problem solving, negotiations, habitat protection, monitoring, tourism infrastructure etc.) implies expenses. To sustain such activities, ecotourism revenue must eventually be directed back to the management of the Reserve (SEMARNAP 2000). In 2000, the management of El Vizcaino imposed a whale watching visitor fee of $2 per trip. When the management of Reserve realized how high the administration cost would be, the local tourism union ARIC was put in charge of collecting and reinvesting the money for future tourism activities and the common good of the community (Sanchez 2002). Revenue from ecotourism activities have therefore never been contributed directly to the Reserve.

6.2 Indicators for Increased Participation of Local People in the Decision-making Process that Determines the Kind of Ecotourism that should occur.

Five indicators were used to measure the changes to political involvement and local participation in ecotourism development from 1994 to 2002. The indicators 5.2.1-5.2.2. evaluate how management support for local ecotourism has evolved. Indicators 5.2.3-5.2.5 suggests extent to which locals have become actively involved in the design, management and enforcement of
ecotourism activities. These indicators were chosen based on what was feasible to examine based on the historical published data.

6.2.1 Changes in the Presence of Staff Delegated to Community Relations Tasks

Experiences from biospheres suggest that management staff must visit local communities frequently to establish a good working relationship with locals. (Wells & Brandon 1992) Such visits give communities opportunities to voice local concerns and management the needed input to react to these issues (Scheyvens 1999). In LSI staff has rarely come to visit historically. In 1994, numerous locals indicated that they had never seen or interacted with staff from the Reserve (Young 1995b). However, over time management staff visits have increased as LSI ecotourism activities grew in scale (Fischer 2002a). This presence was reflected in the significance the management of the Reserve places on ecotourism development, the actual relocation of the biosphere reserve’s head quarters to the region; their efforts to involve locals more fully in the development of the Reserve; and the need to evaluate ESSA’s proposal to expand it salt extraction facilities. (Cortez 2002; Dedina 2002; Sanchez 2002):

- In 1994 the El Vizcaino Biosphere Reserve had only a handful of employees. They also had a high turnover of labour because of delays in GEF funding and irregular payment of salaries (Dedina & Young 1995). In 2002, the Reserve had 22 employees, five of whom core staff (a director, a vice-director, an administrator, and two project coordinators. The other 17 were field support staff and patrol officers (Esliman 2002). Despite these improvements the management of the Reserve remains heavily understaffed. In some cases, only one person is responsible for two or three reserve management components in an area covering 2.5 million hectares (Esliman 2002). Therefore limited opportunities exist to management staff to visit the entire area (Young 2002). However, most tourism operators noted management’s willingly to come when needed to specific sites.

- In 1994 nine INE monitors and five PROFEBÁ inspectors were dispatched to the lagoon at different times over a two-month period to deal with local complaints over illegal fishing and tourism activities (Young 1995b). These unprecedented visits served as an important first step by the Mexican government in taking a more active role in the administration of El Vizcaino Biosphere Reserve. They sent personnel to learn firsthand about the realities of actual events happening in the area (Young 1999c).
• From 1995 to 2002 many government officials and scientists extraordinarily visited LSI. They did so to examine the threats from the proposal to expand ESSA/Mitsubishi’s salt production facilities (Nations 1999); (Fischer 2002a; Lopez 2002; Mayoral 2002; Moreno 2002).

• In 1995 the Reserve’s management headquarters was relocated from La Paz to Guerrero Negro (SEMARNAP 2000). While the new location is still at least a 3hrs drive from LSI it is now much easier for staff to visit (Camacho 2002). Equally important was the establishment of a fax and phone service in El Cardon in 1999. This improved the communication between the Reserve’s management and the inhabitants of LSI. It facilitates routine matters and concerns to be addressed more directly and quickly (Moreno 2002).

• Prior to 1994 government officials would often take bribes or demand illegal fees (Dedina & Young 1995; Young 1999b). Today tourism operators noted that they no longer have such problems with the staff from the management of the Reserve. This has helped improve local confidence in governing agencies. (Fischer 2002a; Lopez 2002; Mayoral 2002; Moreno 2002).

6.2.2 Changes in Management Efforts to Capacitate Local Ecotourism Development
Ecotourism is more likely to succeed if management actively helps locals to benefit from ecotourism development (Scheyvens 1999). Historically, this has not been the case in LSI. In 1994 tourism operators for example expressed a “wait-and-see attitude in asserting whether the increased official attempts to establish of rapport with area residents would bring about positive changes for the families and the community as a whole” (Young 1995b). Today most tourism operators speak highly of the good relationship with the management of the Reserve and its efforts to be attentive to local needs. As a result management is now seen as an active partner that organizes tourism activities; supports local involvement in tourism management, and experts efforts to increase local tourism operators’ skills (Fischer 2002a; Lopez 2002).

• The management supported from 1997-2000 a joint program with UNESCO and the NGO RARE to train local ecotourism guides (Mahoff 2001). (Section 6.5.10 provides more information on this training program)
In 2001 the management of the Reserve partnered with UNESCO World Heritage Centre, the United Nations Environment Programme (UNEP) and RARE to develop a long-term action plan for preserving the biodiversity of El Vizcaino’s two world heritages (Sanchez 2002). The foundation for this plan included integrated ecotourism and awareness strategies that focused on methods to reduce environmental threats, participatory planning, partnership building, and policy awareness. The project that is estimated to take 4 years has 5 objectives (UNESCO 2001):

- Enhance site management capacity for using tourism to support conservation.
- Increase revenue generated from tourism at each site to fund unmet operating needs and long-term conservation costs.
- Build local awareness of and support for conservation efforts at the World Heritage sites.
- Provide local economic incentives for biodiversity conservation by strengthening local capacity for creating community-based enterprises and employment through training, technical assistance, and support to entrepreneurs.
- Link regional, national, and international-level tourism marketing strategies and programs in each country with site and community needs and capabilities.
- Promote the sharing of experiences and best practices for linking sustainable tourism with biodiversity conservation.

In 1999 the management of biosphere reserve hired in conjunction with Wildcoast, a local woman to oversee the building of a community center and conduct environmental workshops for the school children of LSI (Dedina 2002). Popular with the community, she has become an important communication liaison between the management and the locals of LSI.

When important events happen in LSI, the management of the Reserve now send people to participate. For instance this was the case when three employees from the biosphere reserve attended the opening off LSI’s new community centre in April 2002 (Moreno 2002). Approximately 200 locals showed up for the event.

6.2.3 Changes to the Number of Effective Local Institutions to Deal with Tourism Issues

The existence of local institutions or forums where concerns can be dealt with effectively and fairly is an important venue for locals to become involved and exert influence over how ecotourism is developed (Ostrom et al. 1999). Empirical research suggests that this is more likely to happen when local institutions are democratic, transparent and well managed (Becker & Ostrom 1995). This was hardly the case in LSI in 1994. Tourism operators were then poorly
organized and had little influence over the activities in the lagoon (Dedina & Young 1995). This changed in 2000 with the establishment of ARIC the tourist service union. Local tourism operators now have an effective local institution to deal with tourism conflicts and issues (Fischer 2002a; Lopez 2002). Its success is manifest in the increased cooperation amongst the operators, the organization's clear objectives, good management practices and the influence it exerts over decisions concerning tourism development issues (Sanchez 2002).

However, critics see ARIC as a non transparent organization that makes no efforts to communicate its plans and ideas to the wider community of LSI. For instance, they claim ARIC has deliberately chosen not to inform the public in LSI about its plans to create, register and oversee sustainable wildlife units (UMAS) in LSI. One member of ARIC expressed that involving people in LSI would be too cumbersome (Galvan 2002). However, the proposed plan will, if approved, give the tourism operators unprecedented power over the future economic development of the lagoon. Critics argue that ARIC is keeping the plan hidden to quell any possible local resistance, to legitimize perhaps illegal privatizations of property made by the Ejido and to permanently exclude other local residents from future access to tourism activities (Martinez 2002; Moreno 2002)

- ARIC was established as an organization to provide a constructive, community-based response to the development of cutthroat competition for tourists among town residents (Galvan 2002). In the neighbouring lagoon of Bahia Magdalena, such competition led to price wars that quickly eroded the profitability of tour operators in the mid 1990s (Young 1995b). Conversely in LSI the tourism operators have effectively used ARIC to set fixed prices for whale watching day tours (Fischer 2002a).

- Overall, all tourism or conservation organizations within Baja California Sur with a interest in LSI can apply to become members of ARIC. However, new applicants must be approved by 66% of ARIC's general assembly (Moreno 2002). Currently nine organizations are members of ARIC. These include all the tour operators, the local Ejido and two land owners that rent out land for camping purposes (ARIC 2000). Most of them agree that ARIC is well managed and works in manners that is both democratic and transparent to its members. Each member organization has equal representation on ARIC’s general assembly the decision-making component of the organization. Decisions are reached by majority vote. In the event votes are tied, another vote is cast. If the votes
remain tied, the elected president of ARIC gets to make the final decision (Moreno 2002). More importantly, the current distribution of ARIC members makes it difficult for any one faction within the organization to dominate the decision making process (Fischer 2002a; Lopez 2002). This has increasingly fostered cooperation among previously very opposed stakeholders (Dedina 2002; Fischer 2002a; Lopez 2002).

- Prior to 1994 it was challenging for tourism operators to renew their tourism permits. Legal papers had to be signed and renewed personally in La Paz and sent to Mexico City (Aquilar 2002). In one instance one local operator was wrongfully denied his permit (Dedina & Young 1995). While the situation was later resolved, it caused considerable distrust towards the governing agencies (Young 1999b). Today ARIC coordinates the application process for all the tourism operators. Renewal papers and other applications are now handed over to the headquarters of the biosphere reserve in Guerrero Negro (VIBERE). They send copies to the central governing agencies in La Paz and Mexico City (ARIC 2000). Since this system was initiated no existing tourism operators have had problems renewing their permit (Fischer 2002a; Lopez 2002).

- ARIC is actively working towards establishing an UMA (Unidad de Manejo para la Conservacion de Vida Silvestre [Management Unit for the Conservation of Wildlife (UMA)] (ARIC 2000). An UMA is a voluntary zoning plan that commits landowners to conserve certain attributes of their land and wildlife. According to the 200 page management plan suggested by ARIC, the tourism union would assume the wildlife management responsibilities for all Ejido lands, as well as all privately owned property, and federal land and waters including the whale watching zone and the Isla Ibiota (see Figure 11) (ARIC 2000). In 2002, the proposal was rejected by the Mexican government on unclear grounds. This happened despite the strong support from the El Vizcaino biosphere reserve management (Moreno 2002). ARIC is now in the process of appealing the decision (Lopez 2002). The proposed management plan demonstrates how ambitious ARIC have become with respect to the ecotourism development in LSI.
In 2002, ARIC successfully approached the US based NGO “The Ecologic Development Fund” to obtain cheap loans for its members to replace their 2 stroke outboard engines with more economical and environmentally friendly 4-stroke alternatives. The tourism operators embraced this program and its low interest loans. The new engines were expected to bring substantial cost savings (Dedina 2002).

6.2.4 Implementation of Local Ideas in Area Management Plans, Tourism Activities and Legislation

Recent publications assert that local community participation in the development and management of ecotourism activities is a prerequisite to empowering people with the ability to mobilize their own capacities, generate more innovative and flexible policies; engender support for biosphere regulations, and create a more equitable distribution of ecotourism benefits and costs (Agardy 1993; Eagles & McCool 2002; UNESCO 2002b; Wells & Brandon 1992). In LSI, local tourism operators have historically had no such influence as all policies originated from
Mexico City or La Paz (Young 2001). Similarly, government agencies rarely bothered to solicit local knowledge or inform LSI about important changes to rules and regulations (Dedina & Young 1995). More recently this has changed as tourism stakeholders now work closely together with the management of the Reserve to regulate and develop the tourism activities (Fischer 2002a; Lopez 2002). Indicators of these changes can be traced to their local influence over the development of new whale watching guidelines; recent scientific reports on the status of the LSI; and the responsibility ARIC now has to administrate whale watching visitor fees. However, governing agencies in Mexico City still retained the power to judge the legitimacy and feasibility of the advice given by the tourism stakeholders (Dedina 2002). This was witnessed in the government’s recent refusal to grant them a UMA.

- When the first management plan for El Vizcaino biosphere reserve was released in 1995 it was criticised for the lack of community consultation (Dedina & Young 1995). When the management plan was revised in 1997 it involved consultations with 63 different social organizations including local ecotourism operators (Nations 1999).

- In 1999, a UNESCO team consisting of international and Mexican scientist was sent to the lagoon to determine if LSI was an endangered world heritage site. In terms of local involvement the report noted that LSI “remains an example for both international co-operation to enhance capacity building and improve administrative operations, and for facilitating the involvement of local people” (Nations 1999).

- Tourism operators were instrumental in the design of new whale watching guidelines and regulations for the biosphere reserve were redesigned in 1998 (SEMARNAP 2000).

- Representatives from ARIC are now elected to the biosphere Reserve Technical Assessment Council (Fischer 2002a). Established in 1997, the objective of this council is to discuss and find solutions to arising development and conservation issues in El Vizcaino Biosphere Reserve. Both its Board of Directors and the sub-councils are democratically elected (SEMARNAP 2000). Within the Council the intention is to reach consensual agreements to procure better solutions for all. Local input therefore plays more than just an advisory role.
• In the late 90s the biosphere management scrapped plans to personally charge a $5 whale watching visitor fee as it would be costly to administrate relative to the benefits (Sanchez 2002). Instead this responsibility was given to ARIC on the condition that it uses the money to strengthen tourism capacities and for the common good in LSI. This agreement represents a milestone as it is the first and so far the only management component were tourism operators in LSI have been given full sovereignty (Moreno 2002).

• The rejection of the UMA can be perceived as a step back from recent efforts to devolve more powers locally. Some analysts, however, see this rejection more as a political manifestation as the current biosphere reserve manager of El Vizcaino belongs to a different political party than the new environmental minister elected under Presidente Fox in 2002 (Heckel 2002).

6.2.5 Local Involvement with the Enforcement of Ecotourism Rules and Regulations
Local involvement in enforcement activities can help increase compliance with biosphere reserve regulations (Eagles & McCool 2002). This is especially true if the locals themselves have been involved in the design of the regulations they are meant to enforce; and if the rules and regulations are perceived to be fair (Becker & Ostrom 1995). Prior to 1995 in LSI, locals had no involvement with the enforcement of ecotourism activities. At that time, they complained then that they had been marginalized from reserve endeavours, and that the inspectors “often implied double standard in implementing the rules, demonstrated leniency towards outside based tourism operators, while strictly enforcing the rules towards locals” (Dedina & Young 1995). Today these issues have disappeared as the tour operators now help monitor the whale watching activities using their own voluntary guidelines of behaviour in addition to the official ones (Fischer 2002a; Lopez 2002). This is a system that is perceived by both management and the tourism operators to be an appropriate approach (Sanchez 2002).

• Since 1997, tourism operators have paid a lifeguard to monitor and regulate the boat traffic during the whale watching season (Fischer 2002a; Lopez 2002). This system has increased compliance and reduced conflicts on the water. Tourism operators must wait their turn to approach the whales (Fischer 2002a). VIBERE now refers to whale watching activities as some of the most exemplary and best organized in the world (SEMARNAP 2000).
VIBERE has also given ARIC the responsibility to oversee one of only two social surveillance committees in the biosphere reserve. This committee reports unusual observations (poaching threats, whale standings, dead sea turtles, fish die-offs) to the Mexican Ministry of the Environment (PROFEBA) (ARIC 2000). Albeit poaching remains a problem, the work of this committee has done some progress in protecting sea turtles (Dedina 2002). (Section 6.4.3 describes local efforts to participate in conservation initiatives)

6.3 **Indicators for Improvements to Local Community Cohesion and Identity**

Five indicators were used to analyze how ecotourism impacted LSI’s community cohesion from 1994 to 2002. The indicators were initially used to evaluate how ecotourism development had affected local access to fishing, tourism and land resources in LSI. Then they were used to examine the extent to which women and other groups previously uninvolved with ecotourism benefited more from this activity. Section 5.3.5 described the relationship between locals and the community from the perspective of the tour operators. This was followed by comments on how tour operators' efforts to reinvest ecotourism revenues back into the community have progressed. These indicators were chosen because they reflected what could be established about the local community cohesion and identity in LSI based on previous studies from the area in 1994.

6.3.1 **Level of Conflicts between Traditional Uses and Ecotourism Development**

The development of ecotourism activities in biosphere reserves often conflicts with other traditional uses (Buckley 2003; Eagles & Bowman 1999). Fortunately, ecotourism activities have caused very little displacement of fishing activities in LSI (Young 2001). In fact recent biosphere legislation and zoning has helped protect local fishers’ access rights:

- The original zoning regulation of the biosphere reserve stipulated that fishing inside the whale watching zone was prohibited during the viewing season (Young 1995b). Historically this rule have caused only minor conflicts as most fishers would never fish close to whales in fear of losing their net from entanglement with these mammals (Young 1995b). In addition, most fishing takes place outside the tourism season and in the open sea where the whales do not congregate (Dedina & Young 1995). This restriction has nevertheless been eased as fishers now are allowed to use traps and lines inside the lagoon (ARIC 2000).
• Prior to 1995 outsiders could obtain fishing permits. However with recent amendments to Article 48 to the Biosphere Legislation local cooperatives have been granted exclusive fishing rights within 5 miles from the coast (Esliman 2002).

• According to the same laws, landowners cannot restrict fishers' access to the maritime zone unless these rights have been acquired specifically. Many locals continue to launch their boats from the properties of tour operators (Fischer 2002b).

6.3.2 Level of Conflicts over Availability of Tourism Licenses
When ecotourism grow from a benign activity to a more significant economic one, the incentive to join these activities becomes more attractive (Wood 2001a). Conflicts often emerge among existing tourism stakeholders, the community and the governing agencies over how the number of tourism licenses should be set and regulated (Eagles & Bowman 1999).

In 1994 when the permits system was first initiated, government officials attempted to give priority to operators with the longest documented experience in gray-whale watching tourism, as well as to enterprises that would benefit the largest number of local people (Dedina & Young 1995). Because some of the local operators had previously operated on an informal basis, they had few papers that documented their previous experience. Of the 16 distributed permits 12 permits were awarded to one of the regional operator (Young 1995b). This allocation created considerable tension as the remaining four operators were left with insufficient capacity to service foreign tour boats and camps (Young 1995b). Through close collaboration with the management of the Reserve, most of this tension has been resolved. Since 1994, the number of boat licenses has increased from 16 to 27. All have gone to the existing local and regional tourism operators that had only permit in 1994 (ARIC 2000). However, the outside-based operator still retains 48% share of the boat permits (down from 75% in 1994). Unfortunately, discontent is now emerging from fishers in El Cardon who feel they have been excluded from access to such tourism permits (Young 2001). They argue that existing operators have obtained an unfair monopoly on such permits. This tension is likely to grow as it is unlikely that new permits will be issued or that existing tourism operators will lose or give up any of those they already process (Danemann 2002; Galvan 2002; Moreno 2002).
• Current permit allocation policies favor existing tourism operators. Indeed, permit preference is based on the historical allocation and experience with ecotourism activities (Young 1999b). Valid for three years, licenses can only be lost if they are not renewed in time or if a tourism operator is found guilty of neglecting to comply with existing biosphere reserve regulations (SEMARNAP 2000). This situation is unlikely to occur as the conduct of existing operators is typically seen as exemplarily (SEMARNAP 2000).

• The number of available tourism permits is based on a limit appropriate to protecting the whales, as well as the viability of the tourism operators themselves (Young 1995b). This policy was adopted to avoid a development pattern similar to that found in the neighboring whale watching lagoon of Bahia Magdalena. Too many permits were distributed there in the beginning of the 1990s. It not only resulted in chaotic whale watching activities, but also in low revenue for operators due to overcapacity and discounted pricing (Young 1995b).

• With the new LSI whale watching guidelines implemented in 1997, tourism operators and VIBERE now work closely through ARIC to control the number of permits distributed (ARIC 2000). It is unlikely more will be issued, as the current number of permits seems acceptable to these stakeholders (Young 2002).

• The El Cardon Fishers' chances of obtaining tourism permits are compromised by their status as illegal settlers inside the federal zone of the Reserve (Young 1999c). In addition, other illegal activities like drug smuggling and poaching are associated with this settlement (Dedina & Young 1995). The failures of these residents to enter a constructive dialogue with management to address these issues in the 1990s has not only alienated these stakeholders from reserve management sympathy, but also diminished their political influence over tourism development in LSI (Dedina 2002).

6.3.3 Changes in Conflicts over Ownership of Land with Tourism Possibilities
Not all land within a biosphere reserve is equally suitable for ecotourism activities. For example, charismatic animals might only be found in certain spots; some areas of the Reserve might be inaccessible or impractical for use, or subject to restrictions that prohibits the use of the area (Eagles & Bowman 1999). Land use conflicts therefore often emerge as different stakeholders try to gain control over strategically vital areas (Wood 2001a).
Historically, the distribution of land with tourism potential in the Laguna has not been a problem. Until the early 1990s, all land were either communally owned by the Ejido (20%) or held by the federal government (80%) (Sanchez 2002). In 1994 this situation changed drastically. A change to Article 27 of the Mexican Constitution made it possible to privatize communal land, giving Ejido members the chance to acquire their own land (Young 1995b). This made it possible for the large outside based operator and a handful of other Ejido members to purchase all major tourism and whale watching access points in LSI. Excluding La Laguna, these purchases included the intermittent airstrip, and all of the best beachfront property in El Cardon, La Fridera, La Base, Punta Piedra, and Campo Catarina (Young 1999c) (Figure 12).

This move caused enormous anger in LSI as it included land already used or inhabited by 15 households in La Fredeira and La Base; approximately 100 illegal settlers in El Cardon; and two foreign and local tour operators. Furthermore, the extent of these purchases effectively barred
locals from future access to ecotourism activities. During the mid 90s the conflict escalated, when the new owners tried to evict people. Yet, almost all locals have refused to move away from the land, stating the purchases were illegal (Young 1995b). Most of the long term residents in LSI contended that the land sale was illegal, as the ejido used a majority vote to override the protest of one member who stood to lose his home, land and tourism access. The new owners denied these accusations, blaming the locals for a lack of political involvement and interest in community affairs (Young 1995b). As a result a stalemate over property rights emerged that for years deteriorated the relationship internally among the tourism operators; made the new owners feared and distrusted; slowed down tourism development in some parts of LSI; and excluded El Cardon residents from access to ecotourism benefits. Young therefore stated in 1995 that ecotourism development had escalated resource conflict and hindered local stewardship practices from emerging (Young 1995b). Today the conflict has reached an unstable equilibrium. Some of the existing local and foreign tourism operators have signed leases with the new owners to continue to live and work in the area (Moreno 2002). Improved cooperation and more dialogue through ARIC represent another big signs of progress. VIBERE and the new owners have also recently begun to approach residents of El Cardon to find solutions to the stalemate over the property issues there.

Unfortunately the property issues remained unresolved as of 2002. It therefore continues to be a source of tension as most locals hope to reverse the land purchases.

- The new owners stopped their efforts to evict people from El Cardon in the mid 90s when they began to receive death threats. As a result a gridlock has emerged that for more than a decade has blocked the development of ecotourism activities in El Cardon. While this has enabled settlers to continue to live there illegally, it has excluded them almost entirely from access to ecotourism benefits. Two forces lie behind this fact. First, these residents continue to have a very poor relationship with the new owners. This has shunned residents of El Cardon from getting ecotourism jobs with this employer (Young 2002). Second, their illegal status has hindered them from obtaining the necessary permits to establish their own companies. In the late 90s VIBERE and the new owners tried to solve the gridlock by offering residents cheap land in planned population centre of El Centro in return for leaving El Cardon (Lopez 2002). So far only a few people have accepted the offer to buy 50x50m lots for $US 100. Residents from El Cardon claim the lots are located to much inland for fishing purposes. In comparison to where they live now these lots also lack scenery and the possibilities for tourism development.
The gridlock and bitterness emerging from the conflict increased in the 90s significantly the levels of insults and harassment between the opposing parties. One operator, for example, explained that he once lost a significant amount of clients because he was denied access to use the local airstrip by the new owner. Existing operators also complained that the outside based operator on more than one occasion had stolen clients by denying the existence of other companies or by claiming they had gone bankrupt. In a more serious incident, one tourism operator almost lost his boats as the anchoring lines had been cut. However, recently the tourism operators have increasingly begun to cooperate as they have realized they stand more to gain from working together. One big catalyst for this development has been the establishment of the tourism union ARIC in 1997. Signs of a softening of the conflict include:

- Increasing number of meetings involving all tour and whale watching operators (Dedina 2002);
- Cooperation to apply for loans for new outboard engines, obtain tourism licences, avoid price wars and establish an UMA (Dedina 2000a), and
- Invitations for social gathering and year end parties at the premises of Ecoturismo Kuyima (Moreno 2002).

Acknowledging the problems surrounding the privatizations of ejido land in all of Mexico the government has recently amended some of its land laws and set up a commission whose purpose is to provide legal aid to solve property rights issues and reverse illegitimate privatizations (SEMARNAP 2000). According to the lawyer and president of ProNatura, Laura Martinez, the long-term residents of La Fredeira and La Vase stand a good chance of getting back their property because of the irregularities surrounding the privatization (Martinez 2002). Their claims are also strongly supported by the fact that they lived in the area prior to the establishment of the ejido and the biosphere reserve. However, the land issues are unlikely to be solved through the court as nobody in LSI wants the conflict to flare up again, have the money, and fear losing more than what they have already been lost (Dedina 2002). A more likely scenario would therefore be for the affected old time residents to buy back the land cheap from the new owners. According to the management of the biosphere reserve, it would be almost impossible for the new owners to reject such a proposition due the long time settler’s historic rights to the area (Sanchez 2002).
6.3.4 Changes in the Number of Women Involved in Ecotourism Development.

Often ecotourism jobs benefit only a subset of residents (Orams 1999; Pizam & Milman 1984). Young noted in 1994 that relatively few women held ecotourism jobs (Young 1999b; Young 1999c). Since then, the number of women working in the ecotourism industry has increased from approximately 5 to 21 people. This represents an increase in the share of all ecotourism jobs from 15 to 31% (Aquilar 2002; Fischer 2002a; Lopez 2002; Mayoral 2002; Young 1999b). This reflects a growing need among the companies with lodging facilities to service visitors in their camps. Most of these new jobs created have therefore been relatively low skilled (See Table 13).

Table 13: Number of Women Working in the Ecotourism Industry in LSI 2002

<table>
<thead>
<tr>
<th></th>
<th>Number of women employed</th>
<th>Total Employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skiff Driver</td>
<td>5</td>
<td>24</td>
</tr>
<tr>
<td>Naturalist</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Drivers</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Cooks</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Kitchen Staff, Cleaners</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Camp Entertainers, musicians</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Camp Maintenance</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Outside promoters</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Office Staff / Managers</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Lifeguard</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>21</strong></td>
<td><strong>67</strong></td>
</tr>
</tbody>
</table>

Sources: Compiled through literature by Young, E. (1994, 1996, 1997) and interviews with tour operators in LSI and the tourism union ARIC and the management of the Reserve (VIBERE) (2002)

6.3.5 Changes in the Tour operators’ Perception of their Relationship with Visitors.

Perceptions of visitors often change over time from local euphoria over tourist development to apathy, irritation and antagonism as tourism numbers grow (Doxey 1974). Other symptoms of such negative perceptions arise when personal contacts between the local community and visitors becomes more formal, when visitors are perceived to encroach into the local way of life (Mercer 1995). Such negative perceptions and behaviours have not been seen in LSI. Interviewed tourism operators, staff and other locals were overwhelmingly positive in their evaluation of their relationship with visitors (Aquilar 2002; Fischer 2002a; Friday 2002; Gardea-Ojeda 2002; Mayoral 2002). Tourism operators were keen to point out the pride that tourism had brought to their
community and that many friendships had evolved over time with repeating visitors (Aquilar 2002; Fischer 2002a; Mayoral 2002). One local tourism operator for example reported that one group of naturalists had been visiting for almost 15 years in a row (Aquilar 2002). One of the foreign operators also stated that 40% of its visitors were repeats (Ivey 2002).

- Local tourism operators have sometimes received donations from pleased visitors. Items have included used computers, clothing, school supplies and money to buy a new outboard engine. Tips exceeding 10-15% of the tours are also quite normal (Moreno 2002).

6.3.6 The level of Ecotourism Revenues Being Reinvested back into Community Development Projects

Tour operators can help increase support for ecotourism development by reinvesting some of the tourism income back into projects that improve local people’s living standard and quality of life (Barkin 1996; Scheyvens 1999). In LSI there were few signs of such revenue used for local purposes prior to 1994 (Young 1995b). Today this has changed as tourism operators through ARIC have become increasingly involved in the development of the community. Recent projects and services include the payment for a community doctor, building of a shaded courtyard in the school, and trips for school children to visit whales. (Lopez 2002; Moreno 2002).

- In LSI a primary school (age 6-12) was built in 1990 with funding raised by one of the operators. In 2000, the school was expanded to teach secondary levels (age 12-16). These new buildings were made with money donated by National Resources Defence Council (NRDC) and other NGOs. Prior to this development many children did not attend school as the closest one was located in San Ignacio (Moreno 2002). In 2002, tourism operators also helped organize and donate money to build a sun shelter in the school yard (Lopez 2002). They have also on several occasions organized field trips to take local school classes whale watching (Lopez 2002).

- In 1999 ARIC took the initiative to improve landscape’s aesthetics by removing many burned out and abandoned cars along the road of the lagoon (Camacho 2002).

- ARIC and VIBERE donated in the end of the 90s money to help Mexican artist, Francisco Hernandez Zamora hire local school children to complete two large figures on the ground
depicting grey whales in LSI. Made from thousands of empty scallop shells the designs measure approximately 2,000 x 1,200 feet (Lopez 2002). Similar in idea to the geoglyphs of the Nazca lines in Peru they are best seen from an airplane.

- In 2002, ARJC paid $1200 towards the salary of a doctor to be present in LSI during the weekends of the tourism season. Unfortunately no doctor was hired for the 2002 season, as the money was put aside to safeguard for a proposed government tax of US $1,100 per boat (Lopez 2002).

6.3.7 Changes in the Number of Items and Services Purchased Locally

If tourism operators buy items and services locally they can help minimize the money generated from ecotourism that flows out of biosphere reserves (Sharpley 2000; Sharpley & Telfer 2002). Besides the added economic benefits to the community, such local purchases are also likely to strengthen the relationship between the tourism operators and the host communities (Eagles & McCool 2002). In LSI it has historically been difficult for tourism operators to make their purchases locally as there were no shops, food services, and products available (Dedina & Young 1995; Young 1999b). Now a couple of small stores have emerged that sells candy, beer, a few food items and potable water. However, as prices are high and selection poor, these shops are used by locals for mostly "emergencies" (Moreno 2002). Locals as well as tourism operators therefore continue to buy most of their commodities including gasoline, water, and food elsewhere. The one exception is fresh seafood, which all operators buy locally when they do not have time to catch it themselves (Fischer 2002a).

- The lack of drinking water, the low population and the poor condition of the road makes it unlikely that more local products of use to the tourism operators will emerge anytime soon (Young 2002).

- One tourist operator has made a commitment to pay local fishers more than the local fish buyers so as to ensure a fair price and the best fish for the tourists (Lopez 2002).

6.4 Indicators for Local support for the biosphere reserve

To measure whether or not ecotourism development had a positive influence on local support for the biosphere reserve three indicators were used. The first one, 5.4.1, evaluated how local acceptance of the biosphere reserve changed from 1994 to 2004. This was followed by 5.4.2. that
estimated the impacts of educational efforts and interpretive experiences for locals. Finally, 5.5.5. addressed whether ecotourism development increased local efforts to participate in conservation actions. The above indicators were chosen based on the available published historical data on these issues in LSI.

6.4.1 Changes in the Local Acceptance of the Biosphere Reserve
When ecotourism empowers local people economically and socially it is likely to result in a greater local acceptance of biosphere reserves (UNESCO 2002a). This is a development that can be clearly seen in LSI. In 1994 residents were mostly dubious about the Reserve. One long term resident expressed then: "In reality, we don't know what the Reserve is for." Another added that if there was a reserve, "it shouldn't be in name only, it should be set up to take care of the lagoon." (Young 1999b) Today all tourism operators and long term residents interviewed express strong pride and support for the Reserve (Aquilar 2002; Fischer 2002a; Friday 2002; Gardea-Ojeda 2002; Mayoral 2002). It also materialized in improved compliance with whale watching legislation (Fischer 2002a; Lopez 2002). Catalysts for the increasing local support include the increasing economic benefits from ecotourism; the controversy over building the salt extraction factory; local involvement in the design of tourism regulations; the educational work done by a coalition of NGOs; and the improved relationship with the management of the Reserve (Dedina 2002; Lopez 2002; Sanchez 2002). However, less enthusiastic were the fishers from El Cardon that have a hard time seeing what good the Reserve has brought them. This is not surprising considering how little they so far have benefitted from ecotourism development and their strained relationship with the management of the Reserve.

- When ESSA/Mitsubishi in 1994 proposed to expand its salt extraction facilities, LSI grew very rapidly from being a relatively unknown whale watching destination to one of the world’s premier location (Dedina & Aridjis 2002). With the ensuing attention from the growing number of tourists, scientists, government officials and NGOs, locals now know they live in one of the most significant and unique biological habitats in the world. Prior to 1995 only 45% of the people interviewed by Emily Young were aware, that they lived in a biosphere reserve. Another 9 percent knew that they lived in a protected area but referred to it as a national park, not as a biosphere reserve (Young 1995b). In 2002, all respondents interviewed knew that they lived in a biosphere reserve.
6.4.2 Changes in the Educational and Interpretive Experiences for Locals

Educational and interpretive experiences are likely to create support for biosphere reserves and ecotourism activities because they improve local peoples' environmental knowledge and concern for the environment (Dedina 2002). Looking at LSI there were prior to 1994 no such efforts being made (Young 1995b). Today, locals have gained a much better understanding of the unique nature of the biosphere reserve and their role as environmental stewards. This is a consequence of a number of ecotourism training courses and community development programs held by a number of NGOs in cooperation with tourism operators and management (Aquilar 2002; Fischer 2002a; Friday 2002; Gardea-Ojeda 2002; Mayoral 2002). However, efforts have targeted mostly children and stakeholders already involved with tourism activities. These efforts have focused on educational rather than interpretive experiences (Dedina 2000a).

- The NGOs including Proesteros, NRDC, International Fund for Animal Welfare (IFAW), National Resource Defense Council (NRDC), Global Green Grant, Homeland and the management of the biosphere reserve (VIBERE) have since 1999 donated approximately US $25,000 to the community of LSI (Moreno 2002). Most of this money has been used to raise the environmental awareness among the children in LSI (Table 14) (Dedina 2002). Donors believe these steps have had positive impacts on the perception of the Reserve, support for ecotourism and the efforts to conserve the environment. Dedina from Wildcoast for example states that adults now eat less turtle meat because their children ask them not to do so (Dedina 2002).
Table 14: Recent Donations by Biosphere Management and NGOs to LSI

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
<th>Organisation</th>
<th>Donation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb. 1999</td>
<td>Papier-mâché workshop</td>
<td>ProEsteros</td>
<td>$500</td>
</tr>
<tr>
<td>Apr. 1999</td>
<td>Whale watching excursion for local children</td>
<td>NRDC</td>
<td>$1,000</td>
</tr>
<tr>
<td>Mar. 2000</td>
<td>Donation of schoolbooks materials</td>
<td>ProEsteros, IFAW</td>
<td>$400</td>
</tr>
<tr>
<td>Apr. 2000</td>
<td>Whale watching excursion for local children</td>
<td>NRDC</td>
<td>$1,000</td>
</tr>
<tr>
<td>Maj. 2000</td>
<td>Donation of medicine</td>
<td>ProEsteros</td>
<td>$200</td>
</tr>
<tr>
<td>Jun. 2000</td>
<td>Administrative training course in Mexico City for community representative</td>
<td>ProEsteros, IFAW</td>
<td>$1,000</td>
</tr>
<tr>
<td>Jun. 2000</td>
<td>Community development course for community representative</td>
<td>ProEsteros, IFAW</td>
<td>$1,000</td>
</tr>
<tr>
<td>Jun. 2000</td>
<td>Donation of school materials</td>
<td>ProEsteros</td>
<td>$300</td>
</tr>
<tr>
<td>Aug. 2000</td>
<td>Coastal wetland workshop for children in the primary School</td>
<td>ProEsteros, IFAW</td>
<td>$800</td>
</tr>
<tr>
<td>Nov 2000</td>
<td>Establishment of the local community NGO “Organización Comunitaria Pro Desarrollo y Conservación de la Laguna San Ignacio”</td>
<td>ProEsteros, Wildcoast, Global Green Grant</td>
<td>$2,000</td>
</tr>
<tr>
<td>Dec. 2000</td>
<td>Donation of school materials</td>
<td>ProEsteros</td>
<td>$300</td>
</tr>
<tr>
<td>Apr. 2001</td>
<td>Whale watching for locals children</td>
<td>NRDC</td>
<td>$1,100</td>
</tr>
<tr>
<td>May 2001</td>
<td>Donation of office and computer equipment for the new community centre</td>
<td>Homeland</td>
<td>$4,000</td>
</tr>
<tr>
<td>Jul. 2001</td>
<td>Donation of school materials</td>
<td>Ocean Futures</td>
<td>$500</td>
</tr>
<tr>
<td>Aug. 2001</td>
<td>Donation of environmental education material concerning turtles</td>
<td>Wildcoast</td>
<td>$4,000</td>
</tr>
<tr>
<td>Sep. 2001</td>
<td>Donation of one computer</td>
<td>Wildcoast</td>
<td>$800</td>
</tr>
<tr>
<td>Oct. 2001</td>
<td>School excursion to clean the islands &quot;Isla Garza&quot; and &quot;Isla Pelican&quot;</td>
<td>VIBERE</td>
<td>$250</td>
</tr>
<tr>
<td>Nov. 2001</td>
<td>A workshop for protecting turtles for primary and secondary students</td>
<td>Wildcoast</td>
<td>$500</td>
</tr>
<tr>
<td>Nov. 2001</td>
<td>Opening of a bank account for the local NGO</td>
<td>Global Green Grant</td>
<td>$100</td>
</tr>
<tr>
<td>Nov. 2001</td>
<td>Donation of solar panels and batteries</td>
<td>Homeland, NRDC</td>
<td>$2,500</td>
</tr>
<tr>
<td>Dec. 2001</td>
<td>Money for construction of community centre with four rooms, 20 chairs</td>
<td>Global Green Grant, Wildcoast</td>
<td>$3,700</td>
</tr>
</tbody>
</table>

$25,950

Source: Rubi Moreno, WildCoast 2002

- The locals who attended the guide training courses conducted by RARE from 1997-2000 indicated that their environmental knowledge had improved significantly (Lopez 2002; Moreno 2002).
• There are no interpretive signs in LSI to inform visitors or locals about the biosphere reserve or the significance of the area (Moreno 2002). However, the management of the Reserve intent to place a total of 94 interpretative signs inside communities, tourist areas, core areas, and entrances where access is restricted (SEMARNAP 2000).

6.4.3 Changes in the Local Efforts to Participate in Conservation Actions

When ecotourism is successful it will result in more locals taking actions to protect their environment (Eagles & McCool 2002). Prior to 1994 there were few signs of such involvement besides the indirect efforts of tourism operators to work with visiting scientists. This is changing as tourism operators and locals are becoming more involved in conservation and monitoring activities. Catalyst for this development have been not only the growth of ecotourism, but also the high numbers of NGOs that during the salt extraction flat conflict from 1995 to 2000 came to the lagoon to conduct community development work (Dedina 2002). Indications of these changes are seen in the tourism operators plans to set up an UMA, and their involvement in a local monitoring and surveillance committee to protect turtles (Dedina 2002). However, intervening is not without its risks as poaching and drug trafficking often is conducted by the same people (Dedina & Aridjis 2002). In 1997 a resident from El Cardon was shot when he was poaching Abalone in the neighbouring community of Punta Abreojos. Fearing a further escalation of the conflict the Mexican army was subsequently called in to stop a growing rash of arsons that followed apparently in retaliation for the man's death (Young E 2001). Another serious incident happened in the late 90s when a reserve employee had reported an abandoned truck full of drugs and turtle carcasses. Facing death threats for reporting the truck he was given a new identity and moved to a different part of Mexico (Sanchez 2002). Incidents like these are hindering tour operators from becoming more personally involved in conservation efforts (Wallace 2004).

• The suggested UMA represents a significant local attempt to become more involved in the future development and conservation actions of the lagoon (Lopez 2002). The matching 200 page management plan divides the lagoon into 5 different conservation systems containing a total of 15 management subunits. Each subunit is described according to its biodiversity, environmental threats and the actions needed to mitigate these impacts (ARIC 2000). From a wider perspective tourism operators believe the UMA can help strengthen Mexico's property right to the grey whales. This will help safeguard the whales from the renewed international interest in whaling (Lopez 2002). Many of the tourism operators for example expressed their concern over the annual kill of
five grey whales that the Makah tribe of Washington's Cape Flattery region resumed in 1998 - a revival the 13 Canadian bands of the Nuu-chah-nulth Tribal Council would like to share (Meissner 1998).

• The establishment of the local environmental NGO "Organización Comunitaria Pro Desarrollo y Conservación de la Laguna San Ignacio" in 2001 is a recent indication that local interest in conservation have begun to spread beyond the tourism operators (Moreno 2002).

• Until recently, poaching was seen as a relatively low-risk activity with high financial returns as there was little enforcement of fishing regulations. Efforts to crack down illegal poaching have since been stepped up considerably (SEMARNAP 2000). One aspect of these efforts has been a local monitoring and surveillance committee setup by VIBERE and run by ARIC. This committee has since the late 90s worked closely together with other Baja coastal communities in a nation wide turtle-monitoring network set up and funded by Wildcoast. In April 2000 this network caught a notorious poacher with a truck load of dead turtles. His arrest marks a significant victory as he was responsible for killing more than 2,000 sea turtles annually to the Tijuana black market for more than a decade. This poacher has since become a prominent advocate for turtle conservation. The result has been a positive increase in sightings of turtles (Wallace 2004).

• Tourism operators have slowly begun to replace their 2 stroke with 4 stroke engines. This will significantly help reduce engine emission and oil pollution released to the lagoon (Fischer 2002a; Lopez 2002).

6.5 Indicators of The Viability of Local and Regional Tour Operators

The viability of the five local and regional tourism operators that operate in LSI are in this section analyzed by comparing the two companies that sold all inclusive package tours with the three that did not between 1994 and 2002. The indicators in 5.5.1-5.5.3 first analyze the difference between these two groups in terms of growth in employees, visitor numbers and gross revenue. These are followed by changes to these operators' profitability 5.5.4; diversification of services and products in 5.5.5-5.5.6; promotional efforts in 5.5.7; and sales and distribution channels in
5.5.8. Finally indicator 5.5.9-11 looks at the quality of the whale watching experience in LSI. The above indicators were chosen because they were seen as the most feasible to use given the restriction of not having access to the various tourism operators' financial statements and records.

6.5.1 Changes to the Tour Operators' Number of Employees
A common indicator for measuring company growth is employment change. Since 1994 three out of five companies have seen their numbers of employees increase by over 50% (from 26 to 58 people). The growth in employment reflects that more staff was needed to service the tour operator's camp and lodging facilities. The companies that sold package tours saw the biggest employment growth. Their share of the job market grew from 50% to 72% between 1994 and 2002. Analyzing these numbers further showed the largest of one of these employed 60% of the total workforce or 4-14 times more than any of the other operators in 2002.

Table 15: Changes in the Local and Regional Tourism Operators Numbers of Employees 1994-2002

<table>
<thead>
<tr>
<th>Employees</th>
<th>Employees</th>
<th>Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>2002</td>
<td></td>
</tr>
<tr>
<td>Companies that sold package tours (2)</td>
<td>22</td>
<td>49</td>
</tr>
<tr>
<td>Companies that sold mostly day tours (3)</td>
<td>11</td>
<td>18</td>
</tr>
</tbody>
</table>


6.5.2 Changes to the Tour Operators' Number of Visitors
The number of visitors is a commonly used indicator for measuring the size and market share of individual tourism operators (Wallace 2002). In LSI the various tourism operators all reported significant growth from 1994 to 2002. Unfortunately the data did not make it possible to analyse the individual historical records of these companies. In 2002, the companies that sold package tours had a slightly bigger share of the visitors as one of them also did well in terms of outsourcing and selling package tours.
Table 16). This company serviced almost 50% of the visitors in 2002.
Table 16: Numbers of Whale watching Tourists in LSI 2002 Defined by Product Segment and Operator

<table>
<thead>
<tr>
<th></th>
<th>Day tours</th>
<th>Package Tours</th>
<th>Servicing Foreign Camp</th>
<th>Servicing Liveaboards</th>
<th>Total Visitors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Companies that sold package tours (2)</td>
<td>1,040</td>
<td>370</td>
<td>260</td>
<td>250</td>
<td>1,920</td>
</tr>
<tr>
<td>Companies that sold mostly day tours (3)</td>
<td>1,240</td>
<td>140</td>
<td></td>
<td></td>
<td>1,380</td>
</tr>
<tr>
<td>TOTAL</td>
<td>2,280</td>
<td>370</td>
<td>400</td>
<td>250</td>
<td>3,300</td>
</tr>
</tbody>
</table>


6.5.3 Changes in the Tour Operators’ Revenue

The turnover of tourism operators is another indicator that can be used to analyze the structure of the tourism market and hint at the performance of individual companies (Kotler, Haider, & Rein 1993). It was not possible based on the data provided by Young to make any comparison of the local and regional operators’ income for 1994 as these were lumped together. For 2002, this was done using the visitors’ numbers provided by four tour operators, the management of the Reserve and ARIC. To protect the identity of the various tour operators and to highlight some important differences among them these were lumped into two categories: companies that sold package tours and ones that did not.

Using the same method as outlined in section 5.x.x three scenarios (most likely, worst and best) were calculated for each of the four existing whale watching product segments found in LSI in 2002 (day tours, package tours, outsourcing to boats and outsourcing to camps). These different scenarios were calculated to highlight the uncertainties involved in estimating these numbers.

Looking at LSI the local and regional tour operators saw a growth in their revenue from approximately $150,000 to $260,000 between 1994 and 2002 (or $220,000 adjusting 2002 to 1994 levels). These estimates showed that package tours and day tours were the most important market segments in terms of revenue (Figure 13).

A closer look at the typical estimated scenario showed that the companies that sold package tours accounted for approximately 75% of local and regional generated ecotourism revenues generated in LSI in 2002. The worst and best scenario showed that companies that sold package tours had a market share between 50% and 90%. These extremes scenarios were, however, considered unlikely as it would have entailed severely underestimating one group of tour operators while
overestimating the other similarly— or vice versa. The way the calculations were done it would have been more likely to underestimate or overestimate the calculations for both groups. Doing so implied that local and regional package tour operators had a likely market share between 70% and 75% - similar to what the typical estimate showed.

**Figure 13: Ecotourism Gross Revenue in LSI for 2002: Package vs. Mostly Day Tour Operators**

<table>
<thead>
<tr>
<th></th>
<th>Package Tour Operators (2)</th>
<th>Mostly Day Tour Operators (3)</th>
<th>Estimated Min. to Max. Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day Tours</td>
<td>$37,000</td>
<td>$44,000</td>
<td></td>
</tr>
<tr>
<td>Outsourcing Camps</td>
<td>$30,000</td>
<td>$16,000</td>
<td></td>
</tr>
<tr>
<td>Outsourcing Liveaboards</td>
<td>$9,000</td>
<td>$9,000</td>
<td></td>
</tr>
<tr>
<td>Package Tours</td>
<td>$123,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$199,000</td>
<td>$60,000</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Based on visitor numbers and prices submitted by Young (1999), the Reserve, ARIC and 4 local tourism operators.

It is not surprising that the calculations showed that the local and regional package tour companies had the highest turnover as they also were involved in selling day tours like the other companies. More important, however, was the high revenue generated from package tours relative to day tours. Visitors who purchased a package tours (including food, lodging, and whale watching activities but excluding transportation) paid from $135-$1,000, stayed 1-4 days and went whale watching 2-6 times in 2002. In comparison most day tourists spent an estimated US $25-70 depending on whether they went whale watching once or twice. Operators that sold package tours therefore needed much fewer visitors to generate a significant turnover compared to the others operators in 2002.
6.5.4 Changes in the Tour Operators' Profitability

To be successful long-term, ecotourism operators must make sufficient profits to operate, invest in future activities; and be able to survive unforeseen declines in demand (Eagles & McCool 2002). Unfortunately, it was not possible to analyze the tour operators' profitability well. One reason being the insufficient published historical data, another the reluctance of most tourism operators to disclose detailed financial information. However, three of the four local tourism operators in LSI did report their profits in 2002 to be roughly between $3,500 and $6,500. These tourism operators noted that their profitability had been seriously affected by the 9-11 incident. A bigger concern, however, among the operators was a new proposed ecotourism tax for 2003 (Aquilar 2002; Fischer 2002a; Friday 2002; Gardea-Ojeda 2002; Mayoral 2002). This would add an annual levy of 1,020 pesos ($110) per seat for each 10-man boat. In addition tourism operators would have to pay for using the government owned shorelines and fees for overnight staying visitors (Lopez 2002). Depending on the tour operator this would increase yearly operating expenses by $3,200 to $14,000. The tax was therefore seen as a major threat to the viability of the ecotourism industry in LSI in 2002 (Fullerton 2002).

- All local tourism operators and the foreign operators reported many cancellations of tours due to the 9-11 attack (Aquilar 2002; Fischer 2002a; Friday 2002; Gardea-Ojeda 2002; Mayoral 2002). This was particularly noticeable for the month of January 2002 where tourism demand was down an estimated 30-50%.

- To alleviate the new taxes ARIC agreed with the whale watching organizations in the neighbouring lagoons to increase day trip prices from $35 to $42 beginning 2003 (Lopez 2002). Tourism operators were anxious about this strategy because of the risk for further decline in the visitor numbers. However, they saw no other way to avert the treat as the consensus that the tax would come in one form of the other (Aquilar 2002).

6.5.5 Changes to the Tour Operators' Services and Infrastructure.

Tourism companies often add services to existing tour activities to increase revenue (Briggs 2000). In LSI such services include food sales, lodging in the form of huts and camping facilities; souvenir sales and transportation to the lagoon from San Ignacio (Aquilar 2002; Fischer 2002a; Friday 2002; Gardea-Ojeda 2002; Mayoral 2002). Comparing the various local and regional companies showed that the number and kinds of these activities changed little between 1994 and 2002. The companies that sold package tours therefore remained the ones with the highest integration of such services in 2002 (See Table 17).
Table 17: Services Offered by Local and Regional Tours Operators 1994-2002

<table>
<thead>
<tr>
<th></th>
<th>Food Sales</th>
<th>Lodging</th>
<th>Souvenirs</th>
<th>Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Companies that sold package tours (2)</td>
<td>all</td>
<td>all</td>
<td>all</td>
<td>all</td>
</tr>
<tr>
<td>Companies that sold mostly day tours (3)</td>
<td>all</td>
<td>one</td>
<td>one</td>
<td>one</td>
</tr>
</tbody>
</table>

Sources: Compiled through interviews with tour operators in LSI (2002)

A further analysis also revealed that it was the companies that sold package tours that had done the most to expand these services during this period. This was particular seen in their effort to improve their camp and lodging facilities.

*Observed Developments in the Tourism Operators’ Lodging Facilities -* In LSI repeat visitors, generally agreed that the three local and regional run camps with lodging facilities had become tidier, cleaner and had more common dining area facilities than before.

Analyzing the changes made by the two companies that sold package tours to improve their camps showed that one had expanded its camping facilities with 12 simply furnished, rustic cabanas on stilts while the other had upgraded its camp with 8 high quality safari tents. In 2002 these camps would charge in the range from $135 to $250 for an all inclusive one night stay including whale watching, food and other activities. In the new millennia, these changes helped increase these operators turnover because they could charge more for overnight stays; made it possible to accommodate more people at the same time and made it more attractive for visitors to stay longer.

These results contrasted starkly with the operator that did not sell package tours. During the same period this operator’s camp generated much less income because of its low capacity and rustic accommodation that necessitated low prices. In 2002, this camp’s overnight facilities consisted of a basic campground and two plywood sheds with 4 beds each that could be rented for $15-$25 depending on the number of people. Underlining the basic nature of these sheds were their lack of proper windows, concrete floors, and nails that would stick out various places. This camp would therefore only appeal to travellers used to “roughing it”. However, these visitors generally liked the intimate atmosphere of this camp and the insight they got into local life as the owners unlike the other camps lived permanently on the premises in 2002.
Despite the overall improvement noticed in the tourism operators lodging facilities visitors were quick to point out that all the camps remained rustic compared to hotels and motels found in San Ignacio. Some of the criticism included the outside and shared toilets; the poor showers limited to day use only; the lack of access to electricity outside the common areas; the poor insulation against the cold and howling desert winds and the lack of windows facing the ocean.

Transportation of Visitors to and from LSI - Three out of five companies had the capacity to bring visitors on their own to LSI in 2002. The two companies located in San Ignacio did so by having their own vehicles there to bring visitors to and from the lagoon. They reported that having your own vehicles had made it easier for them give visitors a more seamless and integrated tourist experience; made it more timely to plan whale watching tours and use lodging facilities and cut the cost of bringing supplies to the lagoon.

The other company, reflecting its strategy to attract clients from far away, had recently begun to offer tours that included airfare to LSI from the U.S., driving people down from San Diego or picking up visitors in Loreto by minibus (respectively). This company stated that having these different travel options had been a strong sales parameter, because it made it convenient for visitors to chose among a number of unique trips with a fixed itinerary.

Food Sales - Not enough data was readily available to make a valid comparison of the quality of the different tourism operators’ food offerings. However, visitors’ general impression was that the food was delicious. Some even stated it was among the best they had had in Baja California. All tourism operators cook themselves or have someone employed to cook and prepare meals for the visitors. They typically charge 7-15 dollars per meal depending on the dish (Moreno 2002). These meals are usually included with the package tours. Most meals consist of fresh seafood served with beans, rice and tortillas.

Souvenir Sales - Most tourism operators did little to sell souvenirs. The exception was one of the tourism operators that sold package tours. Its sales office in San Ignacio was also a dedicated souvenir shop. Located on the main town square it includes a large selection of books, post cards, maps, and figurines related to the main tourist attractions in the area. This setup has according to the tourism operator also increased the sale of whale watching tours as it has brought people into the store that were initially either unaware or uninterested in this possibility.
6.5.6 Changes to Tour Operators’ Diversification of Ecotourism products.
Tourism operators can also diversify their activities horizontally by adding new ecotourism products (Kotler, Haider, & Rein 1993). In 1994 tourism operators from LSI focused almost primarily on whale watching activities. The management of the Reserve therefore noted that tourism activities were insufficiently diversified in 1998 (SEMARNAP, 2000). The same observation was made by the mission team send by the United Nations to evaluate the status of the biosphere reserve in 1999 (Nations 1999).

However, tourism operators that sell package tours have recently been promoting new activities including kayaking, summer camps for children, tours to see Cochimi Indian cave paintings and guided tours of the other natural attractions of the lagoon (mangroves, cacti, birds and salt flats) (See Table 18) (Aquilar 2002; Fischer 2002a; Friday 2002; Gardea-Ojeda 2002; Mayoral 2002). With the exception of the cave painting tours and camps for the school children these new activities have mostly been promoted as part of package tours.

In contrast the other tourism operators have done little to diversify their products. For the two tourism operators without camps this development is hardly surprising considering day visitors come to experience the whales and leave the same day they arrive (Moreno 2002). Day trippers therefore have little time to benefit from other activities considering the transportation time to and from the lagoon. It also never was an option for the companies located in LSI to offer cave painting tours as these are located in the world heritage site of Sierra de San Francisco because it is necessary to obtain a permit in the museum at San Ignacio. The cave paintings are also located in the opposite direction from LSI making the trip from San Ignacio a much shorter drive.

The overall impression, however, is that all companies could do more to diversify their activities considering LSI pristine nature and abundant plant and animals life (Nations 1999).

Table 18: Available Tourism Activities in LSI Different from Whale Watching 1995-2002

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Kayaking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birding</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salitrales / Cacti Tours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mangrove Tours</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children Camp</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cave Painting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Companies that sold package tours (2)

Companies that sold mostly day tours (3)

Sources: Compiled through interviews with tour operators in LSI and the tourism union ARIC (2002)
• Three educational summer camps for Mexican children (aged 8-13) were held by one of the operators as a pilot project in 2002. Taking place outside the whale watching season, the children were taught about nature through creative and fun educational activities that included drawing and painting; music and singing; arts and crafts; camping and hiking; astronomy; cycling; bonfires; use of wind and solar energy; boat trips and visits to aquaculture and fishing production centres. These youth camps involved considerable amounts of planning with a number of educational institutions across Mexico. The success of these camps have yet to be determined (Lopez 2002).

• Tours to see the Cochime Indian cave paintings take place either on mule or by foot and last from 1-3 days. Painted between 3000 AD and 1600 and hidden in deep impenetrable canyons in the world heritage site of Sierra del San Francisco they are considered one of the truly underdeveloped cultural treasures of North America (SEMARNAP 1997).

6.5.7 Changes to Tour Operators' Promotional Activities
Promotional efforts play an important role in attracting existing and new ecotourism tourists (Kotler 2002). Unfortunately, many ecotourism companies often do little to market their products as they have few resources available and lack marketing skills (Buckley 2003). In LSI, companies have historically relied on word of mouth, the odd review in guidebooks for Baja California and Mexico and a few rudimentary signs (Young 1995b). As of 2002, promotional
activities generally remain poorly developed reflecting the lack of resources put aside for such purposes and the lack of skills (Moreno 2002) (See Table 19). It is also likely that tourism operators historically have perceived little need to improve their promotional activities because visitor numbers was growing rapidly until 2001.

However, the companies that sell package tours have recently begun to do more to attract visitors. One significant aspect of this development was the establishment of company homepages in 2001. Both companies reported that these had helped increase turnover significantly because the web had not only enabled them to reach potential customers worldwide, but also established a quick and efficient means for making bookings and addressing concerns. One of these companies reported that internet sales in 2002 accounted for 30-40% of its sales. Another indication of a more proactive approach to sales and marketing was seen in one of the package tour operator’s effort to become ecotourism certified in 2002.

### Table 19: Promotional Activities Conducted by Local and Regional Operators in LSI 2002

<table>
<thead>
<tr>
<th>Signs</th>
<th>Brochure</th>
<th>Website</th>
<th>Ecotourism Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Companies that sold package tours (2)</td>
<td>all</td>
<td>one</td>
<td>all</td>
</tr>
<tr>
<td>Companies that sold mostly day tours (3)</td>
<td>all</td>
<td>all</td>
<td></td>
</tr>
</tbody>
</table>


- Most of the interviewed visitors knew of specific whale watching companies because of word of mouth or from the recommendations listed in guidebooks like Lonely Planet or from online articles, news papers, books and nature program about LSI. A recent IMAX movie e.g showed more than 5 minutes of footage of whale watching activities from LSI (Mayoral 2002).

- Unlike the neighbouring whale watching community of Guerrero Negro there are no signs along the Baja Transpeninsula highway which inform potential visitors of the possibilities of whale watching activities or that they are approaching a biosphere and world heritage site. This makes it easy to miss LSI as a whale watching attraction.
6.5.8 Changes to Tour Operators' Sales and Distribution Channels

For ecotourism companies to sell their products they must setup ways to service and reach potential clients (Kotler 2002). In LSI ecotourism activities have traditionally been sold on location; at hotels and motels in San Ignacio; or through dedicated sales offices in San Ignacio (Young 1995b). However, recently the companies that sell package have expanded their sales offices to other parts of Baja California or abroad to California in the U.S (Fischer 2002a; Lopez 2002). These companies have also increasingly discovered the web as a means for sales, distribution and customer support (See figure Table 20). This combination of a dedicated sales office and the use of the web allowed these companies to reach more potential customers, service them better and sell more package tours in 2002.

In contrast, day tour companies continued to rely mostly on tourists finding their own way to the lagoon or from the sales the motels and hotels in San Ignacio can generate for them. For two of these operators this development can be explained from the lack of telecommunication facilities in the lagoon (Aquiliar 2002; Mayoral 2002). The tour operators with a sales office outside LSI therefore enjoy a huge competitive advantage as they can service their clients more actively not only through the office, but also over the phone, internet and email. This level of customer contact and communication has been important to sell package tours, because they compared to day tours often were booked in advance and involved more coordination and exchange of information (Friday 2002).

Table 20: Sales Channels used to Promote Whale Watching tours 2002

<table>
<thead>
<tr>
<th></th>
<th>Office San Ignacio</th>
<th>Sales Office Elsewhere</th>
<th>Online Website</th>
<th>Commissioned Motels/Hotels</th>
<th>Travel Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Companies that sold package tours (2)</td>
<td>all</td>
<td>all</td>
<td>All</td>
<td></td>
<td>two</td>
</tr>
<tr>
<td>Companies that sold mostly day tours (3)</td>
<td>one</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: Based on interviews with tour operators in LSI and the tourism union ARIC (2002)

- Only one company has made efforts to sell it tours using independent travel agencies. In 2000, the company distributed 500 brochures to travel agencies in California. However, these efforts only produced a single lead. The company therefore reached the conclusion that the general U.S. based travel agencies were poorly suited to sell specialty tours like whale watching in LSI (Friday 2002). Another contributing failure is, however, likely to be the rather unattractive and homemade feel of the black and white brochure.
• As of 2002 a small communication centre with a satellite phone has been established in LSI (Moreno 2002). However, CB radios still remain the only way to contact people directly living in LSI (Dedina 2002).

• The companies that sell package tours are showing an increasing level of sophistication in their sales setup. One of the companies can be contacted directly via phone, email, or fax to contacts in Tijuana, and Ensenada as well as its San Ignacio office. Written inquires can also be handled by sending mail to San Ysidro in the U.S. The other one has no office in San Ignacio, but can be reached in two regular offices situated in La Paz, Mexico and one in Ocean Side, California. These setup differences highlight a few strategic differences between the two companies that sell package tours. One is better set up to sell tours locally where the other one focuses more on reaching upscale clients in the U.S.

• The commission tourism operators pay to local hotels and motels for selling day tours is set by ARIC. It was $5 per visitor in 2002. But because these hotels also run some of the taxi services that take visitors to the lagoon their financial gain is usually much bigger (Romo 2005).

6.5.9 Visitors Perceptions of Whale Watching Tours in LSI
Tourists' perceptions of the tour activities can be important indicators of the quality of the attractions as well as the services and products offered by the individual tourism providers (Eagles & McCool 2002). In LSI this indicator was examined by speaking informally with approximately 60 visitors in LSI during and after whale watching activities in 2002. Visitor comments were also analyzed by looking at tourism operators' guest books, articles, websites and travel books. These sources indicated very high level of visitor satisfaction that was independent of the operator. They also showed that ecotourism activities had become better organized and professional. A strong indication of the latter was seen in the recent praise given to one of the tour companies selling package tours. This company was listed as one of ten organizations in the world to offer the best ecotourism travel experiences by E magazine in 2002 (E: The Environmental Magazine 2002). In 2005 this company also became the world's first to be certified by Green Globe under the International Ecotourism Standard (IES) (TIES 2005).
- Most visitors stated the experience by far exceeded their expectations in terms of scenery and seeing the whales up close. Some stated touching a whale had been the greatest wildlife experience they had ever had. Of the visitors that had been grey whale watching elsewhere, only two visitors thought it had been better elsewhere.

- Most tourism operators reported that LSI had received many donations from happy visitors in the form of materials for the local school, computers and clothes. One visitor had even helped an operator finance the purchase of a new outboard engine (Aquilar 2002; Fischer 2002a; Friday 2002; Gardea-Ojeda 2002; Mayoral 2002).

- One company estimated 20-30% of its clients were repeats. Some of these clients had come to the lagoon for almost 15 consecutive years (Moreno 2002). Repeat visitors noted that tours generally had become more professional, and better organized.

- Tourism operators' guest books were full of superlatives like: "it was one of the most touching experiences of my life"; "everything was unbelievable" or "we will be back next year".

6.5.10 Changes in the Skills of Tourism Operators

The ability of tour operators to service tourist well often increases when staff have received training in skills like hospitality management, foreign languages, and natural sciences (Eagles & McCool 2002). In LSI most tourism operators and their staff have historically had no formal training specifically related to ecotourism (Young 1995b). Most guides have nevertheless considerable knowledge about the fauna in LSI from working with visiting whale scientists; foreign ecotourism companies and from years of fishing in the lagoon. (Dedina 2002; Dedina & Aridjis 2002; Young 2002).

From 1995-98 the management of the Reserve, UNESCO, and the NGO RARE conducted a series of intensive ecotourism guide training courses for ecotourism operators in Baja California Sur. During the three-month RARE course students lived and studied in an English only environment. The curriculum focused on English, local natural and cultural history, interpretation and guiding skills as well as basic tour planning and marketing (Mahoff 2001). These courses were seen as a big success by both the organizers and the participants. However, of the 49
graduating guides only an estimated 10-12 people were from LSI. The courses also focused very little on the business aspects of ecotourism development like marketing, administration and product development (Friday 2002). It is therefore not surprising that these aspects were perceived as the tourism operators' weakest skills. Comparing the companies showed that the ones that sold package tours generally had better skills with the exception of their knowledge about the biota and biosphere reserve. It is not surprising they had better language skills as they unlike the other companies had someone employed that either spoke the language fluently, natively or had academic experience using it (See Table 21).

<table>
<thead>
<tr>
<th>Companies that sold package tours (2)</th>
<th>Ability to Service Clients in English</th>
<th>Knowledge about the Biota and Biosphere reserve</th>
<th>Promotion Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Good</td>
<td>Very Good</td>
<td>Fair to good</td>
</tr>
<tr>
<td>Companies that sold mostly day tours (3)</td>
<td>Poor</td>
<td>Very Good</td>
<td>Poor</td>
</tr>
</tbody>
</table>

Sources: Based on interviews with tourism operator, clients and personal observations in LSI

- 60-70% of the people who took the RARE courses from 1995-2000 were still working in ecotourism or related fields in 2001. Acknowledging this success in 2002, the non profit organization Baja Ecofund wanted to set up a general guiding school based on the Rare Center’s Interpreting for Conservation: A manual for training local nature guides (Mahoff 2001).

- The management of the Reserve and RARE is now planning a new series of training courses. However, unlike previous courses these will only be available to tourism operators within the two world heritage sites of El Vizcaíno biosphere reserve. The idea is to teach tourism operators in these two locations how they can strengthen and diversify their activities (Sanchez 2002).

### 6.5.11 Changes in the Tour Operators’ Efforts to Educate and Inform Visitors About the Environment

An important aspect of ecotourism is that it helps educate or fulfill visitors need to learn more about the natural wonders or attraction they have come to see (Scheyvens 1999, Wood 2001b). In LSI the improvement in the skill levels of companies and guides has since 1994 generally resulted
in better and more information given to visitors prior and during whale watching tours (Dedina 2002). These improvements were most apparent for visitors who had purchased package tours as visitors were presented with formal lectures and videos about the whales and other natural attractions in LSI (See Table 22) (Fischer 2002a; Lopez 2002). The companies who sold package tours were also better at addressing visitors' educational needs because they had English speaking naturalists hired specifically to address this purpose. Day visitors, in contrast, got little info besides from what the mostly Spanish speaking skiff drivers told them during the trip. This was perceived as an insufficient learning experience by some visitors.

### Table 22: Info About The Flora and Fauna in LSI Given or Available to Visitors in LSI

<table>
<thead>
<tr>
<th></th>
<th>Lectures</th>
<th>Naturalists</th>
<th>Videos</th>
<th>Books</th>
</tr>
</thead>
<tbody>
<tr>
<td>Companies that sold package tours (2)</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Companies that sold mostly day tours (3)</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: Based on interviews with tour operators in LSI and the tourism union ARIC (2002)

- A couple of day tourists expressed that whale watching activities in Guererro Negro had been better than LSI as they prior to the departure had received a 30 min slideshow on the whales.

- All tourism operators had a large selection of field guides concerning the flora and fauna of LSI that could be consulted prior of after the trip.

### 6.6 Summary of the Changes Identified by the Indicators

This chapter illustrated that economic, social and political significant changes occurred in LSI between 1994 and 2002. These are summarized in the table 23:
Table 23: Summary of key changes observed in LSI between 1994 and 2002

<table>
<thead>
<tr>
<th>6.1 Economic Benefits to the Local People and the Management of the Reserve</th>
<th>1994</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1.1 Visitor Numbers</td>
<td>2,200 visitors</td>
<td>3,300 (but down from 4,000 visitors in 2001)</td>
</tr>
<tr>
<td>6.1.2 Ecotourism Revenue</td>
<td>$150,000 in local and regional revenue out of $3.3 million totally</td>
<td>$250,000 in local and regional revenue out of $1.8 million generated totally</td>
</tr>
<tr>
<td>6.1.3 Ecotourism employment</td>
<td>34 people</td>
<td>68 people</td>
</tr>
<tr>
<td>6.1.4 Ecotourism Employment</td>
<td>Little diversity in job types</td>
<td>More types of jobs especially related to servicing needs on the ground</td>
</tr>
<tr>
<td>6.1.5 Local Share of Ecotourism jobs.</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>6.1.6 Local Ecotourism Salaries Compared to other Local and Regional salaries</td>
<td>n/a</td>
<td>Skiff drivers were 20% to 250% higher than local fishing jobs</td>
</tr>
<tr>
<td>6.1.7 Displacement of Traditional Jobs Caused by Ecotourism Development</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>6.1.8 Contribution of Ecotourism Revenue to Biosphere Management Funding</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.2 Participation of Local People in the Decision-making Process</th>
<th>1994</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.2.1 Presence of Staff Delegated to Community Relations Tasks</td>
<td>Infrequent visits</td>
<td>When required</td>
</tr>
<tr>
<td>6.2.2 Management Efforts to Capacitate Local Ecotourism Development</td>
<td>No effort</td>
<td>Considerable efforts</td>
</tr>
<tr>
<td>6.2.3 Number of Effective Local Institutions to Deal with Tourism Issues</td>
<td>No local institutions</td>
<td>The local tourism union ARIC</td>
</tr>
<tr>
<td>6.2.4 Implementation of Local Ideas in Area Management Plans, Tourism Activities and Legislation</td>
<td>None</td>
<td>Some</td>
</tr>
<tr>
<td>6.2.5 Local Involvement with the Enforcement of Ecotourism Rules and Regulations</td>
<td>None</td>
<td>A lot</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>6.3 Improvements to Local Community Collecting and Identity</th>
<th>1994</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.3.1 Level of Conflicts between Traditional Uses and Ecotourism Development</td>
<td>Few problems</td>
<td>No zoning issues between fishers and tourism operators</td>
</tr>
<tr>
<td>6.3.2 Level of Conflicts over Availability of Tourism Licenses</td>
<td>A lot</td>
<td>Emerging</td>
</tr>
<tr>
<td>6.3.3 Changes in Conflicts over Ownership of Land with Tourism Possibilities</td>
<td>A lot</td>
<td>Some</td>
</tr>
<tr>
<td>6.3.4 Number of Women Involved in Ecotourism Development.</td>
<td>5 women (or 15% share of the total jobs)</td>
<td>21 women (or 31% share of the total jobs)</td>
</tr>
<tr>
<td>6.3.5 Tour operators’ Perception of their Relationship with Visitors.</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
<tr>
<td>6.3.6 Ecotourism Revenues Reinvested back into Community Development Projects</td>
<td>Little</td>
<td>Some</td>
</tr>
<tr>
<td>6.3.7 Number of Items and Services Purchased Locally</td>
<td>Almost none except for purchase of sea food produce</td>
<td>Almost none except for purchase of sea food produce</td>
</tr>
</tbody>
</table>
### Local Acceptance of the Biosphere Reserve

<table>
<thead>
<tr>
<th>1994</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good among tourism operators, indifference among fishers</td>
<td>Excellent among tourism operators, improving among fishers</td>
</tr>
</tbody>
</table>

### Educational and Interpretive Experiences for Locals

<table>
<thead>
<tr>
<th>1994</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Some for people working within tourism, but also for children living within the reserve</td>
</tr>
</tbody>
</table>

### Local Efforts to Participate in Conservation Actions

<table>
<thead>
<tr>
<th>1994</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little local involvement</td>
<td>Some involvement among tourism operators; increasing among other local residents</td>
</tr>
</tbody>
</table>

### Viability of Local and Regional Tour Operators

<table>
<thead>
<tr>
<th>1994</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 with package tours operators; 11 with companies that sold mostly day tours</td>
<td>49 with package tours operators; 18 with companies that sold mostly day tours</td>
</tr>
<tr>
<td>2,200 visitors</td>
<td>1,920 with package tours operators; 1,380 with companies that sold mostly day tours</td>
</tr>
<tr>
<td>$150,000 total in local and regional revenue</td>
<td>$260,000 total in local and regional revenue. (200,000 with package tours operators; 60,000 with companies that sold mostly day tours)</td>
</tr>
<tr>
<td>Low</td>
<td>Most likely low</td>
</tr>
<tr>
<td>Limited to basic lodging, food sales, souvenirs and transportation services</td>
<td>Big improvements in package tours operators lodging facilities</td>
</tr>
<tr>
<td>Whale watching activities only</td>
<td>Some diversification among package tour operators (kayaking, birding, mangrove tours, children camps and cave painting tours)</td>
</tr>
<tr>
<td>Signs</td>
<td>Some improvements among package tour operators (use of home pages, brochures and ecotourism certification)</td>
</tr>
<tr>
<td>On-site, from offices or hotels in San Ignacio</td>
<td>Additional outlet for sales among package tour operators (sales offices outside LSI and use of the web)</td>
</tr>
<tr>
<td>n/a</td>
<td>Excellent</td>
</tr>
<tr>
<td>n/a</td>
<td>Some deficiencies in the business skills and proficiencies to serve clients in English particularly among the companies that mostly sold day tours.</td>
</tr>
<tr>
<td>Very little</td>
<td>Good for package tours visitors, poor for day tours travelers.</td>
</tr>
</tbody>
</table>
7  Strategies to Enhance Ecotourism Further in LSI

The case study analysis in the previous chapter suggests that LSI experienced growing socioeconomic benefits from ecotourism development in the period from 1994-2002. However, some residents remain marginalized from these benefits primarily due to unresolved property issues. Furthermore, there are opportunities for ecotourism operators to capitalize much better from the existing ecotourism possibilities through improvements to their marketing, products and services. This chapter discusses the most important barriers to greater ecotourism benefits. The implications of these barriers and strategies to remove them are then suggested.

7.1 Strategies to Improve the Local Economic Benefits

The research suggest that ecotourism in LSI has increased local and regional benefits dramatically. Visitor numbers have grown almost 50%, employment 100% and local and regional revenue almost 90% from 1994 to 2002. This represents about a 57% increase in real terms adjusting for inflation. This analysis also showed that it was highly attractive to work in the ecotourism industry as jobs were well paid compared to local fishing and other regional tourism jobs.

Despite these positive changes, only 14% of the adult population in LSI was involved with ecotourism activities in LSI in 2002. About 50% of the ecotourism jobs continue to be held by people residing outside LSI. Another challenge is that ecotourism income is available for only 3-4 months of the year. Consequently, LSI continues to be highly dependent on its fisheries activities. The tourism operators must also find a way to divert some of the current tourism income to help pay for the administration and maintenance of the Reserve. However, perhaps most worrisome is that visitor numbers appear to have peaked.

It is therefore necessary to identify strategies that lead to higher numbers of low impact visitors, levels of local employment and revenue. Some ways to do this could are to strengthen the tourism and business skills of local residents and tourism operators; enhance or diversify existing tourism activities; improve tourism infrastructure and increase the promotion of tourism activities in LSI. Most of these strategies are discussed in detail in section 6.5 as they relate directly to the viability of the industry and the tourism operators. However, strategies that address biosphere reserve income and infrastructure improvement are discussed below as they depend primarily on the actions of VIBERE.
• **STRATEGY 1: Divert the Proposed Government Ecotourism Tax to the Management of the Reserve (VIBERE).** The proposed Mexican ecotourism tax was perceived to be a big threat to the viability of ecotourism activities in the lagoon in 2002 (Fullerton 2002). However, some of its negative effects can be averted if it is earmarked for funding the biosphere reserve and for strengthening ecotourism activities in LSI. However, it is uncertain whether the management and tourism operators will be able to negotiate such a deal with the Mexican government. Another one is a potential inefficient use of the money associated with collecting and administrating the money.

• **STRATEGY 2: Improve Roads** - In the neighbouring whale watching lagoon, Guerrero Negro, tourist numbers have consistently been three times higher than LSI from the period 1994 to 2002 (Dedina 2002; Sanchez 2002; SEMARNAP 2000). Unlike LSI this location has substantially fewer friendly whale encounters. It has no world heritage designation and it is located in a highly modified landscape (Dedina 2002). The differences in visitor numbers can therefore be contributed to Guerrero Negro’s excellent access roads. Paving the road to LSI would likely increase the numbers of visitors to LSI drastically. It would also make it easier and less costly to bring goods to and from the lagoon. This would benefit all lagoon residents. However, improving the roads could have big adverse environmental impacts and impose unforeseen development pressures. Hence, mitigation needs to be a part of the planning. Financing a road improvement to LSI could also be a big problem. This could partially be solved by implementing user fees for visitors. Part of the suggested ecotourism tax could also be used for this purpose.

• **STRATEGY 3: Establish Better Telecommunication Facilities** - The lack of telecommunication infrastructure in LSI makes it difficult for some of the tourism operators to communicate with their clients and suppliers through (Moreno 2002). This is believed to be a major cause of lost ecotourism sales and marketing opportunities (Friday 2002). Historically, the low population of LSI has made the cost of establishing telephone and internet services prohibitive. However, with changes in mobile, satellite and wireless technology it might be more economically feasible to establish better telecommunication facilities. Some of the tourism operators must also improve their English, marketing and computer skills if they are to benefit from better telecommunication infrastructure. Considering these barriers, another option might be for these tourism operators to partner with a professional tour agency to take care of reservations and customer questions.
7.2 Strategies to Improve the Participation of Locals in the Decision Making

Local tourism operators and the managers of the Reserve have been working closely together since 1994. This has resulted in (i) strong ties with the management of the Reserve; (ii) the establishment of the influential tourism union ARIC; and (iii) increased local involvement in the planning, management and monitoring of the tourism and conservation activities in LSI. Tourism operators for example played a major role in designing the new whale watching guidelines; have become permanent members of the biosphere's Reserve Technical Assessment Council; and have been given sovereign powers to administer tourism visitor fees originally designated for the management of the Reserve (Lopez 2002; Moreno 2002; Sanchez 2002). However, tourism operators' attempts to gain more autonomy over the management of LSI came to a quick halt when their proposed UMA was rejected by the Mexican government in 2002. This dismissal came despite the strong support for the plan by VIBERE (Heckel 2002; Sanchez 2002). It might nevertheless be possible to overturn the central government's scepticism towards further decentralization if tourism operators can raise wider support for their ambitious UMA plan. Two components of this strategy could be to make ARIC more transparent locally and to involve local NGOs in overseeing the UMA.

- **STRATEGY 1: Make ARIC Ideas and Plans more Transparent** – The tourism union ARIC has proven itself to be an effective organization that looks after the interests of the tourism operators. However, its lack of transparency in communicating its ideas like the UMA plan to the wider community of LSI has created some discomfort among some NGOs and inhabitants of the Reserve that question the motives of the organization (Martinez 2002). This situation is likely to have undermined some of ARIC's political strength. One solution is therefore for the organization to consult more openly with the rest of the community to alleviate these concerns. This could be done through community meetings or by making the UMA plan publicly available. However, results are likely to be slow and time-consuming due to the historical distrust between some of the residents and the tourism operators. Some operators are also afraid to communicate more openly as it could stir up old conflicts. Using an experienced and neutral mediator could therefore be useful in establishing a more constructive dialogue.

- **STRATEGY 2: Involve NGOs more in Overseeing the Proposed UMA** - Partnering with NGOs could prove a big step in overcoming governmental and local concerns for implementing the UMA. Organizations like Pronatura, Wildcoast, and the Natural...
Resources Defense Council (NRDC) have already established a successful working relationship with the management of the Reserve and local tourism operators (Danemann 2002; Dedina 2002; Young 2002). These organizations could increase the credibility of the UMA by adding local training, administrative experience, supervision and funding to the plan. This would help override concerns that tourism operators do not have the skills or resources to carry out such a project. Supervision by these NGOs would also help calm local fears that tourism operators have designed the UMA primarily to exclude others from political influence and access to tourism activities (Dedina 2002). Moreover, the above mentioned NGOs are likely to lobby hard for these activities. Recently these organizations are becoming worried that the decision to protect LSI from large scale development could be unraveled by a renewed interest in salt mining, resort development, and land speculation (Dedina & Aridjis 2002). However, involving NGOs in local management plans like the UMA is not without its risks as their objective for conservation might conflict with local development objectives.

7.3 Strategies to Improve Local Community Cohesion and Identity

The indicators used to analyze the impacts on local cohesion and identity from ecotourism generally showed improvements from 1995 to 2002. Albeit LSI remains a highly divided community. Some of the positive aspects include more tourism income invested for community purposes, more women employed in the local ecotourism industry, and an excellent relationship between residents of LSI and visiting tourists. The latter have helped strengthen local pride and identity. There have also been dramatic improvements in what was previous a very antagonistic relationship between residing tourism operators in LSI and the larger outside based ecotourism operator. A catalyst for this development has been a more acceptable allocation of permits and increasing levels of cooperation internally among tourism operators. Unfortunately, distrust still remains between these players as the conflicts over property rights remain unresolved. More problematic is the situation facing the settlers in El Cardon. These residents continue to be shunned from ecotourism jobs and permits due to their refusal to settle legally elsewhere in the Reserve, a very strained relationship with the tourism operator that has acquired the land, and their general lack of tourism experience and skills. Finding solutions that solves the historical land use conflicts and offers residents from El Cardon ways to gain more benefits from ecotourism developments are therefore key to improved community relations in LSI. Such strategies could be to:
• **STRATEGY 1: Renegotiate Land Settlement Between Long-term Residents and the New Owners** - Finding a solution acceptable to both the residents who have lost their land in La Fredeira and La Vase and the new owners who purchased it from the Eijido is important to avoid the conflict from flaring up again. One solution could be for the residents to buy back their land cheap from the new owners. According to the management of the Reserve it would be difficult for the new owner to reject such a suggestion because of the questionable privatization of the purchased land and these long-term residents' historical rights to the area. Moreover, the land only represents a small fraction of what the new owners would have to give up. Long-term residents are likewise more willing to pay for the land than risk losing their rights permanently to the land through the courts.

• **STRATEGY 2: Improve the Living Conditions of El Centro** – Residents from El Cardon continue to be shunned from accessing ecotourism benefits and jobs because of their illegal occupation of the area. This can only be resolved if these residents move to a different part of the Reserve as it is unlikely they will ever be able to obtain legal rights to the area. El Cardon’s is a wetland zone where settlements are excluded. Resident’s from El Cardon also have no historical rights to the area. Furthermore, the instances of poaching, drug smuggling and death threats stemming from this community have isolated these residents from sympathy and political support. One idea is therefore to offer these residents cheap land in the planned community of El Centro. Such a proposal was rejected in the late 90s by the residents of El Cardon because the inland lots of this location offered nothing in return for the direct ocean access, tourism possibilities and beauty of El Cardon. However, this attitude could change if El Centro’s infrastructure was improved to make it a more attractive place to live. This could be done for example by offering amenities like electricity, cheap housing, garbage collection, sewerage and easier access to drinking water. A very problematic element of this strategy is, however, the cost of such initiatives.

• **STRATEGY 3: Push for Ecotourism Development in El Cardon** – The estuary of El Cardon is one of the most scenic areas in LSI and offers tremendous potential for bird watching, kayaking and as alternative departure point for whale watching activities. One incentive for making the residents move to a different part of the Reserve could therefore be to promise them some of the benefits associated with the future tourism development of the area. This could for example be in the form of jobs, a share of the income, or permits to conduct their
own ecotourism operations. However, this is likely to be met with resistance from the tourism operator that has obtained exclusive ecotourism use rights to the area.

- **STRATEGY 4: Issue more Permits** – A quick way to redistribute income to locals not previously benefiting from ecotourism in LSI could be to issue more permits. This strategy was instrumental in solving some of the tension over access to ecotourism activities that existed between residing tourism operators and one of the regional operators in the mid 90s. However, such a strategy can only be defended in a rapidly growing market as it leaves room for new tourism operators to emerge without damaging the viability of existing ones. This is no longer the situation for LSI considering the recent stagnating visitor numbers; the underutilized capacity for existing whale watching permits; and the apparent weak financial situation of the tourism operators. Moreover, more permits could increase the whale watching impacts. A few viable tourism operators are therefore better for LSI than many small weak ones.

- **STRATEGY 5: Train Residents from El Cardon** – Most local residents from El Cardon have had no ecotourism work experience or any formal guide or language training. This limits their potential for employment. This problem could be offset if these residents were given better access to future ecotourism workshop and training programs in LSI.

### 7.4 Strategies to Improve Local Support for the Reserve

Support for the biosphere reserve of El Vizcaino within LSI has generally increased since 1994. A major catalyst for this increasing support has been the rapid growth of ecotourism as it has brought significant economic benefit, jobs and pride to the lagoon; improved the working relationship with the management of the Reserve; increased local influence over policy and management issues related to LSI; and raised local awareness of the positive linkages between ecotourism and biosphere reserves in sustaining local livelihoods, interests and the environment. Unfortunately, this is not uniformly expressed throughout LSI. The residents of El Cardon continue to show little support for the Reserve. This is not surprising considering their poor relationship with the management of the Reserve and some of the tourism operators over their rights to stay where they are. Increasing these residents’ support for the Reserve is unlikely without solving this stalemate. Strategies for doing so have already been discussed in the previous section on improving local community cohesion and identity. Generally, however, local support
for the Reserve and the tourism activities could be strengthened by making more effort to educate residents about what makes LSI significant as a world heritage site and biosphere reserve. This could be done by:

- **STRATEGY 1: Erecting more Signs** – There are few if any informative signs telling locals or visiting tourist that they are inside or approaching a world heritage site and biosphere reserve. This is a missed opportunity for educating local and visitors about the uniqueness of the area.

- **STRATEGY 2: Creating Special Community Events and Festivals Tied to the Grey Whale and the World Heritage Site** – The new community center provides an excellent opportunity for informing locals more about the activities of tourism operators and the managers of the Reserve (Moreno 2002). This could be in the form of meetings or educational seminars. Tourism operators and the management of the Reserve could also help sponsor and arrange more informal events - like festivals - that celebrates the world heritage site and the whale. Experiences from other whale watching communities show that such events can help raise not only local awareness conservation and ecotourism activities but also help to boost community cohesion and attract visitors (Hoyt 2002).

- **STRATEGY 3: School Programs for Children** – Wildcoast and other NGOs are already supporting a number of conservation activities related to turtle conservation in the local schools of LSI (Dedina 2002). These could be enhanced to include other relevant biosphere reserve issues.

### 7.5 Strategies to Improve the Viability of the Tourism Operators

The indicators used to evaluate the viability of the local and regional tourism operators indicated that they generally have become more competitive from 1994 to 2004. One explanation is that all tourism operators have seen their revenue and visitor numbers grow more rapidly than the upscale foreign camps and tour boats. This reflects a shift in demand towards more tourists arriving on their own. Another reason is that tourism operators have begun to operate their own camps and offer value added package tours that makes visitors spend more money in the lagoon (Fischer 2002a; Young 2002). Improvement in the camps and the skill levels of the tourism operators are also factors that have helped tourism operators improve their competitiveness (Dedina 2002).
very good sign is also the very positive perception visitors generally have of the tourism operators’ service, food and whale watching activities. It is, however, important to point out that not all tourism operators have been equally successful.

Two operators out of the five included in the survey employed generated 76% of the local and regional ecotourism revenue in 2002. These two companies also employed 77% of the workforce involved with ecotourism in LSI. Their success can be contributed to a number of factors including (i) better ecotourism business skills; (ii) the offering of lodging and package tours; (iii) more marketing activities; (iv) superior sale channels; (v) internet access; and a (vi) favourable historical distribution of permits.

Unfortunately most ecotourism companies made less than a few thousand dollars in profits in 2002. These low levels of profits continue to make the ecotourism industry in LSI vulnerable to unforeseen events, like fluctuations in visitor levels (Moreno 2002). Low profits have also made it difficult and risky for the ecotourism companies in LSI to invest in new activities or improve the existing ones (Dedina 2002). A major constraint is that profits are likely to be squeezed further in the near future considering the recent stagnation in visitor numbers, the proposed ecotourism tax and rising gasoline prices. Tourism operators must therefore focus on a number of strategies that can stimulate growth and raise profits. This can be done by increasing the number of visitors, stimulating visitor expenditure, and cutting operating costs. Some practical suggestions to do so are discussed below.

7.5.1 Better Promotion
Promotion is an essential part of any marketing activities to increase visitors (Kotler 2002). In an ecotourism context typical media for promotional activities include newspapers, traveling magazines, classified advertising, direct mail, flyers, newsletters, brochures, outdoor advertising, trade shows, and other public relation activities. These media vary in flexibility, cost, level of information that can be conveyed and how easily results can be tracked (Briggs 2000). Notably, so far most of the companies in LSI have done very little to promote their activities. More and better targeted promotion activities are therefore likely to have a positive effect on sales. Some of the most likely options for doing so follow:

• STRATEGY 1: Distribute more Flyers in the Gateway Community of San Ignacio – Few of the tourism operators in LSI have been using flyers to attract visitors. This is surprising
considering that flyers are relatively inexpensive to produce and easy to distribute to people already visiting San Ignacio (Briggs 2000; Kotler 2002; Witt & Moutinho 1994). This can for example be done as handouts on the street or at hotels.

- **STRATEGY 2: Send Newsletters to Repeat Visitors** – Most tourism operators in LSI have many repeat visitors. However, attracting even more of these visitors could possibly if newsletters were sent out to them on a regular basis. Such newsletters are often very effective as a sales tool (Briggs 2000; Kotler 2002; Witt & Moutinho 1994). They help maintain contact with regular customers without pressuring them. They also strengthen a company's credibility and image. However, newsletters can be expensive to make if professional help is needed to write and design them (Kotler, Bowen, & Makens 2006). It might also be an inefficient use of resources if the numbers of regular customers are small. On the other hand distribution costs can be very low and fast if newsletters are send out as email messages. Moreover skills are needed to build and maintain a database of contacts (Kotler, Bowen, & Makens 2006).

- **STRATEGY 3: Brochures** – This form of marketing has the advantage that it provides in depth information about tourism products and services. However, they are expensive to make, to print, and can be unnecessary if distributed to people who have not expressed interest in ecotourism. They also need to be continuously updated in terms of product information and pricing. Consequently, brochures might only be useful especially for tourism operators who want to target more upscale costumers abroad.

- **STRATEGY 4: Ensure all Tourism Operators have well Functioning Websites** – Only 2 out of 5 tourism operators had a company website in 2002. For the companies without a website this represents a significant loss of sales and marketing opportunity. A problem that is likely to intensify as ecotourism visitors increasingly are relying on the web to get detailed travel information and book tours quickly (Kotler, Bowen, & Makens 2006). Moreover, the information is global in reach. Unfortunately, websites are costly to build and maintain, and must get indexed properly in the search engines so visitors can find and access the information (Mader 1999). Furthermore, most tour operators lack the necessary computer skills and access to internet in the lagoon (Dedina 2002). These barriers are crucial to address if some of the smaller tourism operators in LSI are to remain competitive.
• **STRATEGY 5: Improve Outdoor Advertising** - Raising a number of large whale watching billboards along Highway One prior to entering San Ignacio is a very cost effective way to attract more whale watching tourists. Such signs would be highly visible from passing cars due to the sparse desert vegetation. This would alleviate the problem that LSI is easy to miss as a whale watching destination for the unaware, but potentially interested tourist travelling by car. The effect of signs could be enhanced if they were coupled with an information booth / visitor platform with info concerning the uniqueness of the whale watching activities in LSI; the significance of the area as a world heritage site; and contact information and directions to the various tourism operators (Dedina 2002).

• **STRATEGY 6: Conduct Promotions through Guidebooks and Specialty Magazine** - Many of the tourism operators have overlooked the value of getting publicity from guidebooks and specialty travel/outdoor magazines. Not only is this kind of promotion often free, but it also targets the people likely to be interested in ecotourism activities. Information found in these publications also builds company credibility as it is perceived favourable by readers (Kotler 2002). Bad reviews can therefore have long-term negative demand. So visitors’ experiences need to be consistently of high quality. Getting more promotion through guidebooks and specialty magazines is also time consuming and requires good public relation skills (Kotler, Bowen, & Makens 2006).

• **STRATEGY 7: Advertise in On-line Travel Directories** - These portals have the advantage that they can specifically target people interested in ecotourism, Baja or whale watching activities. They can help market local ecotourism activities and are often capable of cross linking to the tourism operators own website (Kotler, Bowen, & Makens 2006). This cross linking helps improve the ranking of websites in the search engines like Google. However, using on-line travel directories can become expensive as each typically charges $150-200 a year. Finding the right ones and keeping the info updated requires some computer skills and awareness of which sites potential clients visits (Kotler, Bowen, & Makens 2006). This is knowledge most of the tourism operators do not yet have (Dedina 2002). A feasible idea would be for some of the NGOs involved in LSI to assist operators obtaining this.

• **STRATEGY 8: Increase the Number of Tourism Operators with Ecotourism Certification** - So far only one company in LSI has chosen to become a certified ecotourism operator. It might be beneficial for other tourism operators to do the same. Certification is likely to
increase sales, because it gives visitors the assurance that a ecotourism operation’s products and services meets specific standards (Honey 2002). However, as ecotourism certification is a relative new phenomenon its value has yet to be established (Medina 2005). Certification can be both costly and time consuming to acquire and requires renewal (Honey 2002).

7.5.2 Better Diversification of Tourism Products

Most companies in LSI have made efforts to diversify their tourism activities. These activities include kayaking, bird watching, mangrove tours, cave painting excursions and camps for school children. Unfortunately, most of these activities have been insufficiently developed and fall within the existing short whale watching tourism season (Nations 1999; Spalding 1999). It might be possible for tourism operators to increase their revenue by adding products that extend the tourism season, encourage tourists to spend more time in LSI and increase visitor numbers (SEMARNAP 2000). Growth from successful diversification can have a positive impact on local employment and help offset the problem of too many people trying to make a living from offering identical activities. However, diversification can be risky if it requires large new investments in equipment or if tourism operators need new skills to conduct the activities (Kotler, Bowen, & Makens 2006). For some ecotourism operators in LSI it might therefore be better to improve existing activities than pursuing new opportunities. A workshop focusing on options for diversification involving people with such experiences could therefore be helpful. Some obvious ideas for diversifying tourism activities in LSI include a strengthening of bird watching, kayaking activities, cacti tours, sport fishing ones and the addition of unique adventure tours/photo safaris:

- **STRATEGY 1: Birding** – To date more than 220 bird species have been observed in LSI (SEMARNAP 2000). Some of these are rare and threatened and live permanently inside the Reserve. Charismatic nesting species include the white pelican (*Pelecanus erythrorhynchus*), the peregrine falcon (*Falco peregrinus*), ospreys (*Pandion haliaetus*), the snowy plower (*Charadrius alexandrinus*), the least tern (*Sternula antillarum browni*), the black vented shearwater (*Puffinus opisthomelas*) and the Leach’s storm petrels (*Oceanodroma leucorhoa*) (Robles Gil & Berger 1998). LSI should therefore have a very high potential for attracting birders that is another fast growing segment of nature tourism (Cordell 1999). Such potential could be enhanced by building hides and viewing platforms; linking to bird websites and involving bird clubs abroad to organize tours. To benefit from these possibilities tourism operators would need to upgrade their skills concerning ornithology. However, little new equipment needed to conduct such tours. Birding in LSI can also be conducted year round,
but the best seasons are spring and autumn when the lagoon becomes an important migratory stop for thousands of shorebirds and waterfowl (Robles Gil & Berger 1998).

- **STRATEGY 2: Kayaking** – This activity is currently being offered by some of the tourism operators, but only as part of whale watching package tours. However, it could easily be offered as a separate activity as the calm waters and channels inside LSI provide fantastic opportunities for kayaking excursions to see mangroves, birds, turtles and remote swimming beaches year round (Dedina 2002). Investments in new equipment are minimal. However, tourism operators need to do more to promote this activity outside the season.

- **STRATEGY 3: Cacti Tours** - Despite the harshness of the surrounding desert, the Reserve, has the highest concentration of plant species on the peninsula. Of Baja California’s 110 cacti species, 80 are found nowhere else (Robles Gil & Berger 1998). Tourism operators should therefore have good possibilities for offering interesting botanical tours in the area around LSI. Such trips require little investment in equipment as most tourism operators own 4x4 trucks or can arrange for mules suitable for the purpose. However tourism operators would have to gain more knowledge about the flora and where to most interesting species to focus tours to specific areas.

- **STRATEGY 4: Sports Fishing** – LSI provides some sports fishing opportunities for bass and groupers outside the whale watching season. Better opportunities exist outside the lagoon mouth for catching bigger game fish like yellow fin tuna (Aquilar 2002). However, investing in bigger boats with covered decks will be necessary if tourism operators are to take advantage of the latter opportunity. The small pangas used for whale watching activities provide insufficient comfort and safety from the rugged open sea and the sun during the summer season when fishing is the best (Dedina & Young 1995).

- **STRATEGY 5: Unique Adventure Tours / Photo Safaris** – The above ideas for diversification of activities also provide unique possibilities for creating new and exciting package tours that combine many of the elements to create unique outback tours or photo safaris.

7.5.3 **Upscaling of lodging facilities**
Many ecotourism operators are increasingly moving upscale to offering more luxurious accommodation, food and services (Buckley 2003). While most tour companies in LSI have
made significant upgrades to their camps they remain relatively rustic. Consequently, the older camp facilities in LSI might therefore increasingly be perceived as unsatisfactory by future visitors. However, some improvements can cheaply and easily be implemented in some of the camps:

- **STRATEGY 1: Use Local Materials** – Locals often use palm leaves as a mean to build roofs (Moreno 2002). These are inexpensive materials, and can give buildings a charming, unique and beautiful look. Using these materials, which are readily available in LSI, could be a simple solution to replace some of the camps use of plywood or corrugated plastic (Marcer). The big piles of abandoned clams shells leftover from the overexploitation of clams in the 80s could likewise be incorporated into make interesting walls (Dedina 2002).

- **STRATEGY 2: Make Windows Facing the Sea** – Some of the tourism operators have huts without windows facing the sea. This is problematic as this is a feature important most visitors expect (Dedina 2002). Getting a breeze from the sea is also likely to make huts more comfortable.

7.5.4: Increase prices

LSI has become of the world most renowned place for whale watching ecotourism. Reasons include the lagoons high concentration of friendly whales, its pristine unspoiled nature, and its world heritage designation. It might therefore be possible for tourism operators in LSI to increase their prices on some of their products and services without any significant loss in the number of visitors. In fact higher prices can sometime increase demand, because people perceive the activity or product offered to be of higher value than before (Kotler, Bowen, & Makens 2006). Unfortunately little is known about the price elasticity of whale watching activities in LSI (Lopez 2002). Tourism operators are therefore generally afraid to increase prices as they believe the poor access road and distant location of LSI makes it difficult to price ecotourism products more expensively than the other Mexican grey whale watching locations. What is more, tourism operators in LSI have already increased their prices on day tours to alleviate the impacts of the new ecotourism tax in 2002. Finally, visitors’ expectations of services and amenities offered are likely to increase with higher prices. Increasing prices might therefore necessitate costly improvements to the tourism operators’ camps, amenities and services.
• **STRATEGY 1: Initiate a Study to Evaluate the Price Elasticity of Whale Watching Activities in LSI** – As the price elasticity of tourism goods and services is unknown in LSI it might be a good idea to initiate a study to examine how changes in price would affect demand. Both ARIC and the management of the Reserve is likely to support such an idea.

7.5.5 *Reduce Cost*

Some of the tourism operators may be able to become more financially viable by finding ways to reduce their operating costs. Yet, such measures must not degrade the quality of the ecotourism services and products offered as it could have negative impact on visitor demand for local tourism activities. Cutting staff and salary levels is therefore an unlikely option considering the small size of the ecotourism operators in LSI and the increasing visitor demand for better services. A more promising option is to focus on reducing the operating costs of boats and camp facilities. These represent a very large share of the tourism operators’ overhead.

• **STRATEGY 1: Continue to Replace 2-stroke Outboard Engines with more Economical and Environmentally Friendly 4-stroke ones** – Four stroke outboard engines are much cheaper to operate. They use 30% less fuel, operate without oil mixed into the gasoline and outlast 2-stroke engines. (Fischer 2002a). Unfortunately, 4-stroke outboard engines were approximately 40% more expensive to purchase in 2002. They are therefore initially more costly to use. Changing the engines in LSI therefore only makes sense economically if the old 2-stroke engines have to be replaced or tourism operators can use them for fishing purposes outside the tourism season. Estimations show that doing so would save tourism operators approximately $2,700 to $26,000 per engine over a five year period (See Table 24). It will therefore be advantageous for most of the tourism operators to speed up the process they started in 2002 to replace their 2-stroke engines.
Table 24: Cost Savings Replacing 2-stroke with 4-stroke Outboard Engines in LSI 2002

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Estimated point in time when total cost of 4-stroke engine becomes less than 2-stroke one</th>
<th>Total Savings in US $ using 4-stroke engine after 5 years of use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buy new 2-stroke or 4-stroke (Used for tourism purposes Only)</td>
<td>&gt;2.2 years</td>
<td>$2,671</td>
</tr>
<tr>
<td>Buy new 4-stroke or keep existing 2-stroke (Used for tourism purposes Only)</td>
<td>&gt;8 years</td>
<td>-$3,040</td>
</tr>
<tr>
<td>Buy New 4-stroke or new 2-stroke (Used year round for tourism as well as fishing purposes)</td>
<td>&gt;0.5 years</td>
<td>$26,000</td>
</tr>
<tr>
<td>New 4-stroke or existing 2-stroke (Used year round for tourism as well as fishing purposes)</td>
<td>&gt;1.5 years</td>
<td>$20,000</td>
</tr>
</tbody>
</table>

Source: Peter Agersted (2002) – See appendix 2 for detailed calculations

7.5.6 Look for Funding to Enhance Future or Existing Tourism Activities.
Lack of capital and limited access to cheap loans continue to be substantial barriers for tourism operators. As a result some of the tourism operators can only slowly improve their camps, invest in new equipment, improve their promotion activities; and diversify their tourism activities. Some of these barriers could possibly be addressed by looking for funding e.g. from the Mexican government; environmental foundations and trust funds; or from finding new business partners.

- **STRATEGY 1: Apply for Funding through the Mexican Government** – According to some residents of LSI loans with low interest or subsidies are sometimes available for rural development projects. Priority to these loans and funds is often given to the Mexican communities in most need (Danemann 2002). It is uncertain to what extent tourism operators can get access to these available, but hard to get funds. However, such possibilities should be examined through close cooperation with the managers of the Reserve. It represents LSI and the tourism operators at the federal level. In addition, tourism operators could benefit from teaming up with NGOs to learn more about how to prepare successful funding proposals e.g in the area.

- **STRATEGY 2: Establish Ties with Environmental Foundations / Trust Funds** – Tourism operators entered in 2002 a partnership with the US based NGO “The Ecologic
Development Fund” to obtain cheap loans for the replacement of its outboard engines (Lopez 2002). ARIC was able to do so because it presented a cost benefit analysis that demonstrated significant environmental and economic gains from replacing the tourism operators’ old outboard engines with new ones. It might be possible to find other attractive projects. Examples of these could e.g. be funding for a community windmill, land fill or the suggested UMA.

7.5.7 Develop Business Partners
Another potential alternative for the tourism operators to get funding and strengthen their capacities is to develop strong partnerships with outside enterprises. Such partnerships can take many forms and can create various degrees of integration between players. While partnerships are likely to increase economic leakage and a dependence on outsiders, they can e.g. also help strengthen capacities too costly or difficult for local stakeholders to obtain by themselves. Partners will often assume some of the financial burden related to administration, marketing and sales activities used to attract tourists in return for a commission or a share of the profit. Partnerships can help reduce the financial risk to local vendors. One example is the advantage a local tourism operator might obtain from partnering with a tourism agency abroad. Such an agency could provide the needed administrative skills, marketing clout and human resources. A proper partner is also likely already to have an appropriate clientele interested in ecotourism tours. For most ecotourism operators, such access and skills would be impossible to acquire without a strong partner, because it would involve big investments abroad. However, it must be stressed that while partnerships can be very desirable, establishing a well working relationship can be very difficult - especially across cultures. Typical causes of failure include the inability to find a good partner, communication problems, lack of trust, and contractual disagreements.

7.5.8 Improve the Ecotourism and Business Skills of Tourism Operators.
The ecotourism skill levels of local tourism operators have generally improved from 1994 to 2002. One factor is simply the experience all tourism operators have accumulated from a decade of involvement with ecotourism development. Moreover, the guide training courses conducted by RARE have helped improve tourism operators’ skills in terms of the natural environment, English, and hospitality management. That said, the business and the foreign language capacities need to be strengthened. This is particular true among the smaller tourism operators.
• **STRATEGY 1: Provide more Training Courses** – One way to improve the skills of local tourism operators and their employees is to provide more intensive training courses. However, besides English courses such courses should do much more to emphasize business planning, marketing, product development and internet use, as these are aspects where local tourism operators could benefit dramatically. Involving RARE again would be one feasible way to implement such courses, as they already have a good working relationship with VIBERE, ARIC and LSI.

• **STRATEGY 2: Feedback from Visitors** – Some of the tourism operators have currently little awareness of how they could improve their activities. Simply asking visitors about their experiences is a fast and inexpensive way to get important feedback. This could be done formally through surveys or questionnaires, or informally through talks after the whale watching tours (Kotler, Bowen, & Makens 2006).

• **STRATEGY 3: Guide Training Manual** – It is unlikely that all staff and locals will ever have access to ecotourism training courses. They can be costly to run and time-consuming to attend. However, it should be possible from the previous training material to replicate or adapt some of the training manuals. This would make it easier for staff to refresh or gain new ecotourism knowledge. Such manuals have the advantage that they can easily be updated or improved.

• **STRATEGY 4: Offer Internships and Study Possibilities for University Students** - Another way for tour operators to gain new insights and improve their ecotourism skills could be to partner with universities in Mexico and California wanting to study ecotourism or provide internship possibilities to their students.

### 7.6 Management Implications

The preceding section has shown that many possibilities exist to alleviate some of the negative impacts, as well as increase the economic benefits associated with ecotourism development in LSI. However, tourism operators will most unlikely be unable to implement many of these strategies alone as they require additional knowledge, skill and political influence. It is therefore crucial that the management of the Reserve and the NGOs in LSI continue to support the tourism stakeholders with training, expert advice, access to funds and lobbying efforts. The most
important barriers to the future development of ecotourism of LSI are the land use conflict and tour operators’ skill levels. Once they are addressed implementing the above strategies will be much easier and ultimately result in increased demand for ecotourism activities and higher levels of socioeconomic benefits in the community of LSI.
8 Conclusion

8.1 Questions Asked and the Overriding Answers to Them
To address human-induced threats to Mexico’s 26 biosphere reserves, ecotourism is increasingly being used as a strategy to promote more sustainable development within these areas. However, if not implemented cautiously, ecotourism can create both negative environmental and socio-economic impacts. It is therefore important to evaluate existing ecotourism activities in the Biosphere Reserves, not only to identify how to mitigate their possible negative impact, but also to identify ways to increase the socio-economic benefits from such development activities in a sustainable fashion.

A case study approach was applied to examine the socio-economic impacts of whale watching tourism in the Laguna San Ignacio (LSI) World Heritage Site, which is located within the El Vizcaino Biosphere Reserve in Baja California Sur, Mexico. It is an area where ecotourism activities have been grown rapidly over the last 15 years, but also where the socio-economic impacts from such development remain uncertain. Hence, the specific objectives of this case study were to examine:

1. How existing ecotourism operations and their activities in the LSI have changed since 1994;
2. Whether these changes have made ecotourism a more viable socio-economic development alternative for the local communities; and
3. Which strategies may be useful in overcoming identified barriers to further socio-economic benefits both from existing and future ecotourism activities.

Overall, thirty-six indicators were used to examine five socio-economic parameters commonly used to evaluate ecotourism activities. The first four parameters examined changes in benefits during the period of 1994-2002 from the perspective of the local communities. The 5th parameter was applied to look at the viability of the five local and regional whale watching companies operating permanently in the Lagoon.

8.1.1 Observed Changes to Ecotourism Operations and Activities in LSI since 1994?
During the review period from 1994 to 2002, whale watching activities in small boats continued to be the main ecotourism activity in LSI. Throughout this period it was the same three local and two regional tourism operators who were involved in these whale watching activities. They serviced one or more of four distinct whale watching tour segments found in LSI: half-day or day
trip tours; overnight packages based out of whale-watching camps; and outsourced guide services to two foreign camps and 7-12 tour boats (liveaboards). Visitors also continued to come mostly from the U.S. and Mexico (respectively 72% and 26% in 2002). Yet the ecotourism activities in LSI underwent several changes:

**Economic changes:**

*Demand initially increased, but then stagnated* - The number of whale watching visitors in LSI grew from 2,200 to 4,000 between 1994 and 2001, but dropped to 3,300 passengers in 2002. Two exogenous events had a significant influence on this development. The ESSA/Mitsubishi's proposal to build an industrial salt factory close to LSI led to massive worldwide protests from 1995 to 2000. This led to influx of many NGOs that came to LSI to do development work; visits by many prominent people including famous Hollywood actors and the Mexican president and massive media exposure in the U.S and Mexico. These events likely had a positive effect on whale watching demand as they transformed LSI from being a relative unknown whale watching location to one recognized at the global level. The other event, the 9-11 attack in 2001, had the opposite effect as many visitors chose to stay home rather than travel abroad.

*Day tours and overnight stays became more prominent* - Between 1994 and 2002 the structure of the market for whale watching activities changed significantly as more visitors arrived overland by car on their own than by boat. During this period the combined number of people who bought a day tour or who purchased a package tour in LSI grew from 48% to 80% of the visitors (compared to tour boats that saw their number fall from 48% to 8% and foreign upscale camps whose market share declined from 16% to 12% of visitors). As a result of the decline in tour boat visitors the total revenue generated by local, regional and foreign tour operators fell from approximately US $3.3 to $1.8 million between 1994 and 2002. However, because of the strong growth of day and package tours this had little impact on the revenue of the local and regional tourism operators, who saw their income increase from approximately $150,000 to $260,000.

*More staff hired by tour companies to service tourists on land* - Eco-tourism jobs in LSI doubled from 34 to 68 between 1994 and 2002. Notably only the three companies with camps hired this additional staff, which reflected a need to service the increasing number of overnight visitors. Women's share of these jobs also increased from 15% to 31%.
Political changes:

*LSI saw more management staff involved in ecotourism local activities* - The local tourism operators saw in the mid 90s an unprecedented level of staff visiting from the biosphere headquarters. This reflected a number of issues. For one the biosphere’s headquarters was moved much closer from La Paz to Guerrero Negro. More funding was also secured for staff and on the ground development activities through the Global Environment Facility (GEF). The Reserve’s first Management Plan was also published. This led in the mid 90s to increasing numbers of initiatives to involve locals more in the management of ecotourism development. This cooperation increased the number of whale watching permits from 16 to 27 giving local operators much needed capacity. Local tourism operators also became instrumental in the design of new whale watching guidelines in 1997.

*The tourism operators established a tourism union* – Local tourism operators established in 2000 the local tourism union ARIC. Initially established to avoid cutthroat price competition and settle conflict among the tourism operators, the organization have since assumed additional responsibilities. It has for example been given the rights to use visitor fees originally destined for the management of the Reserve. ARIC has also become a member of VIBERE’s technical council, which addresses matters such as development problems and conservation issues inside the Reserve. The organization’s work has also led to increasing cooperation internally among the local and regional tourism operators as it has coordinated a number of activities that tourism operators previously undertook as individuals such as permit renewals.

Company specific changes:

*Package tour operators experienced the biggest growth* - The two companies who offered package tours out of their camps experienced the biggest growth. The combined number of their employees more than doubled from 22 to 55 to accommodate an increased need for people to service tourists in the camps. Data also showed that the two companies with package tours serviced more than 50% of the approximately 3300 people that went whale watching in 2002. In terms of revenue this amounted to approximately 75% of the $260,000 generated by all the tourism operators. The estimated revenue numbers were however considered relatively uncertain because of the many assumptions that had to be made concerning the tour prices.
Camps expanded and became better organized - To make it more attractive to stay the package tour operators upgraded and expanded the capacity of their camps significantly. One did do so by building 12 cabanas; while the other purchased 8 quality safari tents. In 2002 these camps charged approximately $135 to $250 for an all inclusive one night stay including whale watching, food and other activities. The remaining operator, who offered lodging, would in contrast charge $10-15 a person offer for one of his two basic sheds. Repeat visitors remarked that camps had become tidier, cleaner and had more common dining area facilities than before. However, they also noted that the camps still remained rustic.

Package tours operator began to diversify their products and improve their sales activities - In addition to whale watching, lodging, food, transportation and souvenir sales package tour companies also began to offer kayaking, cave paint painting tours, mangrove excursions, children camps throughout the 90s. But these activities were mostly offered as part of all inclusive package tours during the whale watching season. Moreover, their sales and marketing expanded to use websites to promote and sell their tours in the new millennium. They also expanded their reach by setting up contact numbers and sale offices elsewhere.

8.1.2 Have these impacts been positive or negative?

The investigation suggested that the benefits from ecotourism improved significantly in many areas between 1994 and 2002. However, the results also suggested that some negative impacts and barriers remain to be addressed and mitigated.

Economic Impacts

The indicators used to analyze the economic impacts from ecotourism in LSI showed that both local and regional benefits have increased dramatically. From 1994 to 2002, visitor numbers increased almost 50%, employment 100% and local and regional revenue almost 75% (or 55% in real terms adjusting for inflation). The factors behind this positive development were a strong growth in visitors arriving on their own, combined with the improved ability of some of the tourism operators to sell overnight stays and package tours. The indicators also revealed that working in the ecotourism industry in LSI was considered highly attractive, because these jobs were better paid, involved shorter hours and were safer compared to the ones in fishing. This was particularly true for the 24 people working as whale watching guides and skiff drivers. In 2002, their salaries averaged between $700-800 a month. This amount was 2-3 times higher than the
pay of the typical local fishing jobs and 6-7 higher than the minimum wage of unskilled workers in Baja California, Mexico.

Despite these positive developments, ecotourism activities are still far from fulfilling the El Vizcaino Biosphere Reserve management’s goal of turning these efforts into a viable economic alternative to the depleted fishing resources in the lagoon. Only 14% of the local adults from LSI were involved with ecotourism, as almost half of the workforce was from other communities outside LSI in 2002. Furthermore, tourism income continued to be available for only 3-4 months of the year. Ecotourism has therefore not led to any significant reduction in the reliance on local fisheries for income. However, for the people, who worked both as guides during the tourism season and fish during the rest of the year, ecotourism accounted for 50% of their annual income in 2002.

Ecotourism activities did not help finance the Reserve’s administration cost associated with its development. LSI is therefore likely to experience increasing demands to do so as it is clearly stated goal in the Reserve’s management plan that the management of tourism activities has to be self-financed.

Even more worrisome is the recent decline in visitor numbers from approximately 4,000 to 3,300 visitors between 2001 and 2002. The most likely reason for this development was the 9-11 terrorist attack and the subsequent decline in visitor numbers in the spring of 2002. Yet, it might also mask the fact that LSI is no longer getting the same extensive media exposure from newspapers in the U.S and Mexico, as it did during the period from 1996 to 2002, when NGOs were fighting a proposal to expand its salt extraction facilities in the biosphere of El Vizcaino. LSI may therefore face further declines in visitor numbers, unless more is done to stimulate demand. A lack of such stimulation could seriously affect the future growth potential and viability of the local ecotourism industry – especially considering the Government of Mexico’s recent proposal to implement a new ecotourism tax.

Impact on Local Community Cohesion and Identity
At present there are many signs of improving community cohesion at LSI. Visible signs of this development have been a decline in conflicts related to tourism access and permits, strengthened ties between tourists and the visitors, increasing economic and political empowerment, and more pride in the Reserve and its resources.
Tourism income today is not only larger, but also more widespread as more jobs have been created, salaries have increased and the income of the tourism operators has gone up. Another positive sign is that more women are becoming involved in the ecotourism industry, as fisheries-related jobs continue to be reserved primarily for men. Moreover, increasing effort made by tourism operators, the management of the Reserve and NGOs to support community projects and improve local services has also benefitted the sense of cohesion. Yet, some of the most noticeable improvements are related to the building of a secondary school, the availability of a doctor throughout the tourism season, the cleanup of scrap metal and the construction of a community center. The growth in ecotourism activities is also likely to have had an influence on the emergence of a few small stores that sell basic commodities and drinking water. In general, since 1994 the quality of life has therefore improved for many of the lagoons residents.

The analysis also showed that ecotourism and fisheries activities continue to co-exist. In fact, the changes to the biosphere and ecotourism regulations from 1997 have granted local fishers better access to their livelihood, as they have exclusive rights to fish inside a 5-mile zone from the coast. Likewise, the restrictions to use traps and lines inside the lagoon during the whale watching season has been lifted.

Another telling factor is that the relationship between residents and visiting tourists continue to be excellent. In fact, the high number of repeat visitors, donations and the tourists’ general expressed awe for the nature, people and whales in LSI has helped strengthen local pride and identity. An additional catalyst for this development has also been the visit of the many high-profile people, including famous Hollywood actors and the Mexican president associated with the proposal to expand it salt extraction facilities.

There have also been dramatic improvements in the previously very antagonistic relationship between residing ecotourism operators in LSI and the larger regional-based ecotourism operator. Important catalysts for this development have been (i) a more acceptable allocation of permits among the existing tourism operators; (ii) increasing levels of internal cooperation among tourism operators; and (iii) increased local influence over whale watching guidelines and the establishment of the tourism union ARIC. As a result, ecotourism operators now meet regularly to resolve issues and problems, while socializing at each others’ premises – actions, which would
have been unheard of in the mid 90s. Yet, distrust still remains between some of the ecotourism operators, as historic conflicts over property rights remain unresolved.

A more serious negative impact on social cohesion is related to the situation facing the illegal residents of El Cardon. Their refusal to move elsewhere has led to a disastrous relationship with the management of the Reserve and the operator that now claims the land, on which they live. Hence, for more than a decade, this dispute has isolated these residents from access to ecotourism permits, jobs, training and political influence. As a result, these illegal residents are becoming increasingly frustrated and disillusioned with the biosphere reserve and the development of ecotourism activities.

**Impact on Decision-Making Influence over Matters Related To Ecotourism and the Biosphere Development**

In LSI there are significant signs of such empowerment as ecotourism stakeholders have gone from having little to considerable influence between 1994 and 2002. Signs of such influence were notable in the extent of local involvement in the revision of the management plan and whale watching regulations. Tourism operators now work closely with VIBERE in determining the number of permits. They have also become permanent members of the Reserve’s Technical Council, which advises management on current or future issues related to the biosphere that needs to be addressed. In addition, tourism operators have been granted the rights to collect and spend visitor fees originally destined for VIBERE. As a result of these decision-making changes, a strong synergistic relationship has emerged between the management of the Reserve and the local tourism operators. In comparison with the 1994 situation, this partnership is very different, as local tourism stakeholders were treated as passive beneficiaries and had little or no trust in VIBERE’s management.

The catalysts behind these changes are a number of inter-related factors. An important one is the dramatic shift in Mexico’s protected area policies that took place in the mid 90s. The new policies recognized the need for more community involvement, decentralized management policies, along with the need for more economically sustainable ecotourism development. From an organizational point of view, it was also important that VIBERE’s headquarters was moved to Guerro Negro from La Paz, combined with the fact that more funds were allocated for on-the-ground work. These developments made it possible for VIBERE to communicate better and more regularly with local residents.
In LSI, the pace of these efforts were undoubtedly speeded up, because the Mexican government came under scrutiny to ensure the world’s stakehold that the perceived threats to the lagoon’s grey whales from the proposal to expand the salt extraction facilities were taken seriously. This led to an influx of local and international NGOs that over time - together with VIBERE - has assisted local ecotourism stakeholders in getting better skills and more confidence to become politically involved and to cooperate more with each other.

The establishment of the tourism union ARIC is another strong sign of this development. Since its creation, this organization has gradually become a very influential forum, through which tour operators can raise questions, have their ecotourism concerns dealt with and provide influence. Unfortunately, ARIC is perceived by some NGOs and community members as having a self-interested leadership that does not seek the advice of other community groups. This perceived lack of transparency has raised some concerns that the organization is working solely to secure its own interests. This might also be a contributing factor in explaining why the management plan (UMA) suggested by tour operators was rejected in 2002.

Impact on the Local Support for the Biosphere Reserve.
Local support for the biosphere reserve increased during the study period. Prior to 1994, few local residents knew about the Reserve - and those who did, expressed their doubt about its purpose. By 2002, this situation had changed, as local indifference was replaced by widespread support and a growing recognition of the positive synergies that was created between the biosphere and ecotourism development. The strongest indications of this attitudinal change were measured in the ecotourism operators’ efforts to become more actively involved in the management, monitoring and conservation of the biosphere reserve. In addition, other locals have also become more involved, as witnessed by the setup of a new local environmental NGO. Moreover, increased support for the Reserve was reflected in better compliance with VIBERE’s tourism rules and regulations. Finally, the ecotourism operators also noted that illegal fishing and turtle poaching activities were beginning to decline slowly.

Behind this growing support for the biosphere reserves lies a number of factors, with the most important being (i) the acknowledged growing economic importance of ecotourism; (ii) the educational work and training courses conducted by foreign NGOs; (iii) the increasing local
involvement in the politics of the Reserve; and (iv) a vastly improved relationship with the management of VIBERE (Dedina 2002; Lopez 2002; Sanchez 2002).

Despite these improvements, the case study analysis showed fishers from El Cardon had much less enthusiasm for the Reserve, than the other settlements in LSI. This is not surprising, considering that these residents to date have benefitted little from the ecotourism development. As a result, there is a continuing poor relationship between them and the management of VIBERE and the largest tourism operators—primarily because of their illegal status. Their indifference could also be attributed to the fact that during the 1990s, efforts to inform local residents about the benefits of the Reserve focused almost entirely on children or the stakeholders already involved with tourism activities in LSI.

Impact on the Viability of Local Tourism Operators
In LSI, the analysis revealed that the overall viability of the local and regional ecotourism operators improved between 1994 and 2002. This was indicated by their strong growth (in visitor numbers, revenue and employees), combined with their gain in market share from the foreign camps and tour boats (both in terms of visitors and revenue). Another strong indicator was the very high rate in satisfaction expressed among visitors and the high rate of repeat visitors.

A further analysis of these numbers showed that it was the two companies, who made the critical transition to sell more package tours and overnight stays. Contributing factors to their success were: (i) efforts to improve and expand their camps; (ii) their use of the internet as a sales and marketing tool; and a (iii) diversification of their products and services to make people stay longer and pay more. However, it was also evident that having a dedicated sales office outside LSI played a crucial role in this transformation. It allowed tourism operators to reach more potential clients and service them directly, either in person or through email, telephone and fax. Notably, one of these companies was identified by E-magazine as one of the world’s top ten ecotourism companies in 2002. This was a reflection of the preceding changes and achievements. In 2005, this company also became the first in the world to be certified by Green Globe under the International Ecotourism Standard (IES) (TIES 2005).

In contrast, the three remaining ecotourism companies did little to diversify their products, services and sales infrastructure, as they chose to focus almost entirely on servicing day visitors between 1994 and 2002. This strategy could be justified, because of the strong growth in day
visitors in the 1990s. However, considering the recent decline in visitor numbers; the fixed low prices of day tours; raising operating costs and the proposed ecotourism tax these companies face stagnation or possible declines in their revenue if they continue the status quo. This poses a threat to the already small profit margins of these companies.

Unfortunately, low profits appear to be a considerable problem for all the tour operators in LSI, as they made less than a few thousand dollars in profit before equipment renewals and write-offs in 2002. On one hand, this small profit margin continues to make it difficult and risky for these companies to invest and improve their ecotourism activities. On the other hand, it also makes the operators in LSI very vulnerable to declines in demand or increasing expenses. These financial constraints are one of the main reasons, why so few of the tourism operators have managed to diversify their activities outside the whale watching season. LSI is first and foremost known as a whale watching destination. Moreover, most of the companies do not yet feel they have the experience or know-how to promote different attractions independently from the whales.

8.1.3 Strategies to Increase Ecotourism Benefits

The LSI case study strongly suggested that both the socio-economic benefits from ecotourism and the viability of the ecotourism operators improved between 1994 and 2002. However, it also showed that further ecotourism growth would be restricted by of the factors with the most important being:

- Unresolved historic land use conflicts over rights to land with ecotourism possibilities
- Lack of activities diversification possibilities outside the tourism season
- Stagnating visitor numbers
- Uneven business skills among operators
- Poor marketing and promotional efforts
- Insufficient ecotourism infrastructure
- A proposed ecotourism tax
- Low profit margin of the ecotourism operators
- Lack of funding for further investments

To alleviate these threats and barriers, while further improving the viability of the ecotourism activities in LSI, 13 general strategies were identified. An elaboration of these resulted in 39 concrete operational strategies for how potentially to implement them (Table 25). These strategies were selected for the following four reasons: (i) They were the ones perceived to have the most potential for growth; (ii) were relatively financially viable; (iii) adhered to VIBERE development goals for sustainable tourism development; and (iv) were reasonably hands on.
However one important exception to the above criteria was the suggestion to pave the access road from San Ignacio to LSI as it would be costly to finance, could lead to severe environmental impacts and likely would be met with resistance from stakeholders interested in protecting the pristine nature and whales from any development of this kind. Another somewhat controversial was the strategy involved engaging the illegal residents from El Cardon as these residents do not officially belong in the lagoon. Solving the issues facing these people is a key to the future stability of LSI as a community.

Generally it is unlikely that LSI will be able to implement many of these strategies on its own, as they will require additional support in the form of financing, training, expert advice and political leverage. It is therefore crucial that the LSI management and NGOs continue to be actively involved in building the capacity for and further the development of ecotourism activities in LSI.
Table 25: Possible Strategies to Improve Ecotourism Activities in Laguna San Ignacio

<table>
<thead>
<tr>
<th>Indicator Group</th>
<th>General Strategy</th>
<th>Sub-Strategies for possible implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategies to improve the economic benefits to the local people and the management of the Reserve in LSI</td>
<td>Divert ecotourism income to VIBERE</td>
<td>Divert the proposed government ecotourism tax to the management of the Reserve (VIBERE).</td>
</tr>
<tr>
<td></td>
<td>Improve local Infrastructure</td>
<td>Improve road from San Ignacio to LSI</td>
</tr>
<tr>
<td></td>
<td>Strengthen local participation</td>
<td>Establish better telecommunication facilities</td>
</tr>
<tr>
<td>Strategies to improve the participation of locals in the decision making of VIBERE</td>
<td>Solve land use conflicts</td>
<td>Make ARIC ideas and plans more transparent to local people</td>
</tr>
<tr>
<td></td>
<td>Involve marginalized groups more in ecotourism</td>
<td>Involve NGOs more in overseeing the proposed UMA</td>
</tr>
<tr>
<td></td>
<td>development</td>
<td></td>
</tr>
<tr>
<td>Strategies to improve the local community cohesion and identity in LSI</td>
<td>Inform and educate locals more</td>
<td>Renegotiate the land sales from 1994 between old time residents and the new owners</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improve the living conditions of El Centro</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Issue more permits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Give residents from El Cardon access to tourism training programs</td>
</tr>
<tr>
<td>Strategies to improve the local support for the Reserve in LSI.</td>
<td>Improve promotion activities</td>
<td>Erect more signs with info about the biosphere and world heritage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Creating special community events and festivals tied to the grey whale and the world heritage site</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Support more educational programs for children about VIBERE</td>
</tr>
<tr>
<td>Strategies to improve the viability of tourism operators in LSI</td>
<td>Increase the diversification of tourism activities</td>
<td>Enhance birding activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Improve kayaking activities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Create eco-tours</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establish sports fishing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make unique adventure tours / photo safaris</td>
</tr>
<tr>
<td></td>
<td>Improve lodging facilities</td>
<td>Use local materials more</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make windows facing the sea</td>
</tr>
<tr>
<td></td>
<td>Examine local ecotourism prices</td>
<td>Improve amenities to increase prices</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Study the price elasticity of whale watching activities in LSI</td>
</tr>
<tr>
<td></td>
<td>Reduce operating costs</td>
<td>Continue to replace 2-stroke outboard engines with more economical and environmentally friendly 4-stroke ones</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Look for funding to enhance future or existing tourism activities.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply for funding through the Mexican government</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Establish ties with environmental foundations / trust funds</td>
</tr>
<tr>
<td></td>
<td>Fund business partners</td>
<td>Hire consultant to find suitable partners / investors</td>
</tr>
<tr>
<td></td>
<td>Improve operators’ business and tourism skills</td>
<td>Provide more training courses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make feedback forms from visitors</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Create guide training manual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Offer internships and study possibilities for university students</td>
</tr>
</tbody>
</table>
8.2 What Were the Strengths and Weaknesses of the Selected Approach/Method?

8.2.1 Relevance and Utility

One of the strengths of the chosen case study methodology was its flexible and exploratory approach. This was highly useful as it was unknown from the onset of the research what would emerge as the most significant ecotourism issues in LSI. This approach was also warranted, considering the lack of solid and reliable historical data, which made it difficult to use predetermined statistical analysis or quantitative tools for measuring or describing certain events. Hence, this approach, coupled with the chosen indicators, became an excellent and very practical tool for evaluating changes in the development of LSI ecotourism activities over time.

A very important aspect of the evaluation framework was the decision to not only use indicators to measure socio-economic changes, but also to measure the viability of the local and tourism regional operators. This combination of indicators led to a more precise and detailed understanding of the underlying, and often complex, inter-related factors that shaped the ecotourism development in LSI between 1994 and 2002. This approach was useful in identifying the strengths and weaknesses of the current ecotourism development in LSI. It also provided strong indications of which ecotourism-related issues should be addressed in the future. The latter insight was important, as the guiding rationale behind this research was to give local stakeholders and the management of the Reserve input on how to strengthen LSI’s ecotourism activities in a sustainable and more economically beneficial fashion.

The selected methodological framework was also straightforward to apply, as most indicators with the exception of the economic ones were relatively easy to collect through previously published literature or through interviews with relevant stakeholders.

However, some design weaknesses were also noted:

- One weakness associated with the framework design was the high number of indicators. While this increased the understanding of the ecotourism development issues in LSI, it proved lengthy to apply this set of indicators in its entirety when interviewing stakeholders.
As a result some respondents were only presented with a subset of the indicators based on their perceived knowledge and background. This undoubtedly caused some bias in the results.

- Some problems of parallel structure were noted in the five criteria chosen for evaluating ecotourism development in LSI. This was caused by the inter-related nature of the criteria, which made it difficult to choose indicators that did not overlap. For instance, changes in visitor numbers were not only a good measurement for economic impacts, but also for the viability of the tourism operators. Some of the indicators used to evaluate economic, social and political changes could likewise also have been used to evaluate local support for the biosphere reserve. However, some of the repetition also occurred in the analysis because some events in LSI were found to be catalyst for multiple changes. For instance, the proposal to expand ESSA’s salt flat facilities was found to have had substantial impacts not only on ecotourism demand, but also on community cohesion and the political changes in the lagoon. This made it difficult to avoid some degree of redundancies in the analysis.

8.2.2 Validity

A study’s validity is threatened if it fails to measure what it sets out to do and if logical errors arise from drawing conclusions from the data. This problem can occur if the construct (i) lack analytical soundness; (ii) use poor or insufficient sources; or (iii) if the study is subject to significant biases in interpreting and collecting the data.

To avoid these problems, this study relied on indicators that had been adequately documented to be of known quality in the ecotourism, biosphere and business literature. In the data collection and analysis, multiple sources and methods were used to look at the same phenomenon. This triangulation helped increase the validity of the investigation, as most indicators showed converging results. Using multiple sources also helped reduce personal and methodological biases. This was particularly important to secure the validity of the quantitative indicators.

However, a few areas were problematic:

- The lack of data, the reluctance of some ecotourism operators to submit financial figures and previous researcher’s rudimentary methods of estimating historic economic impacts made it difficult to measure economic changes precisely. This was particularly true for the data points related to key economic figures, such as profits, spending, visitor numbers and
turnover. The investigation therefore had to base its estimates on very rough assumptions for both 1994 and 2002. While these numbers likely indicated the correct direction of trends, they would need to be further validated, as these had a high degree of uncertainty.

- The conclusions concerning the cause and effect of the social and political changes that occurred in LSI is also likely to be biased by the researchers' interpretation, as these indicators were of qualitative nature.

- Some biases were also involved in the selection of respondents as it was non-random. However this is believed to have been a very small problem as these people represented a wide spectrum of the most important tourism stakeholder in LSI including the tourism operators, community organizations, government officials, social scientists and local fishers.

8.2.3 What does this mean for the conclusions in terms of transferability to other locations?

Few of the indicators were specific to LSI. The framework can therefore with be used to analyze any biosphere reserve independent of its kind of ecotourism development. The simplicity of this methodology combined with its low cost and ability to generate valid data concerning impacts, trends and viability makes it a strong management tool. The low cost is a highly relevant factor, considering the financial restraints facing most biosphere reserves.

However, some limitations in the framework design will make it difficult to do useful comparisons between various biospheres without developing the framework further. One challenge would be to address how to make the used qualitative indicators more comparable among sites. Currently this is difficult because they provide no fixed point of reference that makes statistical ordination possible. This could be solved by ranking some of these indicators according to a worst and best case scenario using an ordinal scale. The issue then becomes how to specify precise criteria that ensures that the measurement of the same phenomena at different times and places yields consistent outcomes.

8.2.4 Future proposed research directions

This study has highlighted the importance of improving the viability of the local and regional tour operators in LSI to sustain the future growth of the ecotourism activities in VIBERE. To do so, the research recommended a number of strategies. However, the feasibility of these recommended
next steps in terms of costs and risks will need to be assessed in more detail. Recommended future research would be to look at:

- What the best options for ecotourism operators to diversify their products and services would be to generate ecotourism income year round;
- How changes in tour prices affect ecotourism demand and whether current prices are set too low;
- How tourism operators can take better advantages of the opportunities the internet provides to attract and service visitors;
- What the best options for tourism operators would be to maximize the limited funding they have for promotional activities;
- How tourism operators can attract good investors, capital and partners to increase investment and expertise to strengthen existing and new ecotourism development;
- How feasible is it for tourism operators to invest in their camps and services to attract more upscale clients; and
- Whether ecotourism certification is worthwhile obtaining considering the work and cost involved?

To address the above issues, it would be helpful to look at best and worst case scenarios from other ecotourism locations. However, future research should also address other alternative options for economic development in LSI, aquaculture, as it is unlikely that ecotourism ever will be able to employ and sustain the entire community of LSI - despite its prospects for further growth.


Bibliography


Ref Type: Generic

Ref Type: Generic

ARIC 2000, Unidad de Conservacion, Manajo y Aprovechamiento Turistico de la Vida Silvestre en Laguna San Ignacio, B.C.S., ARIC.


Ref Type: Electronic Citation


Ref Type: Generic


Ref Type: Electronic Citation

Ref Type: Journal (Full)

Ref Type: Generic


Ref Type: Generic


Dedina, S. 2000a, Saving the Grey Whale - People, Politics and conservation in Baja California The University of Arizona Press, Tuscon.


Dedina, S. Ecotourism and Community Development Issues in Laguna San Ignacio. Interview with Serge Dedina, Director of Wildcoast. 2002.
Ref Type: Generic

Ref Type: Newspaper


Dedina, S. & Young, E. 1995, Conservation and Development in the Gray Whale Lagoons of Baja California Sur, Mexico, Department of Geography and Regional Development, University of Arizona, Tuscon, Arizona.

Dedina, S. 2000b, Saving the gray whale people, politics, and conservation in Baja California University of Arizona Press, Tucson.


Eagles, F. J. & Bowman, M. E. 1999, Guidelines for Tourism in Parks and Protected Areas in East Asia, IUCN.


Esliman, A. Ecotourism Issues in Laguna San Ignacio. Interview with Aaron Esliman, Sub-
Director of El Vizcaino Biosphere Reserve. 2002.
Ref Type: Generic


Ref Type: Generic

Fischer, R. Ecotourism Issues in Laguna San Ignacio. Interview with Romualdo Fischer Liera, Director of Baja Adventure. 2002b.
Ref Type: Generic

Friday, J. Ecotourism Issues in Laguna San Ignacio. Interview with Johnny Friday, Director of Baja Adventure. 2002.
Ref Type: Generic

Ref Type: Electronic Citation

Ref Type: Generic

Gardea-Ojeda, M. Ecotourism Issues in Laguna San Ignacio. Interview with Manuel Gardea-Ojeda, Universidad Autónoma de Baja California (UABC), Ensenada. 2002.
Ref Type: Generic

Heckel, G. Issues related to whale watching in LSI. Interview with Gisela Heckel, Researcher, Centro de Investigación Científica y de Educación Superior de Ensenada (CICESE), Ensenada. 2002.
Ref Type: Generic


Ref Type: Generic

Jackson, I. 1984, "Carrying Capacity for Tourism in Small Tropical Caribbean Islands", *UNEP industry and environment*.


Ref Type: Electronic Citation


Ref Type: Generic

Ref Type: Journal (Full)

Ref Type: Electronic Citation


Marcer, T. Ecotourism Issues in Laguna San Ignacio. Interview with Terry Marcer, San Ignacio Springs, San Ignacio. Ref Type: Generic

Martinez, L. Ecotourism Issues in Laguna San Ignacio. Interview with Laura Martinez, Directora Pro Esteros, Ensenada. Laura Martinez, Directora. 2002. Ref Type: Generic

Mason, P. 2003, Tourism impacts, planning and management Butterworth Heinemann, Amsterdam.


Ref Type: Generic


TIES 2005, "TIES Members Honored and in the News", *TIES Digital Traveller*, vol. 3, no. 3.

Toerpfer, K. 2001, "The opportunities of ecotourism", *UNEP industry and environment*, vol. 24, no. 3-4, p. 3.

Ref Type: Electronic Citation

Ref Type: Electronic Citation

Ref Type: Electronic Citation


Ref Type: Electronic Citation


Ward, N. K. 1997a, Reality or Rhetoric: Ecotourism Development in the state of Quintana Roo, México University of Portsmouth.

Ward, N. K. 1997b, Reality or Rhetoric: Ecotourism Development in the state of Quintana Roo, México University of Portsmouth.


WTO 2003, Tourism market trends, Americas.


Young, E. 1995a, *Elusive Edens: Linking Local Needs to Nature Protection in the Coastal Lagoon of Baja California Sur, Mexico*, University of Texas.

Young, E. Ecotourism and Community Development Issues in Laguna San Ignacio. Interview with Emily Young, Researcher at Arizona State University. 2002.

Ref Type: Generic

Young, E. 1995b, *Elusive Edens: Linking Local Needs to Nature Protection in the Coastal Lagoon of Baja California Sur, Mexico*, University of Texas.

Appendices

Described in this appendix are the assumptions, calculations and results used to estimate the tour operators’ gross revenue from whale watching activities in LSI for 1994 and 2002.

This is first done for the local and regional operators according to the four whale watching product segment found in LSI: day trips; package tours, guide and boat services to foreign camps and to liveaboards that visited LSI. Then the section estimate the gross revenue made by the foreign camps and liveaboards. Finally calculations are used to estimate the gross revenue for the local and regional tour operators that sold package tours and the ones that did not for 2002. Tables are included in the end that compare and summarize the most important results from these estimations.

Gross Revenue Generated from Day Tours
All five local and regional operators were involved in this product segment between 1994 and 2002. The number of day tour visitors was approximately 605 people in 1994. This number was found by subtracting the total visitor numbers given by the management of the Reserve from the numbers reported by Young for the outside based operators (as her visitor numbers included all but the number of day visitors). In 2002, the number of day tour visitors increased to 2280. This number was estimated based on the visitor number submitted by the tourism operators and the management of the Reserve.

All local and regional companies charged $35 per person for adult foreigners between 1994 and 2002. Mexican nationals and children received then a 15% discount. According to local tour operators approximately 70% of the visitors were adult foreigners in 2002. Most visitors conducted one trip. However, about 5% of the visitors conducted two trips. These visitor patterns were assumed to describe 1994 as well.

Consequently the typical price per whale watching trip was estimated to be approximately $33 per trip \( [(35 \text{ per trip} \times 0.70 \text{ foreign visitors}) + (35 \text{ per trip} \times 0.3 \text{ Mexican or child visitor} \times 0.85 \text{ discount})] \).

The estimated worst case scenario was estimated to represent if all visitors were Mexican or children and only conducted one trip each. The best case scenario was estimated as if all the day tour visitors were adult foreigners and conducted two trips each.

Table 26: Gross Revenue Estimates of Local and Regional Tour Operators from Day Tours for 1994 and 2002

<table>
<thead>
<tr>
<th>Year</th>
<th>Scenario</th>
<th>Visitors (1000)</th>
<th>Price per Trip (USD)</th>
<th>Price per Trip Adjusted (USD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>Typical Scenario</td>
<td>605</td>
<td>$33</td>
<td>$21,000</td>
</tr>
<tr>
<td></td>
<td>Best Case Scenario</td>
<td>605</td>
<td>$35</td>
<td>$42,000</td>
</tr>
<tr>
<td></td>
<td>Worst Case Scenario</td>
<td>605</td>
<td>$30</td>
<td>$18,000</td>
</tr>
<tr>
<td>2002</td>
<td>Typical Scenario</td>
<td>2280</td>
<td>$33</td>
<td>$80,000</td>
</tr>
<tr>
<td></td>
<td>Best Case Scenario</td>
<td>2280</td>
<td>$35</td>
<td>$160,000</td>
</tr>
<tr>
<td></td>
<td>Worst Case Scenario</td>
<td>2280</td>
<td>$30</td>
<td>$68,000</td>
</tr>
</tbody>
</table>
Gross Revenue Generated from Servicing Foreign Camps

One local and one regional operator were involved in servicing two foreign camps with boats and skiff drivers between 1994 and 2002. Young reported that 360 visitors stayed with one of the two upscale foreign camps in 1994. ARIC reported in 2002 that this number had increased to approximately 400 in 2002. These visitors typically conducted 4-6 trips each during their stay in LSI. Five trips were used as the typical number of trips for both 1994 and 2002.

It was not possible to obtain a good estimate for what tourism operators were paid from renting out their boats and guides services. However, one of the foreign camps reported that it paid the skiff drivers $50 per whale watching trip in 2002. This amount represented according to a number of skiff drivers exactly 30% of what foreign companies paid totally in outsourcing expenses for renting a skiff including guides and other expenses like gas. $165 was therefore assumed to be what local and tourism operators were paid per skiff [If 30% = $50 then 100% = $165].

In 2002, each skiff was typically filled with 6-10 people. The income per passenger from these trips was therefore likely to be between $17 and $28 ($165/6 passengers or $165/10 passengers). The average, $23, was assumed to be the typical revenue per passenger from outsourcing activities.

Table 27: Gross Revenue Estimates of Local and Regional Tour Operators from Foreign Camps for 1994 and 2002

<table>
<thead>
<tr>
<th>Year</th>
<th>Typical Scenario</th>
<th>Best Case Scenario</th>
<th>Worst Case Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>360 visitors x $23 per trip x 5 trips ≈ $41,000</td>
<td>360 visitors x $28 per trip x 6 trips ≈ $60,000</td>
<td>360 visitors x $17 per trip x 4 trips ≈ $24,000</td>
</tr>
<tr>
<td>2002</td>
<td>400 visitors x $23 per trip x 5 trips ≈ $46,000</td>
<td>400 visitors x $28 per trip x 6 trips ≈ $67,000</td>
<td>400 visitors x $17 per trip x 4 trips ≈ $27,000</td>
</tr>
</tbody>
</table>

Gross Revenue Generated from Servicing Liveaboards

Only one operator was involved in renting its skiffs and guides to liveaboards between 1994 and 2002. According to the data provided by Young and ARIC this segment declined in passenger numbers from approximately 1060 to 250 visitors during those years. Most visitors onboard...
these boats typically did one or two trips as they only stayed one night in the lagoon. 1.5 trips were used as the average number of trips per visitor in lack of more precise data.

Estimating the local and regional gross revenue per passenger from this product segment was done using the same calculations and assumptions described in the previous section on servicing foreign camps. These estimates indicated that local and regional tour operators earned between $17 and $28 per passenger with $23 being the typical average.

Table 28: Gross Revenue Estimates of Local and Regional Tour Operators from Liveaboards for 1994 and 2002

<table>
<thead>
<tr>
<th></th>
<th>1994</th>
<th>2002</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Typical Scenario</td>
<td>Typical Scenario</td>
</tr>
<tr>
<td></td>
<td>1060 visitors x $23 per trip x 1.5 trips ≈ $37,000</td>
<td>250 visitors x $23 per trip x 1.5 trips ≈ $9,000</td>
</tr>
<tr>
<td></td>
<td>Best Case Scenario</td>
<td>Best Case Scenario</td>
</tr>
<tr>
<td></td>
<td>1060 visitors x $28 per trip x 2 trips ≈ $59,000</td>
<td>250 visitors x $28 per trip x 2 trips ≈ $14,000</td>
</tr>
<tr>
<td></td>
<td>Worst Case Scenario</td>
<td>Worst Case Scenario</td>
</tr>
<tr>
<td></td>
<td>1060 visitors x $17 per trip x 1 trips ≈ $18,000</td>
<td>250 visitors x $17 per trip x 1 trips ≈ $4,000</td>
</tr>
</tbody>
</table>

**Gross Revenue Generated from Package Tours**

From 1994 to 2002 the number of local and regional operators that sold package tours increased from one to two companies. Their tours varied significantly in terms of price and duration:

*Company A:* 
Young estimated that 175 visitors stayed 2.5 days and paid a total of $140,000 on low priced camps with outside based operators in 1994. Then only one operator was involved in selling these tours. This regional based operator charged $135 per day for its package tours (including accommodation, food and whale watching activities) in 2002. Visitors would typically spend from 1-3 days in the camp that year. Young’s estimate of revenue ($320 per visitor per day) was therefore discarded as being vastly overestimated as the company stated it had not lowered its products prices since 1994. $135 and a length of stay of two days were therefore assumed to be the typical numbers for both years. A reported approximate of 300 people purchased a package tour with this company in 2002.

*Company B:* This company stated that approximately 70 people purchased one of its package tours in 2002. These ranged in price from $185 to $225 per day. The visitors would stay 1-4
days, but three days were the typical stay according to the owner. $200 was chosen as the average price in lack of more precise info.

Using these numbers it was possible to estimate the typical, best and worst case scenario for the local and regional gross revenue from package tours:

**Table 29: Gross Revenue Estimates of Local and Regional Tour Operators from Package Tours for 1994 and 2002**

<table>
<thead>
<tr>
<th>Year</th>
<th>Typical Scenario</th>
<th>Best Scenario</th>
<th>Worst case scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>175 visitors x $135 per trip x 2 trips = $47,000</td>
<td>175 visitors x $135 per trip x 3 trips = $71,000</td>
<td>175 visitors x $135 per trip x 1 trips = $24,000</td>
</tr>
<tr>
<td>2002</td>
<td>(300 visitors x $135 per days x 2 days) + (70 visitors x $200 per day x 3 days) ≈ $123,000</td>
<td>(300 visitors x $135 per days x 3 days) + (70 visitors x $225 per day x 4 days) ≈ $185,000</td>
<td>(300 visitors x $135 per days x 1 days) + (70 visitors x $185 per day x 1 days) ≈ $53,000</td>
</tr>
</tbody>
</table>

**GROSS REVENUE GENERATED BY FOREIGN CAMPS FOR 1994 AND 2002**
Young reported that a total of 360 people paid an average of $1,300 per trip for an all inclusive trip including airfare with one of the two foreign camps operating in LSI in 1994. By 2002, the visitor numbers had increased to 400. The average cost that year was assumed to be $1,650 as prices then ranged from $1,500 to $1,800.

**Table 30: Gross Revenue Estimates of Foreign Tour Camps for 1994 and 2002 in LSI**

<table>
<thead>
<tr>
<th>Year</th>
<th>Typical Scenario</th>
<th>Best Scenario</th>
<th>Worst case scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>360 visitors x $1,300 per tour = $468,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>400 visitors x $1,650 per tour = $660,000</td>
<td>400 visitors x $1,800 per tour = $720,000</td>
<td>400 visitors x $1,500 per tour = $600,000</td>
</tr>
</tbody>
</table>
GROSS REVENUE GENERATED BY FOREIGN LIVEABOARDS FOR 1994 AND 2002

Young reported that 560 visitors paid an average of $3,500 to visit LSI onboard two cruise ships in 1994. During the same period LSI was also visited by five tour boats. The number of these visitors totaled approximately 500 people who paid $1,500 each. Except for the price it was not clear how Young defined the difference between these boats. Any kind of boats visiting LSI with the purpose of whale watching was therefore classified as a liveaboard. According to ARIC only 250 people onboard liveaboards went whale watching in 2002. These boats included the "Searcher", "Royal Star", "Pacific Queen", "Shogun", "Spirit of Adventure", "Horizon", "Sea Bird" and "Sea Lion". An analysis of these boats tour prices showed that were priced from $3,125 to $5,500 for trips lasting from 8 to 16 day trips. Most of these boats would only stay one night in LSI as the primary objective for most of these boats was fishing. $3,500 was set as the mean price for these tours in lack of better data.

Table 31: Gross Revenue Estimates of Liveaboards for 1994 and 2002

<table>
<thead>
<tr>
<th>Year</th>
<th>Scenario</th>
<th>Number of Visitors</th>
<th>Tour Price</th>
<th>Total Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994</td>
<td>Typical Scenario</td>
<td>560</td>
<td>$3,500</td>
<td>$2,710,000</td>
</tr>
<tr>
<td></td>
<td>(560 visitors x $3,500 per tour)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>Typical Scenario</td>
<td>250</td>
<td>$23</td>
<td>$9,000</td>
</tr>
<tr>
<td></td>
<td>Best Case Scenario</td>
<td>250</td>
<td>$28</td>
<td>$14,000</td>
</tr>
<tr>
<td></td>
<td>Worst Case Scenario</td>
<td>250</td>
<td>$17</td>
<td>$4,000</td>
</tr>
</tbody>
</table>


An estimated total of 1920 visitor numbers went whale watching with one of the two companies that sold package tours in 2002. Breaking down these numbers according to the four whale watching segments showed: 1,040 were day tourists, 260 came from foreign camps, 250 were boat passengers and 370 had purchased a package tours. A further breakdown of the package tour showed that 70 went with one operator and 300 went with another. Using the previous established assumptions for prices, trips duration and local income from outsourcing the following estimates were calculated:
Table 32: Gross Revenue Estimates from Foreign Tour Camps made by Local and Regional Companies that Sold Package Tours in 2002

<table>
<thead>
<tr>
<th>Day Tours</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Scenario</td>
<td>1,040 visitors x $33 per trip x 1.05 trips = $37,000</td>
</tr>
<tr>
<td>Best Case Scenario</td>
<td>1,040 visitors x $35 per trip x 2 trips = $73,000</td>
</tr>
<tr>
<td>Worst Case Scenario</td>
<td>1,040 visitors x $30 per trip x 1 trips = $31,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outsourcing Income from Foreign Camps</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Scenario</td>
<td>260 visitors x $23 per trip x 5 trips = $30,000</td>
</tr>
<tr>
<td>Best Case Scenario</td>
<td>260 visitors x $28 per trip x 6 trips = $44,000</td>
</tr>
<tr>
<td>Worst Case Scenario</td>
<td>260 visitors x $17 per trip x 4 trips = $18,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outsourcing Income from Tour Boats</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Scenario</td>
<td>250 visitors x $23 per trip x 1.5 trips = $9,000</td>
</tr>
<tr>
<td>Best Case Scenario</td>
<td>250 visitors x $28 per trip x 2 trips = $14,000</td>
</tr>
<tr>
<td>Worst Case Scenario</td>
<td>250 visitors x $17 per trip x 1 trips = $4,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Package Tours</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Scenario</td>
<td>(300 visitors x $135 per day x 2 days) + (70 visitors x $200 per day x 3 days) = $123,000</td>
</tr>
<tr>
<td>Best case scenario</td>
<td>(300 visitors x $135 per day x 3 days) + (70 visitors x $225 per day x 4 days) = $185,000</td>
</tr>
<tr>
<td>Worst case scenario</td>
<td>(300 visitors x $135 per day x 1 days) + (70 visitors x $185 per day x 1 days) = $53,000</td>
</tr>
</tbody>
</table>

GROSS REVENUE OF THE LOCAL AND REGIONAL COMPANIES THAT DID NOT SELL PACKAGE TOURS IN 2002.

Three and regional companies belonged to this category. In 2002, they all sold day tours. One also had income from servicing one of the foreign local camps. According to Young and ARIC 1240 day visitors and 140 tourists from the foreign camps were serviced by these operators in 2002. These numbers generated the following estimates of gross revenue using the previous established assumptions for prices, number of trips and outsourcing income:

Table 33: Gross Revenue Estimates from the Foreign Tour Camps made by Local and Regional Companies that did not sell Package Tours in 2002

<table>
<thead>
<tr>
<th>Day Tours</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Scenario</td>
<td>1,240 visitors x $33 per trip x 1.05 trips = $44,000</td>
</tr>
<tr>
<td>Best Case Scenario</td>
<td>1,240 visitors x $35 per trip x 2 trips = $87,000</td>
</tr>
<tr>
<td>Worst Case Scenario</td>
<td>1,240 visitors x $30 per trip x 1 trips = $37,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Outsourcing Income from Foreign Camps</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Scenario</td>
<td>140 visitors x $23 per trip x 5 trips = $16,000</td>
</tr>
<tr>
<td>Best Case Scenario</td>
<td>140 visitors x $28 per trip x 6 trips = $10,000</td>
</tr>
<tr>
<td>Worst Case Scenario</td>
<td>140 visitors x $17 per trip x 4 trips = $24,000</td>
</tr>
</tbody>
</table>
### Assumptions and Price Ranges Used to Estimate Gross Revenue Generated by All Tourism Operators Involved in Whale Watching in LSI in 1994 and 2002:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Visitors</th>
<th>Range</th>
<th>Price</th>
<th>Duration</th>
<th>Estimated Gross Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL/REGIONAL OPER.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day tours</td>
<td>605</td>
<td>$30-35 per trip</td>
<td>$33</td>
<td>1-2 trips</td>
<td>$18-42</td>
</tr>
<tr>
<td>Outsourcing Foreign Camps</td>
<td>360</td>
<td>$17-28 per trip</td>
<td>$23</td>
<td>4-6 trips</td>
<td>$24-60</td>
</tr>
<tr>
<td>Outsourcing Liveaboards</td>
<td>1060</td>
<td>$17-28 per trip</td>
<td>$23</td>
<td>1-2 trips</td>
<td>$18-59</td>
</tr>
<tr>
<td>Package Tours</td>
<td>175</td>
<td>n/a</td>
<td>$135</td>
<td>1-3 days</td>
<td>$24-71</td>
</tr>
<tr>
<td>TOTAL LOC/REG OPER</td>
<td>2,200</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| FOREIGN CAMPS/LIVEaboARDS    |          |       |            |          |                          |
| Foreign Camps                | 360      | n/a   | $1,300     | n/a      | n/a | $468 |
| Liveaboards                  |          |       |            |          |                          |
| - Cruise Ships               | 560      | n/a   | $3,500     | n/a      | n/a | $2,710 |
| - Tour Boats                 | 500      | n/a   | $1,500     | n/a      | n/a | $9 |
| TOTAL FOR. OPER.             | 1,420    |       |            |          |             |     |
| TOTAL ALL OPERATORS          | 2,200    |       |            |          |             |     |

### Tourism Season 2002:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Visitors</th>
<th>Range</th>
<th>Price</th>
<th>Duration</th>
<th>Estimated Gross Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCAL/REGIONAL OPER.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day tours</td>
<td>2,280</td>
<td>$30-35 per trip</td>
<td>$33</td>
<td>1-2 trips</td>
<td>$68-160</td>
</tr>
<tr>
<td>Outsourcing Foreign Camps</td>
<td>400</td>
<td>$17-28 per trip</td>
<td>$23</td>
<td>4-6 trips</td>
<td>$27-67</td>
</tr>
<tr>
<td>Outsourcing Liveaboards</td>
<td>250</td>
<td>$17-28 per trip</td>
<td>$23</td>
<td>1-2 trips</td>
<td>$4-14</td>
</tr>
<tr>
<td>Package Tours:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Company A</td>
<td>300</td>
<td>$135 per day</td>
<td>$135</td>
<td>1-3 days</td>
<td>$53-185</td>
</tr>
<tr>
<td>- Company B</td>
<td>70</td>
<td>$185-225 per day</td>
<td>$200</td>
<td>1-4 days</td>
<td>$53-185</td>
</tr>
<tr>
<td>TOTAL</td>
<td>3,300</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| FOREIGN CAMPS/LIVEaboARDS    |          |       |            |          |                          |
| Foreign Camps                | 400      | $1,500-1,700 per tour | $1,650 | n/a | $600-720 | $660 |
| Liveaboards                  | 250      | $3,125-5,500 per tour | $5,500 | n/a | $781-1,375 | $875 |
| TOTAL                        | 650      |       |            |          |             |     |
| TOTAL ALL OPERATORS          | 3,300    |       |            |          |             |     |
### Assumptions and Price Ranges Used to Estimate Gross Revenue Generated by Local and Regional Tour Operators Defined by Whether They Sold Package Tours or Not in 2002:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Visitors</th>
<th>Price</th>
<th>Duration</th>
<th>Estimated Gross Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Companies that sold package tours:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day tours</td>
<td>1,040</td>
<td>$30-35 per trip</td>
<td>1-2 trips</td>
<td>$33-73 (thousands)</td>
</tr>
<tr>
<td>Outsourcing Foreign Camps</td>
<td>260</td>
<td>$17-28 per trip</td>
<td>4-6 trips</td>
<td>$18-44 (thousands)</td>
</tr>
<tr>
<td>Outsourcing Liveaboards</td>
<td>250</td>
<td>$17-28 per trip</td>
<td>1-2 trips</td>
<td>$4-14 (thousands)</td>
</tr>
<tr>
<td>Package Tours:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Company A</td>
<td>300</td>
<td>$135 per day</td>
<td>1-3 days</td>
<td>$53-184 (Comp. A+B)</td>
</tr>
<tr>
<td>- Company B</td>
<td>70</td>
<td>$185-225 per day</td>
<td>1-4 days</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1,920</td>
<td></td>
<td></td>
<td>$106-316 (thousands)</td>
</tr>
<tr>
<td><strong>Companies that did not sell package tours:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day tours</td>
<td>1,240</td>
<td>$30-35 per trip</td>
<td>1-2 trips</td>
<td>$37-87 (thousands)</td>
</tr>
<tr>
<td>Outsourcing Foreign Camps</td>
<td>140</td>
<td>$17-28 per trip</td>
<td>4-6 trips</td>
<td>$10-24 (thousands)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1,380</td>
<td></td>
<td></td>
<td>$47-111 (thousands)</td>
</tr>
<tr>
<td><strong>TOTAL ALL LOC/REG. Companies</strong></td>
<td>2,200</td>
<td></td>
<td></td>
<td>$153-527 (thousands)</td>
</tr>
</tbody>
</table>
Feasibility Study of Changing From 2-stroke to 4-stroke Outboard Engines in the Lagoon of San Ignacio, Mexico

By Peter Rossing
2002

The World Heritage Site of Laguna San Ignacio, located in the Biosphere Reserve of El Viscaino in Baja Mexico Sur. represents one of the three most important breeding lagoons for the eastern Pacific population of the Gray Whale (Eschrichtius robustus). This Pacific lagoon, surrounded by desert, also provides habitat for 141 species of birds, many fish and marine invertebrates, dolphins, sea lions, and sea turtles. It is also home to five small fishing communities totaling 500 people that depend solely on the lagoon and the sea to make a living in the form of small-scale fishing and ecotourism.

Suffering from rising cost of fishing and the recent drop in tourism due to the 9/11 terrorism attack, these communities have been hard hit. Finding ways to raise income while maintaining the integrity of the San Ignacio Lagoon ecosystems is therefore a real concern. This paper explores the feasibility of exchanging the outboard motors used for whale watching and fishing in the Lagoon of San Ignacio from the mostly 2-stroke to 4-stroke engines as a means to cut costs, raise the disposable income of the community, and cut pollution in one of the most unique and important lagoons in the world.

There are many obvious benefits from exchanging 2-stroke with 4-stroke engines:

- The 4-stroke engines use 30-70% less fuel.
- The 4-stroke engines are quieter.
- The 4-stroke engines do not need fuel mixed with oil, which both cuts the cost of buying oil and eliminates trash from discarded plastic oil bottles.
- The 4-stroke engines have fewer mechanical problems.
- The 4-stroke engines last longer.
- The 4-stroke engines pollute significantly less because both water and air emissions contaminated by fuel are far less with 4-stroke engines.

However, 4-stroke outboard engines are more expensive to buy. For fishermen and tour operators who are struggling due to increasing operating cost and for environmentalists who are becoming increasingly concerned about pollution, it is therefore a relevant question to ask under what circumstances and when the direct economic benefits from a new 4-stroke engine exceeds the use of either a new or existing 2-stroke. In other words, how many days does it take before the fuel and oil savings balance the extra cost of a new 4-stroke engine, making it cheaper to use than a new or existing 2-stroke?
In order to examine this question, four different scenarios were explored:
1. New 4-stroke or new 2-stroke used for whale watching only.
2. New 4-stroke with existing 2-stroke used for whale watching only.
3. New 4-stroke or new 2-stroke if used both for whale watching and fishing.
4. New 4-stroke with existing 2-stroke used both for whale watching and fishing.

Fishermen and whale-watchers with both types of engines from Laguna San Ignacio were consulted to establish the days of use and fuel and oil consumption. From discussions with different people, it was determined that an engine of approximately 80 hp was needed to fulfill the need of both fishing and tourism use.

In these calculations, a 4-stroke Yamaha 80hp is compared with a 2-stroke with 85hp (Yamaha does not make a 2-stroke with 80hp).

The calculations are based on the following important assumptions:

<table>
<thead>
<tr>
<th>Gasoline</th>
<th>7 pesos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>25 pesos</td>
</tr>
<tr>
<td>Exchange Rate pesos to dollars</td>
<td>10.1</td>
</tr>
<tr>
<td>Number of fishing trips pr. year</td>
<td></td>
</tr>
<tr>
<td>(20 days each month x 8 months)</td>
<td>160 days pr year</td>
</tr>
<tr>
<td>Number of whale watching trips pr. year</td>
<td></td>
</tr>
<tr>
<td>(20 days each month x 4 months)</td>
<td>70 days pr year</td>
</tr>
</tbody>
</table>

The number of days of use seems reasonable since it not possible due to bad weather to conduct whale watching or fish everyday and both activities are seasonal.

<table>
<thead>
<tr>
<th>Yamaha 2-Stroke 85hp AEDL</th>
<th>Yamaha 4-Stroke 80hp AETL</th>
</tr>
</thead>
<tbody>
<tr>
<td>New price in dollars</td>
<td>8288.5</td>
</tr>
<tr>
<td>New price in dollars with 30% rebate</td>
<td>5802.02</td>
</tr>
<tr>
<td>Use of gas pr. whale trip in liters</td>
<td>30</td>
</tr>
<tr>
<td>Use of gas pr. fishing trip in liters</td>
<td>80</td>
</tr>
<tr>
<td>Use of oil pr liter gasoline (1.5 liter for 50 liter gas)</td>
<td>0.03 pr liter gas</td>
</tr>
<tr>
<td>Price pr. whale watching trip</td>
<td>232.5 (US $ 22.91)</td>
</tr>
<tr>
<td>Price pr. fishing trip</td>
<td>620 (US $ 61.08)</td>
</tr>
</tbody>
</table>

The use of gas, as before mentioned, was estimated based on the consultations of various tour operators. In terms of gasoline saved while fishing, the factory estimate by Yamaha of 30% was chosen. This represented a much more conservative choice rather than the 50-50% experienced by the fishers and tour operators. In the calculations the retail price of the new Yamaha motors has been discounted with 30%. According to fishers and tourism operators such rebates were quite common to get if the engines were paid up front and/or in quantities more than one.
Ex.1: New 2-stroke or 4-stroke Tourism Use Only?
Should I buy a new 4-stroke or 2-stroke if I only use it for tourism 70 days per year?

IF

\[
\text{f(2-stroke New)} \text{ Cost per year} = 5802.02 + (22.91 \times 70 \text{ days})
\]
\[
\text{f(4-stroke New)} \text{ Cost per year} = 8281.35 + (8.28 \times 70 \text{ days})
\]

THEN

\[
\text{f(4-stroke New)} \text{ becomes cheaper to operate when}
5802.02 + 1603.7x > 8281.35 + 579.6x
\]

New Yamaha 4-stroke (80hp) vs New 2-stroke (85hp) - Tourism Use Only

It is more economical to use 4-stroke after 2.4 years.
Conclusion: Buying a new 4-stroke Engine saves US $2,641 over 5 years.
Ex. 2: New 4-stroke or Existing 2-stroke Tourism Use Only?
I am a tourism operator who has a 2-stroke already and who does not fish. Should I scrap my 2-stroke and buy a 4-stroke?

**IF**

\[
\begin{align*}
    f(\text{2-stroke Existing})_{\text{cost per year}} &= 22.91 \times 70 \text{ days} \\
    f(\text{4-stroke New})_{\text{cost per year}} &= 8281.35 + (8.28 \times 70 \text{ days})
\end{align*}
\]

**THEN**

\[
    f(\text{4-stroke New}) \text{ becomes cheaper to operate when } 1603.7x > 8281.35 + 579.6x
\]

**With 70 days of annual use it takes 8.1 years before the investment pays off. Savings (losses) in 5 years: US $ -3161**

**Conclusion:** Keep old 2-stroke until time to replace.
Ex.3: New 4-stroke or New 2-stroke (Tourism and Fishing)?
Should I buy a new 4-stroke or a 2-stroke engine for both whale watching and fishing?

If
\[
\begin{align*}
    \text{f(2-stroke New) cost per year} &= $5802.02 + (22.91 \times 70 \text{ days}) + (61.08 \times 160 \text{ days}) \\
    \text{f(4-stroke New) cost per year} &= $8281.35 + (8.28 \times 70 \text{ days}) + (38.68 \times 160 \text{ days})
\end{align*}
\]

Then
\[
\text{f(4-stroke New) becomes cheaper to operate when} \quad 5802.02 + 11377x > 8281.35 + 6759x
\]

It only takes 4-5 months before the savings in fuel pays off the more expensive 4-stroke. Savings in 5 years are astronomical: $20,500 dollars in saved fuel and oil costs.

Conclusion: If you are fishing and have a tourism operation, too, you would save $20,000 over 5 years by buying a 4-stroke engine.
Ex.4: New 4-stroke or existing 2-stroke (Tourism and Fishing)?
I am a tourism operator who has a 2-stroke already for tourism and fishing. Should I scrap my 2-stroke and buy a 4-stroke?

If
\[ f(\text{2-Existing})_{\text{cost per year}} = (22.91 \times 70 \text{ days}) + (61.08 \times 170 \text{ days}) \]
\[ f(\text{4-stroke New})_{\text{cost per year}} = 8281.35 + (8.28 \times 70 \text{ days}) + (38.68 \times 170 \text{ days}) \]

Then
\[ f(\text{4-stroke New}) \text{ becomes cheaper to operate when} \]
\[ 11377x > 8281.35 + 6759x \]

Even with an existing engine, it only takes approximately 1.5 year before the benefits from 4-stroke engines outweigh an existing 2-stroke. In 5 years the total savings is almost $15,000 dollars.

New Yamaha 80hp 4-stroke or Existing 80hp 2-stroke (Tourism and Fishing)

Conclusion: Buying a new 4-stroke engine and scrapping the existing 2-stroke engine will save more than $20,000 over 5 years.
Conclusion:

The above analysis showed major economic gains from shifting to the use of 4-stroke engines except for the person that only conducts tourism and already has a 2-stroke engine. To save between $15,000 to $20,000 US in fuel and oil expenses over 5 years for people conducting both tourism and fishing is not unrealistic at all.

The input numbers have been chosen very conservatively. First, fuel savings for fishing are likely to exceed 30% used in the calculations. Most of the fishermen in the community are reporting fuel savings of more than 50%.

Shifting to the use of 4-stroke engines will also save other costs that were not taken into consideration in the calculations. Fewer trips to the inland town of San Ignacio will be required to purchase fuel. Substantial savings can also be expected for repairing and replacing the engines.

This is a true example of a win-win situation that will benefit both people and the pristine environment of Laguna San Ignacio. However, the change towards the use of 4-stroke engines will be very slow unless some kind of up-front, low-cost loans can be arranged. Few people who operate tourism or fishing activities have the capital up front to pay the dollars it will cost to replace their engines (as much as $8,000 or higher for a new 4-stroke engine of sufficient horsepower). Interest-free or low interest loans could be secured to make the effort to replace 4-stroke outboards take off. Without a doubt, this project represents a great opportunity for the right donor to make a substantial environmental and economic impact.