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The correct citation for this book chapter is as follows:

Carvajal, M.A., E. Ezcurra, and A. Robles. 2004. The Gulf of California: Natural resource concerns and the pursuit of a vision. In: L.K. Glover and S. Earle (eds.) *Defying Ocean's End. An agenda for action*. Island Press, Washington, D.C. pp. 105–124.

CHAPTER 5

The Gulf of California: Natural Resource Concerns and the Pursuit of a Vision

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Introduction: A Unique Marine Ecosystem

The Gulf of California in northwest Mexico (also known as the Sea of Cortés) covers an area of 375,000 square kilometers. It has been called a "caricature of oceanography" because its oceanographic features seem dramatically exaggerated, with deep basins in its central and lower portions and some of the greatest tides in the world in its upper reaches. It contains over a hundred islands and offshore rocks, and strong upwellings of cold nutrient-rich waters are evident along both its coasts. The great diversity of topographic and bathymetric features has produced a great variety of habitats for marine life. The Gulf's high biodiversity levels, biological productivity, 770 endemic (unique to this area) species (Findley forthcoming) and its 39 marine species listed on the IUCN Red List (IUCN 2003) as threatened or vulnerable make this one of the large coastal ecosystem conservation priorities on the planet.

The natural history of the Gulf of California and the Baja California peninsula is one of evolution in isolation. All through the region, the driving theme is insularity. During the last six million years, the Sea of Cortés has kept the long and dry peninsula separated from the Mexican mainland, and the peninsula of Baja California has kept the Sea of Cortés sequestered from the Pacific Ocean. Within this landscape of sea and land that mutually enclose each other, preserving the genetic uniqueness of their life forms, some patches of insularity are superimposed at even smaller scales. Marine islands surround the peninsula on all sides, and rich seamounts, true underwater islands, act as a major factor in endemism (species unique to a small area) and speciation (evolutions of new species). On land, palm oases in deep, disjunctive canyons form thousands of small, isolated wetlands within the rocky matrix of the peninsular ranges. The seacoast is fringed by coastal lagoons that repeat the isolation theme in smaller and smaller bodies of water (Bourillón *et al* 1988, Case, Cody & Ezcurra 2002). These patches of spatial segregation are the driving force of biological speciation, adaptation to local conditions and specialization in particular isolated environments.

In the Sea of Cortés, fragmentation has not only yielded unique life forms resulting in the myriad endemic species, but has also created unique human cultures. Separated from the rest of Mesoamerica, the Cochimí Indians developed one of the most incredible assemblages of cave paintings in the world. Later, under Spanish rule, the Jesuit fathers founded a system of missions here that evolved in complete indepen-

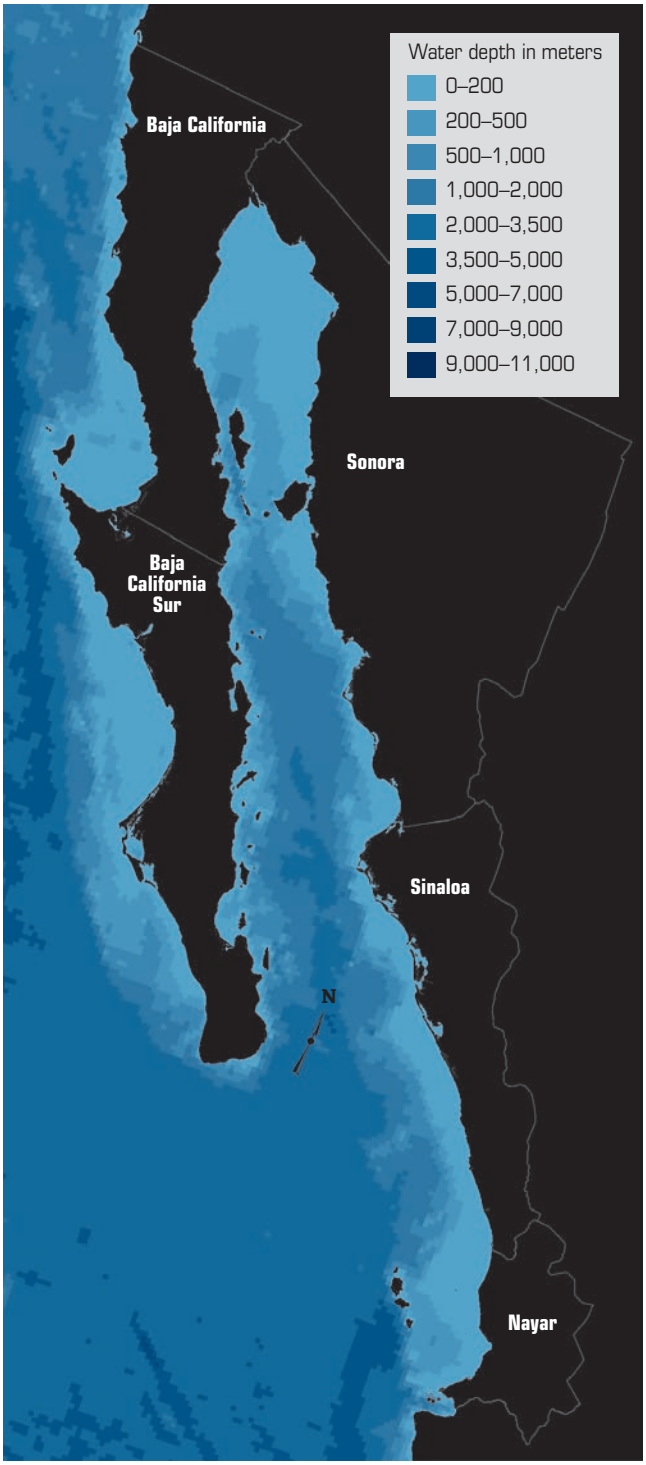

Figure 1 The deep, narrow Gulf of California is a unique marine environment. The bathymetry (water depth) scale is the same as all other maps in this volume.

dence from the harsh rule of the mainland *conquistadores*. Other coastal indigenous groups, such as the Seri, the Yaqui or the Cucapá, also developed unique lifestyles as fishermen and sailors, with cultures finely adapted to their ocean and coastal resources (Bowen 2000, Bahre & Bourillón 2002, Felger & Moser 1985, Nabhan 2002). True to the etymology of the word, the peninsula has indeed been almost an island, isolated from the rest of Mexico, and the Gulf has been a secluded interior sea, deeply isolated from the larger Pacific (Figure 1). Even in recent decades, journalists such as Fernando Jordán (1951) have referred to this region as *el otro México* (the other Mexico). It has always been a region of fantasy and adventure, a territory of surprising, often bizarre, growth-forms and immense natural beauty.

Few places exhibit the extraordinary environmental heterogeneity seen in the peninsula of Baja California and the Sea of Cortés (Robles-Gil, Ezcurra & Millink 2001, Garcillán & Ezcurra 2003). The regional climates vary from Mediterranean-type winter rains in the north to monsoon-type summer rains in the south. The steep slopes of the mountain ranges, both on land and under water, generate some of the most dramatic environmental gradients on Earth. The northern part of the peninsula on the Pacific Coast harbors rare remnants of Californian coastal scrub, chaparrals, temperate forests and dry deserts. A rare form of tropical deciduous forest occupies the lowlands of the Cape Region on the southern part of the peninsula. Similar areas of geographic isolation and biological rarity are found in the coastal lagoons and wetlands, on the Gulf islands and in the deep-water reefs of the underwater seamounts.

The Sea of Cortés is a sort of "marine peninsula," isolated from the rest of the Pacific by the 1,500-kilometer extension of Baja California. Biologically, it is one of the most productive and diverse seas in the world (Álvarez-Borrego 1983, 2000). The high biodiversity in the Gulf of California is largely due to two phenomena: the great variety of habitats, including mangrove swamps, coastal lagoons, coral reefs, shallow and deepsea basins, hydrothermal vents and a diverse array of shore and subtidal areas (Figure 2); and the complex geological and oceanographic history of the Gulf, including past invasions of animals immigrating from tropical South America, the Caribbean Sea (before Earth's tectonic forces sealed the Panamanian seaway), the cold shores of California (during past glacial periods) and across the vast stretch of the Pacific Ocean from the tropical West Pacific. The Gulf is not only biologically important, it also

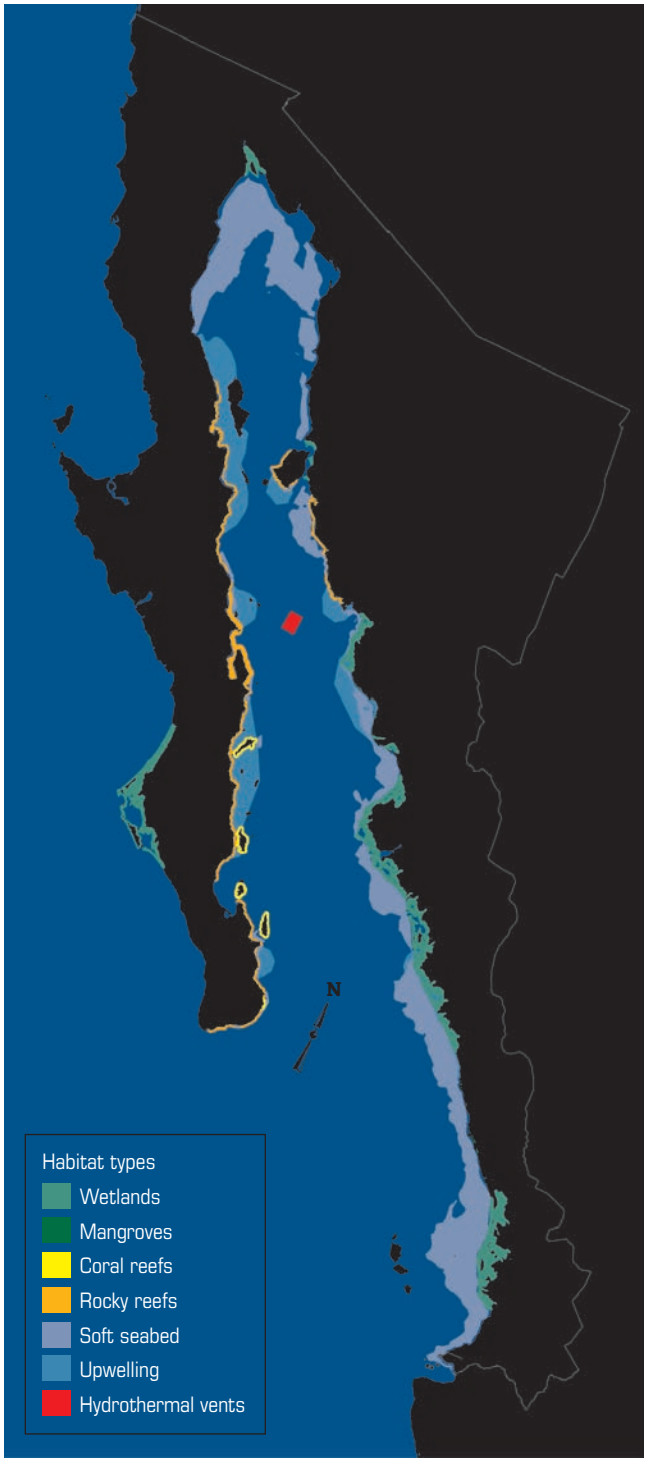

Figure 2 Coastal and marine habitats in the Gulf of California (modified from National Commission for the Knowledge and Use of Biodiversity–CONABIO).

has immense economic worth; it houses an inordinately high proportion of the marine species richness of Mexico and yields some 30 to 60% of the national fisheries catch. The sustainable use and conservation of the Sea of Cortés are critical issues from both points of view.

The Gulf of California—in both its marine and surrounding terrestrial ecosystems—is in a transition zone between bioregions identified as critically important for conservation. The Sea of Cortés is one of the most important marine ecosystems on the planet. And the Sonoran and Baja Californian deserts are part of one of the world's top five wilderness areas, making up significant portions of two terrestrial hotspots: the southern part of the California Biotic Region and the northern portion of the Mesoamerican Dry Tropical Forests (Ezcurra *et al* 2002, Mittermeier *et al* 1999). The region covers an area of 890,000 square kilometers, of which 57% (515,000 square km) is terrestrial and 43% (375,000 square km) is marine. The terrestrial portion comprises thirteen ecoregions, which include the lowland dry tropical forests of Sinaloa, the Sonoran and Baja Californian deserts, Mediterranean ecosystems of the California Biotic Province and the mountain pine and oak forests. The marine area of the Gulf stretches some 1,200 kilometers in a southeast-to-northwest direction—from the tropical waters of the southern Gulf at 22°N with clear Panamanian biogeographic influences to the colder waters of the upper Gulf at 32°N.

Fourteen of the world's 32 marine phyla are represented in the Gulf (Brusca 1980, Gotshall 1998, Thomson & Gilligan 2002, Thomson & Eger 1966, Thomson, Findley & Kerstitch 2000). An estimated half of its faunal diversity is composed of nearly 6,000 known macrofaunal (larger than microscopic animal) species. The Gulf is home to 907 fish species (more than 55% of which are species from marine families), 240 marine birds, 35 marine mammals (82% of marine mammals found in the northeastern Pacific) and 4,818 known marine macroinvertebrates (Findley forthcoming). Some authors estimate that more than 4,000 invertebrate species remain undescribed in this extraordinarily rich environment. Of all these species, 770 are endemic to the region, including the totoaba *Totoaba macdonaldi,* a giant sea bass, and the vaquita *Phocoena sinus,* the Gulf of California's unique harbor porpoise (Findley forthcoming). The Gulf has the highest diversity of large whales in the world, all of which are legally protected in Mexico. Furthermore, its marine seabed, together with 6,000 square kilometers of coastal lagoons and 2,560 square kilometers of mangrove forests, serve as reproductive, nesting and nursing sites for hundreds of resident and migratory species. The complex archipelago of the Gulf's islands—containing 922 islands and smaller islets—harbors 90 endemic species, five of which are critically endangered and 60 of which are reptilian (Case, Cody & Ezcurra 2002). Such endemism significantly contributes to making Mexico second in the world in terms of reptile biodiversity.

This vast natural wealth is not only of biological and conservation interest; it also provides the socioeconomic sustenance of the inhabitants of the region who have developed systems of natural resource use that often put the long-term sustainability of the resources in peril. The most significant threats to biodiversity are driven by the growth of economic activities in the region, which has caused the deterioration of coastal marine ecosystems due to decreasing freshwater flows, pollution by agrichemicals and urban waste, sedimentation and the use of inappropriate fishing technologies such as bottom-trawling. Critical mangrove habitat is being lost at an annual rate of 9% from the construction of shrimp ponds, marinas, inland channels and deforestation leading to sedimentation, eutrophication and changes in water flows. In addition, the invasion of exotic plant and animal species is putting at risk the native and endemic species of the Gulf's islands and the Sonoran and Baja California deserts.

The Shaping of a Singular Landscape

While most of the continental mainland of Mexico and the U.S. are attached to the North American plate, Baja California is a sliver of continental crust that is affixed to the Pacific plate. The peninsula is being very slowly torn away from the Mexican mainland in a series of deep trenches and rifts that are gradually moving the whole Pacific plate—Baja California—toward the northwest and widening the Gulf of California. The ridges and fractures that have been formed by this very active tectonic interface are the main causes of the regional topography, both on land and under water. The heterogeneous topography and bathymetry drive the local climates and oceanographic processes and ultimately are a major causal force of the region's unique biological diversity (Carreño & Helenes 2002).

In the same way the geological processes shaped the abrupt geology of the Sea of Cortés, the circulation of winds and oceanic currents is the underlying mechanism that created the region's incredible ecological variability and is

the force that maintains it. On the Pacific coast of Baja the cold California current, which flows north-to-south along the shoreline, is deflected westwards by the rotational movement of the Earth. The deflected surface waters are replaced by an upwelling of cold, nutrient-rich water transported up from the ocean floor, bringing fertility to the surface. Inside the Gulf, however, the high productivity is derived mostly from mixing of the water column caused by the tidal waves moving from its mouth toward the cul-de-sac in its northern reaches. The tide-generated upwelling is especially high in the Gulf's mid-region, where a series of islands and islets produce a tight narrowing of the sea, and in the shallow waters of the upper Gulf where the tidal flow is dissipated in 8-meter high waves that provide a strong vertical mixing of the waters. This turbulent upwelling in the mid-Gulf and tidal mixing in the upper Gulf bring nutrients to the surface and make the Sea of Cortés one of the most productive regions in the world ocean (Lavín & Marinone 2003, Lavín, Palacios-Hernández & Cabrera 2003, Marinone & Lavín 2003).

Cold seas are also the major cause of aridity on the land, as the cold waters generate low-pressure centers and a stable atmosphere that forces moisture-laden northwesterly winds from the cold Pacific onto the warm peninsula where they warm up and become drier. Only in the mountain ranges does ascending air cool sufficiently to generate significant rainfall and sustain temperate pine and oak forests. In the northern part of Baja California, the more temperate land cools sufficiently in winter to cause atmospheric condensation and induce winter rains, forming the chaparrals of the California Biotic Province. In the rest of the region, the rich upwelling of the Sea of Cortés coexists side by side with desert on the land.

During El Niño years, random variations in the airflow weaken the trade winds and the westward deflection of surface ocean currents decreases. Warm oceanic waters accumulate along the coast of the North American Continent, the upwelling of nutrient-rich waters decreases, and the Gulf waters become warmer. Thus, the natural cycle becomes inverted. As the currents slow down and the ocean warms up, the sea becomes less productive, and the land is soaked by abundant rainfall that originates from the now-warm marine waters (Holmgren *et al* 2001, Polis *et al* 1997, Velarde & Ezcurra 2002, Velarde *et al* 2004). In the Sea of Cortés region, pulses of productivity in the dry deserts are seen in opposite years from the productivity highs in the Gulf and Pacific waters.

The Evolution of Regional History

Archeological evidence of the first humans in the Gulf of California region is dated around 14,000 years ago, toward the end of the last glacial period. The land, now occupied by deserts, was at that time covered by grasslands where mammoths, horses, camels and giant sloths roamed in large numbers. In a few thousand years, as the glaciers retreated northward and the Gulf lands became hotter and drier, the changing climate and the lethal efficiency of the newly arrived nomadic hunters drove most of these large herbivores into extinction (Martin 1984). Human populations had to adapt to the absence of large game, learning to gather plants from the desert and fish from the sea. Most of them remained nomadic gatherers until the arrival of the first Europeans, but in Nayarit and southern Sinaloa, small agricultural villages developed, depending primarily on farming and on the plentiful resources provided by the extensive mangrove swamps of local lagoons.

When the Spaniards arrived in the first half of the 16th century, they found about sixteen different ethnic groups inhabiting the Gulf coast. The inhospitable climate and isolated conditions of the Baja California peninsula and the Sonoran desert made it impossible at first for the *conquistadores* to establish themselves permanently along the coast (Robles, Ezcurra & León 1999). It was not until 1667 that the Jesuits first established a mission in Baja California, and soon after an impressive chain of agricultural settlements was set up in the upland sierras of Sinaloa and Sonora and throughout the peninsula. Despite the lack of farming experience, the Cochimí natives of the central peninsula made their transition to sedentary life with apparently little effort and, in doing so, seem to have abandoned their fishing traditions. During the 18th century the missions flourished, developed a prosperous system of irrigated agriculture and served as strategic points of access to the coastal lagoons of the peninsula and to the fertile summer pastures of the cool sierras (Clavijero 1789, del Barco 1973). During the 18th century a prolonged and severe drought, coupled with the expulsion of the Jesuits from the New World, resulted in the collapse of the mission system and drove the Cochimí people into cultural extinction.

For thousands of years, the population of the Gulf of California has benefited from the marine resources of the region, exploiting the bays, coastal lagoons, river mouths, salt marshes and estuaries for food. Until the early 20th century fishing was practiced only in the inshore areas, as

vessels were small and powered by oars and sail. The main fishing techniques were lines and hooks (Robles & Carvajal 2001). After the long drought and decline of the missions, the discovery of pearls led to the exploitation of one of the most valuable resources and export items for the Spanish in the Gulf of California. The largest pearl beds in the world were located on the east coast of Baja California Sur, and in the 19th century, the city of La Paz was recognized worldwide for its pearls. By 1892, however, diving for pearl extraction had declined significantly because of the drop in oyster numbers, possibly as a result of over-exploitation. Riverine areas and lower-basin agricultural valleys have always been favored by the region's population for settlement and development. In particular, intensive settlement occurred during the 20th century in the Fuerte, Mayo and Yaqui valleys of Sinaloa and Sonora and in the Colorado River Valley on the Mexico/U.S. border. Until the 1930s the Colorado was the largest river flowing into the Gulf of California with a vast delta covering 300 square kilometers of wetlands (Sykes 1937, Fradkin 1984, Ezcurra *et al* 1988, Felger 2000). The development of steamboat traffic on the Colorado River during the 19th century was made possible partly because of the dense cottonwood forests on the riverbanks, which fed the high demand for charcoal and wood needed by the steamboats. This caused devastation of the forest—the first significant environmental impact on the oasis—but was only a prelude to the devastation the estuary had yet to see. In 1935 the Colorado River was dammed after an international water treaty was signed between the United States and Mexico, starting the development of the Imperial and Mexicali agricultural valleys but bringing about the demise of the great delta. In the same manner, dams and channel works were initiated in the 1940s on the Fuerte, Mayo and Yaqui rivers as part of a regional project for agricultural development. Economically, all these irrigation projects were extremely successful, but they left behind a substantial ecological footprint through the loss of native vegetation in the coastal zones and a reduction in the supply of freshwater and ensuing degradation of the riverine ecosystems, estuaries and associated coastal lagoons.

In the 1930s a technological revolution permanently transformed the Gulf of California; outboard motors and gillnets came into use. As a result, the totoaba—a fish endemic to the Sea of Cortés and highly appreciated for export—saw significant population declines in the Guaymas area of Sonora. Additionally, inshore fisheries in the estuaries and lagoons started to increase steadily and became a highly profitable activity. In 1933, the shrimp fishery developed the use of trawling boats over soft seabed (Figure 3). Since then, the seabed of the Gulf of California has been swept clean every year in search of "pink gold." Everything in the path of the trawling dragnet—fish, octopus, conch, sponges and starfish—is destroyed. Judged to be of lesser economic value, this unintended bycatch is returned dead to the sea. As the 20th century progressed, the shrimp fishery became the most important activity in the fishing sector with the largest contribution to regional income, jobs, supporting infrastructure and foreign income. In 1997 the five states surrounding the Gulf of California produced 57,000 tons of shrimp—approximately 70% of the national shrimp production and 90% of Mexico's Pacific coast production. The use of bottom trawlers by the shrimp industrial fleet also became one of the greatest threats to biodiversity in the Gulf, however, producing high volumes of bycatch and destroying the Gulf's soft seabed.

In the 1950s, fishing became a major driving force in regional development. The success of the fishing industry attracted financial resources to the sector and led to the establishment of freezing and packing companies and shipyards. This period was characterized by apparently inexhaustible abundance. In reality the decline of the fishing sector was already underway, driven by unsustainable harvests, over-capitalization of the fishing fleet and wasteful fishing technologies (Robles & Carvajal 2001). In the 1960s, the sardine fishery developed in the Sea of Cortés using purse seiners. These boats are still used today, and their

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Figure 3 Rows of shrimp trawlers in port in the Gulf of California. The use of bottom trawls is one of the greatest threats to the Gulf's marine biodiversity, resulting in high volumes of bycatch and destruction of the seabed.

technology represents one of the most selective fishing gears in the region. In the second half of the 20th century, the yellowfin tuna fishery developed in the mouth of the Gulf of California, and in the 1980s the Humboldt squid fishery started and is now the second most important in the area in terms of catch.

A marked increase in the price of beef in the 1980s led to the clearing of substantial areas of native vegetation using heavy machinery and replacing pristine native desert scrub and dry tropical forests with the non-native buffel grass *Pennisetum ciliare* of African origin to improve forage productivity for cattle in desert environments. Highly adapted to the hot and dry tropical environment, buffel is rapidly invading some overgrazed desert lands and, although it supports an increased carrying capacity of cattle, it is not used by the native fauna, and consequently the habitat for native species has been severely diminished. Once invaded by the rapidly growing and leafy buffel, the accumulated biomass burns easily during the dry season, turning the Gulf deserts into a fire-maintained ecosystem that burns seasonally and prevents the re-establishment of the original biologically rich scrub. Apart from its direct impact on the terrestrial ecosystems, the replacement of the native vegetation by buffel grass also represents a threat for the coastal environments, as the fire-prone new grasslands generate more sediment and silt runoff into the coastal areas and lagoons during intense monsoon rains.

Socioeconomic Overview

With some 26% of Mexico's land area and 8.8% of its population in the year 2000, the states surrounding the Gulf of California produced 9.1% of the country's gross domestic product. The Gulf is a large, still sparsely populated area with human densities of only one-third the national average. It is also a relatively wealthy region within Mexico: the *per capita* contribution of Gulf inhabitants to the country's GDP is 5% above the national average. This productive advantage is even higher in the Baja California peninsula and the state of Sonora, where the *per capita* income is about 22% higher than the national average. The region is a major contributor to the national fisheries sector, producing approximately 50% of the landings and 70% of the value of national fisheries in Mexico. The coastal plains of Sonora and Sinaloa are also major agricultural producers. Approximately 40% of the national agricultural production comes from this region, mainly supported by high-technology irrigation.

The region is not only one of Mexico's richest in terms of natural resources; it also holds one of Mexico's fastest growing regional economies. The *maquiladora* industries (corporations with special foreign investment and import/export privileges) in Tijuana, the high-input crops and associated agro-industries in the agricultural valleys (Mexicali, Tecate, San Quintín) and the booming tourism industry are all powerful driving forces in economic and demographic growth. Some selected indicators of economic development (education, housing and human fertility) show values that suggest a relatively high economic development compared to the rest of Mexico (Ezcurra 1998). For example, the peninsula of Baja California has levels of illiteracy of less than 4%; the number of houses with electricity (including rural dwellings) approaches 90%; and the mean number of live births per woman over twelve years old was around 2.4 in the mid-1990s and has been steadily decreasing since (for comparison purposes, the state of Oaxaca in southern Mexico has 17% of illiteracy, only 73% of its houses have access to electricity, and the mean number of live births per woman over twelve years of age is 3.1).

In spite of the low fertility rates, the success of the peninsular economy has brought a large demographic increase to the region, chiefly derived from immigration. While the demographic growth rates in Mexico have decreased considerably during the last decades from a national average of more than 3% to less than 2%, the growth rates in the northern states of the region—and especially in the peninsula of Baja California—still remain high. Population growth rates in the whole Gulf region averaged 2.4% for 1990–2000 while the national average was around 1.8%. Between 1980 and 2000, the state of Baja California grew at an annual rate of 5.6%, while the neighboring Baja California Sur grew at a rate of 4.9% (Table 1). The cities with the most dynamic and active economies have been growing even more rapidly: Tijuana, fueled by the immigration magnet of the *maquiladora* industry, grew at a rate of 6.5%, while the population of Los Cabos, because of a rapidly growing tourism boom, grew at the extraordinary rate of 9.7%. If these rates are maintained, Tijuana would double in population size every eleven years, while Los Cabos would double every seven years. These remarkably rapid growth rates are not due to reproductive habits; they are chiefly the result of internal migration within Mexico from the impoverished southern states into the more dynamic economy of the Gulf's border region.

Table 1

Selected demographic and economic indicators for the five states that surround the Sea of Cortés

State	Population density/sq km 2000	Population growth (%) 1980–2000	Marginalization	Per capita GDP (US$) 2001	GDP growth (%) 1980–2000
Baja California	34.8	5.6	very low	7,646	4.6
Baja California Sur	5.7	4.9	low	7,498	4.1
Nayarit	33.0	1.3	high	3,809	1.1
Sinaloa	44.2	1.9	intermediate	4,763	2.6
Sonora	12.3	2.3	low	7,838	3.3
Regional average	**20.9**	**2.8**		**6,311**	**3.4**

Sources: *Instituto Nacional de Geografía e Informática* (INEGI), *Censos de Población y Vivienda X, XI, XII* and *Banco de Información Económica.*

All these indicators show that, in terms of wellbeing, the region as a whole is significantly better off than others in Mexico—and hence its magnet-like attraction for new immigration—but there is also considerable differentiation among the five states, with only some specific zones driving the growth of the regional economy. Furthermore, most of the population is concentrated in the coastal zone where the pressure on natural resources is greatest.

Historically, the economy of the Gulf region has been based mainly on the primary sector—agriculture, fisheries and mining—and the southern continental states have maintained this economic structure. In recent decades, however, declining natural resources and new opportunities in the Gulf states have led to major shifts in the economic structure. Over-exploitation of water and soil resources by agriculture (especially in the drier parts of the region) has encouraged a reorientation toward high-value horticultural crops which provide a better return for water and soil inputs than more traditional field crops. In fisheries, over-capitalization of the shrimp trawling and inshore fishing fleets means that limited resources are shared among too many boats, and profits are low. At the same time macro-economic policy change, new trade agreements and globalization have created new opportunities in export-oriented manufacturing and industry (especially in the border states) and in services such as tourism. This new economic environment provides opportunities for conservation as well as increased threats associated with population growth and increasing conflicts over scarce natural resources.

As natural resources become depleted and new opportunities stimulate demand for these resources and for the environmental services they provide, there is increasing risk of conflict between and within different sectors over resource use. This is especially apparent in the case of common-access resources and in the absence of clear property rights or strongly enforced regulations. In the Gulf, different sectors respond to the demands of different export markets, both national and international, and the region has never been integrated economically as a single, joint economy. The current disintegration of the economy contrasts strongly with the strong local economic linkages among sectors that a vision of integrated coastal management demands.

The implications of this economic change for biodiversity conservation are significant. Decision-makers have an important opportunity to reduce the unsustainable pressure on natural resources in the region by supporting reorientation of the economy away from primary sector activities associated with the over-exploitation of natural resources. Increasing population pressures and conflicts over natural resources need to be addressed through the strengthening of property rights for fisheries and water resources and better enforcement of existing regulations. Urbanization and tourism development must be based on careful land-use planning and environmental management. Support to the development of manufacturing and industry must be balanced by increased attention to environmental standards and the adoption of environmental technologies and best practices. Hydropower development must be accompanied by increased commitment to watershed management. In many parts of the Gulf region, depletion of ocean and water resources is already driving investment and economic opportunities away. The maintenance of fundamental ecological processes and ecosystem functions is critically needed to

protect economic investments as well as biodiversity in the Gulf of California region.

There are significant and growing socioeconomic differences among the five states that compose the Gulf of California region. In recent decades, states that continue to specialize in primary products (Sinaloa and Nayarit in the southern continental region) have lost economic preeminence, while those linked to the modern export sectors (in the Baja California and Sonora border belts) have seen growth. Baja California Sur, in the southern part of the peninsula, has seen significant growth through tourism, especially in the Cape Region. Sonora, Baja California and Baja California Sur have per capita GDP 24% higher than the national average, whereas that of Sinaloa and Nayarit is lower. This pattern is paralleled by economic growth rates—with Baja California, Baja California Sur and Sonora enjoying significantly higher growth than Sinaloa and Nayarit. The differentiation among Gulf states is also reflected in levels of marginalization of their populations, meaning the limits on access to education and economic and cultural growth. While Baja California, Baja California Sur and Sonora enjoy a low or very low level of marginalization, Sinaloa and Nayarit show medium and high levels, respectively. In the period 1980–2000, economic growth in Nayarit was outpaced by population growth, indicating a reduction in economic welfare and increased marginalization of its people.

Population density reflects economic history. It is highest in Baja California (mainly in the border zone, as the rest of the state is very sparsely populated) and in Sinaloa and Nayarit; and it is significantly lower in Sonora and Baja California Sur, the two desert states. Population growth rates are higher than the national average, however, in Baja California, Baja California Sur and Sonora, and lower than the national average in Sinaloa and Nayarit, reflecting current economic opportunities.

The primary sector of the economy (agriculture, livestock and fisheries) is showing by far the most sluggish growth rates (Table 2). While the annual growth rate of the primary sector between 1980 and 2000 was 0.7%, the rest of the regional economy grew at an average combined rate of 4.7%. This indicator highlights that further economic growth through new or intensified use of natural resources seems to have reached a limit, and the areas within the region showing the highest dependence on natural resource use are rapidly lagging behind in economic development. Again, the two southern states (Nayarit and Sinaloa) are the ones with the highest dependence on agriculture, livestock and—especially important for this analysis—fisheries. Their continued dependence on primary sector activities, combined with a slowing of economic growth and increasing marginalization, raises concerns in these southern states for the overexploitation of natural resources and increased threats to biodiversity.

These economic indicators highlight some of the most pressing environmental problems of the region. On the one hand, open-access, extractive use of natural resources seems to have reached a limit and little can be expected from this sector for future development. On the other hand, the rapid growth of the manufacturing and services sectors is putting an additional strain on the regional resources. It is extremely difficult to keep supplying services such as running water and sewage to cities that double in size every ten years. Rapid demographic growth means, almost by definition, an increasing demand for and pressure on the regional resources, especially water which is scarce in the peninsula. It also means an increase in pollutants that result from the uncontrolled urban growth and from the growing pressures on the deficient sanitary infrastructure, including poor drainage and lack of water-treatment facilities. Thus, the rapid expansion of the population linked to the more successful sectors of the regional economy is mostly done at the expense of depleting underground aquifers and destroying the natural ecosystems and watersheds that surround the large urban centers.

Table 2
Economic dynamics (in terms of relative contribution of regional GDP and growth rates) of different sectors of the regional economy of the Gulf of California (in %)

Sector	Contribution to regional GDP	Growth rate 1980–2000
Agriculture, livestock, fisheries	10.3	0.7
Manufacturing	15.8	4.7
Electricity	2.4	5.8
Commerce, restaurants, hotels	22.1	3.3
Transport, storage, communications	11.7	5.6
Financial services	15.9	5.8

Sources: *Instituto Nacional de Geografía e Informática* (INEGI), *Banco de Información Económica.*

Regional Environmental Challenges

The ecology and biodiversity of the Gulf of California have already suffered considerable degradation. Some 39 species that live in the marine zone and on the Gulf's islands are classified as endangered or threatened by the Red List of IUCN–The World Conservation Union (IUCN 2000). Of these, the endemic vaquita porpoise *P. sinus* and the totoaba *T. macdonaldi* (Figure 4) are near extinction, while populations of five species of sea turtles have all but disappeared from the Gulf. Recent estimates indicate there are approximately 567 vaquita individuals, and their mortality is above twelve deaths per year, making the vaquita the most endangered marine cetacean in the world.

Over-exploitation of the fishing stocks is rapidly becoming a strongly limiting factor for the success of the regional fisheries. Twenty years ago there was a correlation between catch and effort in many of the regional fisheries: the more days the fleets fished, the more they caught. Now, that correlation is largely gone. The total landings in most fisheries are chiefly independent of fishing effort, and the catch per unit effort has decreased severely for many species. In short, the fishermen of the Sea of Cortés are often over-exploiting and, in some cases, even depleting their stocks (Sala *et al* 2004, Velarde *et al* 2004). There is also clear evidence that coastal food webs in the Gulf of California have been "fished down" during the last 30 years (i.e., fisheries shifted from large, long-lived species belonging high on the marine food chain to small, short-lived species from lower trophic levels), and that the maximum individual length of fish landed has decreased significantly (about 45cm) in only 20 years (Sala *et al* 2004).

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Figure 4 Found only in the Gulf of California, the totoaba—a species of large croaker—is in danger of extinction.

In some fisheries, the tragedy of common-access resources has hit the Gulf very hard. For example, 30 years ago the shrimp trawling fleet in the Gulf was around 700 boats, each of which captured about 50 tons of shrimp per season. Now the fleet is almost 1,500 boats and the annual catch scarcely surpasses ten tons per boat. Despite government subsidies of around US $30 million each year provided in the form of cheap fuel, many boats of the fleet are facing economic collapse.

Environmentally the situation is also discouraging, especially in the case of the shrimp trawlers. The bottom trawlers kill some 200,000 tons of unintended bycatch every year for a meager annual catch of about 30,000 tons of shrimp. In so doing, the dragnets also destroy some 30,000 to 60,000 square kilometers of seabed, much of which lies within the Upper Gulf Biosphere Reserve. The boats also collectively emit some 30,000 to 40,000 tons of greenhouse gases derived from the government-subsidized cheap fuel that keeps their inefficient business going. The seabed has been so depleted in some parts that the local artisanal fishermen in places such as Loreto Bay and Bahía de los Ángeles have been demanding the establishment of no-take zones and marine protected areas. In open conflict with the local communities, the larger fleets oppose the establishment of protected areas and demand permits to trawl inside the already established reserves to increase their scanty earnings. In the Gulf, conflict between sectors and particular interests has been the rule.

Not all stories of common resource use in the Sea of Cortés are despairing tales of unsustainability and collapse, however. There are also a number of success stories, and understanding these stories is fundamental for future conservation efforts. For example, local artisanal fishermen have started to work with local researchers in the Sea of Cortés to understand the phenomenon of spawning aggregations to identify and protect reproductive areas. As a result of the pressures from these local resource users, the Loreto Bay is now a marine park, and the fishermen of Bahía de Los Ángeles are supporting the creation of a similar marine protected area. In the San Ignacio Lagoon, fishermen who previously engaged in unsustainable practices have organized to preserve the environment and are training their people in basic natural history to organize whale-watching tours.

The abalone and lobster cooperatives of the Pacific coast of Baja provide yet another example of long-term sustainable use. With no support from the federal government, they have established strict rules for resource extraction and have developed their own law enforcement system. Many generate their own electricity, run their own canneries and finance their own schools. More than 40 years after their establishment, productivity remains high and their natural resources seem to be in fairly good shape.

It is not only small communities and conservationists that are critical of some of the region's unsustainable modes of development; a growing number of entrepreneurs and business people are also becoming committed supporters of the environmental cause. Even large fishing fleets can be sustainable when their operators work in cooperation. In contrast to the failure of the shrimp bottom-trawling fleet, the sardine fishery has been capable of controlling its own fishing effort, and—after a past collapse—their fishery is now healthy and sustainable (Cisneros-Mata, Nevárez-Martínez & Hammann 1995, 1996, Lluch-Belda, Magallón & Schartzlose 1986). As a result of growing concerns about these issues, a cluster of environmentally concerned business leaders working with environmental non-governmental organizations (NGOs) has organized an action and opinion group called *Noroeste Sustentable Iniciativa* (Sustainable Northwest Initiative), or *Iniciativa Nos,* to promote the sustainable use of the resources in the Sea of Cortés. In short, although the Sea of Cortés is undergoing extreme pressures from overfishing in many areas, with the consequent collapse of some of its resources, it also harbors a number of successful and encouraging experiences from communities that are trying to maintain their resources—healthy and productive—for the future.

Institutional Capacities

Viewed from the center of Mexico, the Gulf of California appears to be a uniformly distinct region formed by five coastal states with a hot, dry climate. From inside the region, however, it is evident that the different states face very different problems and there is little internal cohesion in the policies and views on natural resource management.

For many decades following the 1920s, the political and economic stability of the Gulf of California region has been based on three things:

- A political system dominated by a single party that handled the main negotiations between federal and state governments
- A cooperative structure of government, both at the federal and state levels, with party-controlled unions of industrial workers and farmers
- The involvement of major private interests in the region

This system started to change slowly in the 1980s, when the federal government decreased its support to the previously dominant unions and the union system started to dismantle. In the Gulf of California this meant the disarticulation of the main cooperative structures that operated within the fishing and agricultural sectors. This change allowed the private sector to gain a central role in these activities, while the federal and state governments retreated from direct oversight of production to assume a new role as regulator, financier and referee in the resolution of regional conflicts.

Later, in the 1990s, the democratization of Mexico brought on further change. One-party rule is no longer the norm in the region, and multi-party politics result in debates over governance, sovereignty and decision-making for natural resources. With three different parties governing the different states around the Gulf, there is now a more diverse and complex outlook. And, as the states have demanded more independence from federal rule, local governments now represent more freely the demands and necessities of their people, often in conflict with neighboring states or even with the previously all-powerful federal government.

Institutional change is still underway and more reforms are being demanded by local governments. The federal authorities still retain a high degree of political, fiscal and economical centralization, collecting most of the tax revenue and managing the national budget. The state governments are almost completely dependent on the federal government in fiscal terms, and an almost absolute dependency on the state in economic and regulatory terms persists for the municipal authorities. All this has lead to a growing complexity in the definition of priorities for regional development among the three levels of government, with poor coordination among authorities and increasing dispersion of resources and actions. Although political change has swiftly taken place around the Sea of Cortés, the reformed institutions have not yet been capable of tackling the urgent issues of resource degradation in a coordinated fashion.

One of the key difficulties faced in reversing the trend of environmental and resource degradation has been the notorious absence of a well-developed, consolidated relationship between environmental scientists and decision-makers.

Figure 5 Protected areas with marine components established by Mexico in the Gulf of California Region (modified from National Institute of Ecology).

The Sea of Cortés region harbors some of the most outstanding environmental research centers in Mexico, but most of this research rarely reaches the sphere of decision-makers. Another element contributing to the failures to preserve the natural resources of the Sea of Cortés is the sheer intricacy of the endeavor. Although the region is one complex, interconnected set of biological communities, the governance is fragmented and most of the research done has been based on narrow, specific aspects of conservation rather than addressing the complex functioning of the regional ecosystem. Few of the regional research and conservation efforts have concentrated on a multidisciplinary approach, with little effort placed on large-scale, ecosystem-based research.

Changes over the past decades, however, have brought some positive transformations. As described in the previous section, globalization of trade and the new open markets have produced a shift in the economy from unsustainable resource extraction to services and manufacturing. In response to this, some of the pressures on the Gulf's open-access natural resources have declined. In contrast, the development of the region has not offered solutions to the old problems of social inequality and territorial isolation. And, despite the common interests among the majority of environmental conservation institutions in the region, the links of cooperation between them are scarce. The region has not been able to develop a common societal vision which would allow planning for a sustainable future and collectively working to ensure that future development also allows conservation of the region's rich natural heritage.

Conservation Efforts

In the midst of all the political and economic changes the region has undergone, both the Mexican government and conservation NGOs have developed actions to protect the incredibly rich and increasingly endangered ecosystems of the Sea of Cortés, Baja California and the neighboring mainland (Zavala *et al* 2001, Ezcurra *et al* 2002b, Ezcurra 2003). In total, 29 Protected Natural Areas have been established—ten in the U.S. and nineteen in Mexico—for conservation of the natural wealth of this bioregion. Of these, 23 are terrestrial, two are marine and four have both marine and terrestrial portions (Figure 5). The total surface under protection is 98,755 square kilometers (11% of the regional area), of which 14,404 square kilometers are marine (4% of the region's marine area) and 86,350 square kilometers are terrestrial (17% of the region's terrestrial area). Importantly,

the capacity to manage protected areas in Mexico in general, and in the Sea of Cortés in particular, has improved during the last decade as a result of additional financial resources from the Mexican federal government and increased support from private groups.

Since 1993 there has been an immense effort in Mexico to protect new areas in and around the Sea of Cortés. Indeed, between 1993 and 1998, there were six new protected areas decreed, totaling more than two million (2,612,126) hectares under some category of protection. In 1993, the Mexican government issued a decree under the Biosphere Reserve protecting the upper Gulf of California and the delta of the Colorado River along a coastal strip of desert lands and coastal ecosystems that join the Sonoran desert with the Baja California peninsula. The creation of this wilderness protected area was achieved largely thanks to the initiative and support of local conservation groups and academic institutions. The new upper Gulf reserve protected two highly endangered marine species: the vaquita porpoise *P. sinus* and the totoaba *T. macdonaldi*. The most remarkable aspect of the project, however, was the wide cooperation it involved. The creation of these desert and coastal reserves was based on the participation of many groups, including indigenous peoples like the Cucapá and the Tohono O'odham, conservation groups like Pronatura, Conservation International, The Nature Conservancy and the Audubon Society, and many academic and research organizations. Some of these organizations eventually coalesced into a conservation bloc called the Sonoran Desert Alliance.

During 1993, the Mexican government prepared a series of documents for presentation to UNESCO to dedicate the Vizcaíno Biosphere Reserve as a World Heritage Site. Shortly afterwards, new decrees followed:

- With cooperation from researchers of the *Instituto de Ecología* (in Jalapa), the California Academy of Sciences and the University of California at Los Angeles, the Mexican government issued a decree for the protection of the Revillagigedo Archipelago in the Pacific.
- Six months later in June 1994, a decree was issued to protect the Sierra de la Laguna in Baja's Cape Region.
- Following a 1995 initiative from Pronatura Peninsula de Baja California, a Mexican NGO, the greatest and most diverse reef in the Sea of Cortés became officially protected under the name of *Parque Marino de Cabo Pulmo*.
- Finally, in July 1996, a decree was issued to protect the Loreto Bay as a marine park. It is remarkable that the creation of this last park was totally the result of a grassroots initiative from the local small fishermen, who were concerned about the continuing decrease of their catch and about the degradation of the hatching grounds of their fisheries.

In 1997, working to promote a conservation agenda, a group of scientists and conservationists—including 30 academic, government and conservation organizations—teamed up in a project known as the Coalition for the Sustainability of the Gulf of California. Among other activities, the Coalition produced scientific information for the region that became a milestone in regional planning. Indeed, the most relevant initiative of the federal government for the Gulf is the *Ordenamiento Ecológico,* i.e., the Regional Marine and Coastal Use Plan. To support the development of this initiative with the most up-to-date scientific information and analysis, the Coalition organized a region-wide biodiversity conservation priority-setting workshop. During the workshop, 180 experts identified 22 marine and 20 terrestrial areas of high biodiversity importance (Figure 6). The final document included a comprehensive conservation priorities map, which in turn provided important information for a range of institutions to use in coordinating and developing conservation strategies in the region.

A complementary process developed through a regional alliance of NGOs—the Alliance for the Sustainability of the Mexican Northwest Coastline, or ALCOSTA, which is composed of 20 conservation groups. ALCOSTA defined a regional vision to unify conservation efforts. Through their rich network of cooperation, ALCOSTA was capable of bringing a voice of alarm and concern into the *Escalera Náutica* (Nautical Ladder) tourism development project, thereby initiating an important effort to diminish the environmental impacts of the project and transforming the initiative forever. Partly as a result of these efforts, President Vicente Fox recently announced that the Gulf of California is a joint priority for both tourism development *and* conservation. As a result, current conservation initiatives are being directed toward enlarging the protected areas in the Gulf's islands to include surrounding waters.

The Sustainable Northwest Initiative *(Iniciativa NOS)* was recently formed by a cluster of environmentally concerned business leaders. Working under the model of the United States' Chesapeake Bay program, these leaders are developing a common vision for sustainable use of the living resources of the Sea of Cortés through high-level regional

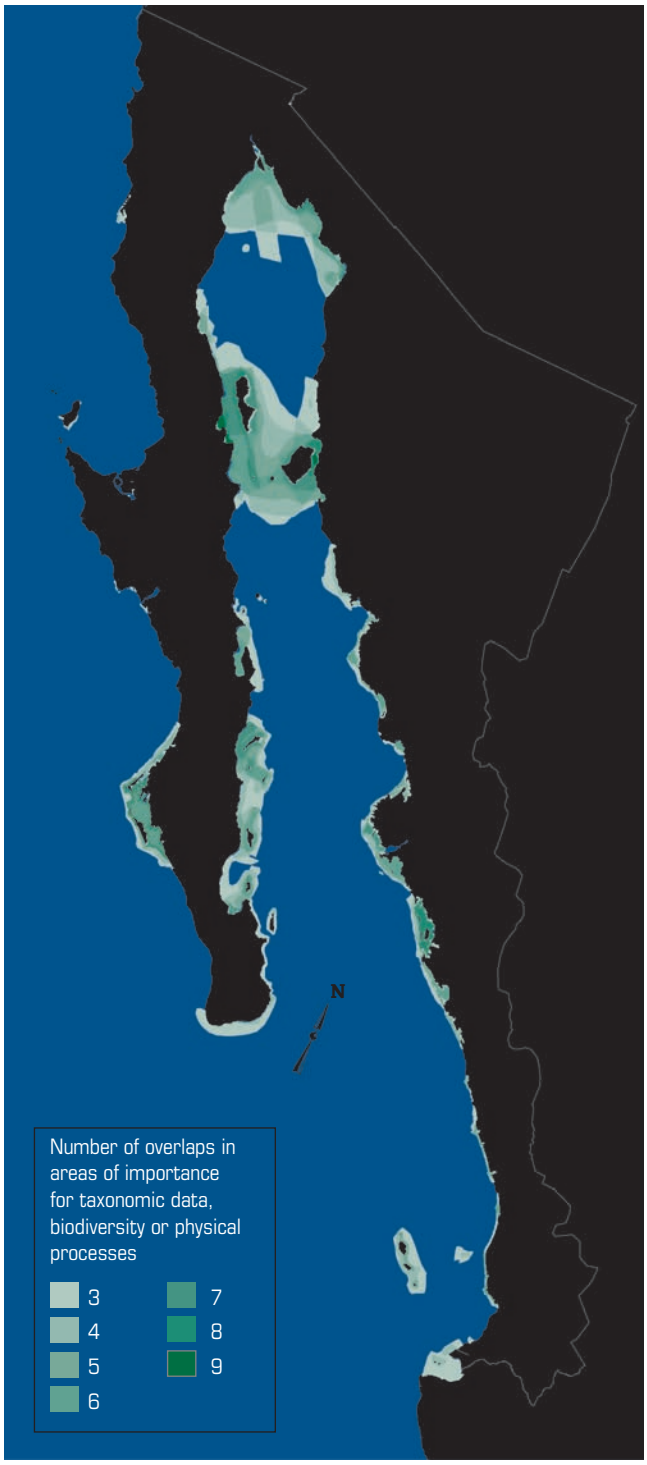

Figure 6 Marine areas of biological importance in the Gulf of California.

agreements between government and business. As entrepreneurs, they perceive there is value in conservation in order for their businesses to survive in the long term. As concerned persons, they also feel a responsibility for future generations—a historic imperative that must be met.

Toward a Regional Conservation Agenda

In spite of difficulties in maintaining its resource productivity and the past collapses of its fisheries, the Gulf of California region still presents great economic potential, but governance is a critical factor for regional development. The region is governed under a complex mix of authority emanating from the federal government, the surrounding five states and 40 coastal municipalities, and there is often little synergy among them. Poorly planned economies, often the result of the lack of coordination among authorities, are one of the greatest threats to ecosystems in the Gulf of California.

On the other hand, regional cooperation among non-governmental agencies has yielded impressive results in the past. Through their rich network of cooperation, ALCOSTA, the regional alliance of NGOs, for example, was able to make the *Escalera Náutica* development project much more open to environmental conservation issues. Likewise, the Coalition for the Sustainability of the Gulf of California has produced some of the most notable conservation milestones for the region. And cooperation between regional NGOs and research groups allowed the presentation of a regional agenda at the *Defying Ocean's End* Conference in Los Cabos in 2003. This cooperative agenda established seven specific objectives to approach sustainability in the Sea of Cortés.

1. Improve the management of regional marine and coastal protected areas

Although impressive progress has been made during the last decade by the Mexican government in the funding and management of its protected natural areas, many of them still exist as "paper parks," with inadequate funding and little effective management. If the regional protected areas are to be effective in their conservation goals, they must improve in their level of funding, equipment and staffing.

2. Enlarge the system of marine and coastal protected areas

Although some marine protected areas have been created in the Gulf (namely, the Upper Gulf Biosphere Reserve and the Cabo Pulmo and Loreto Bay National Parks), these cover less

than 4% of the Gulf's marine area. If effective conservation in the region is to be achieved, a significant increase in the marine protected areas must be obtained, reaching at least 15% of the Gulf's waters. This would allow the protection of spawning aggregation areas and critically endangered ecosystems such as seamounts, coastal lagoons, coral and rocky reefs, estuaries and marine mammal habitats (Sala *et al* 2002a, b).

3. Develop a comprehensive plan to manage and protect priority coastal wetlands

The degradation of coastal wetlands is one of the Gulf's most serious threats. With little consideration for the ecological services they provide, mangrove forests are being cut for the development of aquaculture—mostly shrimp farms—and tourism projects. Furthermore, coastal wetlands in general are threatened by increased water consumption upstream and by pollution of rivers and waterways. The ecological services provided by estuaries and lagoons are critical for the survival of the Sea of Cortés fisheries and for the health of the large marine ecosystem as a whole. A comprehensive plan to protect coastal wetlands, stop mangrove deforestation and maintain the ecological services of coastal lagoons and estuaries must be developed and its actions implemented immediately.

4. Reduce the shrimp trawling fleet and improve its fishing technology

Many of the strongest issues of unsustainability in the Gulf stem from the destructive effect and the economic inefficiency of the current shrimp bottom-trawling fleet. The only alternative to solve this growing problem is to reduce the fleet by at least 50% through a legal buyout. If effective legal means are put in place to ensure that no new fishing permits are issued in future—and hence not allowing the fleet to grow again to unsustainable levels—an action of this sort would allow the negotiation of effective enforcement within existing no-take zones and the introduction of better fishing gear with more efficient excluder devices.

To address this challenge, Conservation International and other partners in the region have developed a strategy with three major objectives:

- Reduce the fishing effort to optimal economic levels, with buyout of 500 shrimp vessels currently operating
- Promote the use of modified bottom-trawling equipment that is less harmful to the environment
- Restrict bottom-trawling in the critical areas for biodiversity conservation that were identified by the Coalition for the Sustainability of the Gulf of California in its regional exercise on conservation priorities

5. Develop a regional plan to regulate the use of land, coasts and waters

The main instrument in Mexican legislation to regulate the use of space within environmental guidelines is the *Ordenamiento Ecológico,* or Ecological Planning of the Territory. This plan demands full and comprehensive hearings and negotiations with local governments, local businesses and non-governmental organizations. Because of its complexity, effective territorial planning has been difficult to achieve in the Sea of Cortés but is now one of the most urgent objectives to reach. For this purpose, the participation of the general public and local conservation alliances is of critical importance.

6. Reorient regional tourism toward low-impact, environmentally sustainable resource use

The *Escalera Náutica* has become one of the most debated projects in the region. On the one hand, most environmentalists agree that in the Gulf the primary sector of the economy has reached its limits and, in some cases, is even facing collapse. Thus, a shift of the economy from unsustainable fisheries and water-intensive agriculture to the services sector (including tourism) seems a desirable move. However, experiences in Mexico with unsustainable tourism (and its failed and abandoned projects, dredged mangrove swamps and exhausted aquifers) have left a deep scar. The big challenge in the Sea of Cortés seems to be how to promote environmentally sustainable tourism while ensuring the preservation of the natural beauty and the biodiversity of the region, the very attributes that have triggered tourism.

7. Articulate a common regional vision for development and build capacities for regional management

Regional conservation will be successful if, in collaboration with local business and political leaders, a regional development vision based on the long-term protection of the Gulf and its resources can be pieced together collectively and agreed upon. *Iniciativa NOS* has been created as an *ad hoc* vehicle to promote and articulate the common regional vision and help develop the regional capacities for manage-

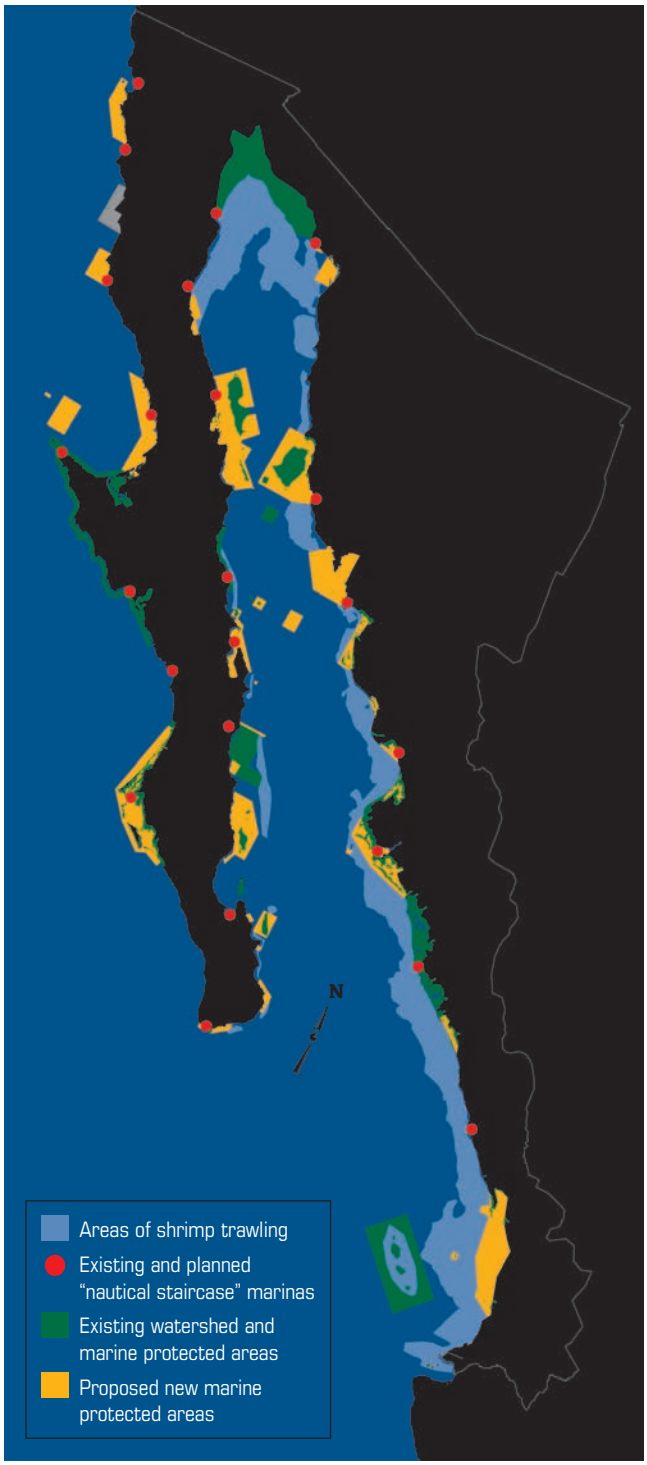

Figure 7 Marine conservation priorities for the Gulf of California.

ment in close relationship with major stakeholders and governments.

This seven-point agenda, catalyzed by the *DOE* meeting, is now a conservation roadmap for the years to come (Figure 7). To facilitate well-planned sustainable development, it is important to build a common regional development vision and establish a highly motivated and committed group of leaders from businesses, environmental organizations, civil society and government to work together on common regional goals. The creation of a regional development vision with well-defined scenarios for the future has been among the top priorities of NGOs, government, academics and business leaders in the region to define a workable and viable agenda. This agenda is based on five fundamental tenets:

1. Collaborative inter-sectoral efforts to define solutions to threats are critical for success at a regional scale.
2. Improved governance structures are key to effective natural resource management.
3. Adequately managed marine protected areas are fundamental to control open access and support fisheries management.
4. Behavioral changes promoting negotiation as a major mechanism for conflict resolution produce more long-lasting results than imposing the values of one group on another.
5. Sustained progress toward measurable goals should be made at the scale of the regional large coastal ecosystem.

The rich technical information generated by the Coalition for the Sustainability of the Gulf of California is now being used by a group of the Gulf's key stakeholders congregated around *Iniciativa NOS*. The aim of this group is to analyze the environmental issues the region is facing and address them through a region-wide agreement. This agreement should have clear, ambitious and measurable long-term goals for key areas (including Natural Protected Areas, fisheries, tourism and water) and should include a comprehensive implementation plan. To put this vision into practice a permanent structure needs to be created, including a policy board, a scientific board, technical staff and a permanent financial commitment from regional governments and funding agencies for the core funding needed to operate the initiative.

The participatory process initiated with the establishment of *Iniciativa NOS* has already yielded a better understanding of the context necessary to develop a suc-

cessful regional agreement that considers biodiversity conservation priorities as it builds economic opportunity in the region. The final regional vision must be designed to work with several other plans being implemented in the region, supporting efforts rather than duplicating them. The next step in this initiative is to attract business leaders and government agencies to support the agreement and build broad-based support. If successful, this important initiative will encourage the governments of the five states that surround the Gulf of California and the federal government to sign a regional agreement for sustainable development and commit to its implementation.

Summary

Hopefully, the increasing pace of conservation efforts will stall the environmental degradation the Sea of Cortés has been suffering and diminish the threats to its long-term sustainability. There seems to be a growing awareness in the region, as never before, of the need to take urgent action to protect the environment. Conservation groups, research institutions, federal and state governments, conscientious businesspersons and ecotourism operators have all been contributing to the growing appreciation of the environment.

It was not by accident that the first Mexican marine protected area—the Upper Gulf Biosphere Reserve—was created in the Sea of Cortés. A number of institutions and organizations in both Mexico and the U.S. had been working together for years promoting the conservation of the Upper Gulf and the Colorado River delta. Research institutions, conservation groups and governmental officials had all been teaming for years in discussion forums, preparing plans and proposals for the first marine protected area in Mexico. The time finally came when a proposal to protect the Upper Gulf and the coasts of the Colorado River estuary was ready and had the consensus and support of hundreds of environmental leaders (Ezcurra *et al* 2001).

It is now time to develop a new vision—a social agreement among sectors that will drive regional development for years to come, with ever-increasing consideration for the Gulf's environment and natural resources, and their sustainability. The Sea of Cortés receives what remains of the discharges of the Colorado River basin, and the survival of the Upper Gulf is a challenge for both Mexico and the United States. Thus, its larger basin is part of a binational wilderness, for which both Mexico and the U.S. share the responsibility of protecting their joint natural heritage, and both countries need to develop further and continuing efforts to promote truly cooperative work. Through the growth of alliances we may, in the end, preserve the Gulf of California. The region is a single large continuum with shared watersheds and estuaries, species and natural resources. The protection of these unique environments is of the utmost importance for the survival and wellbeing of all of us, now and for generations to come.

Acknowledgements

The authors would like to acknowledge the many people who contributed to the Defying Ocean's End *process, especially in the development of this case study. In particular, we wish to thank Juan Bezaury of The Nature Conservancy–Mexico; Ernesto Bolado, Nohemi Camacho, Mauricio Cervantes and Roberto Gonzalez of Conservation International–Mexico; Charlotte Boyd of Conservation International–USA; and Stephen Olsen of the Coastal Resource Center, University of Rhode Island.*

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