

VI

Mexican Indigenous Groups of the Border Region

John A. Peterson and Michael Wilken-Robertson

ABSTRACT

The indigenous cultural heritage of Mexico's border region includes native tribes—defined as relatively small, rural populations living on communally held ancestral lands—and migrant indigenous groups—which are larger populations of indigenous descent living in urban areas or agricultural settlements, usually without a community land base. This study examines the state of the environment of both native and migrant groups within the Mexican border region, which is defined as extending 100 kilometers (km) south of the U.S.-Mexican international political boundary.

Just as this definition is problematic when considering ecosystems, watersheds, and other natural configurations, it likewise leads to arbitrary distinctions when discussing tribal nations of the border region. For example, the territory of some groups, like the Papago, extends beyond the 100-kilometer zone and the people maintain constant contact with other closely related tribal nations beyond the border region. Other groups, such as the Paipai and the Kiliwa of Baja California, live outside the 100km range but are closely tied culturally, socially, politically, and economically to indigenous and non-indigenous populations within the range. The Pai, Yaqui, and Pima comprise closely-related groups on both sides of the border but their entire territories are north and south of the 100km designation.

For migrant indigenous groups the concept of the border region is even more problematic because their residences may vary anywhere from a few hours or days in one place to permanent settlements of transplanted ethnic *colonias* (neighborhoods) in urban areas such as Ciudad Juárez or Tijuana. Furthering the confusion, the United States and Mexican governments recognize only a few tribal peoples and many ethnicities and communities slip through the perceptions and the realities of the saltcedar curtain.

Environmental issues affecting border tribal peoples include problems with air, water quantity and quality, toxic wastes, population, health, and economic opportunity. Tribal peoples inhabit a landscape that has been impoverished by overgrazing; depletion and contamination of water resources; mineral extraction and energy production; and social problems arising from the narcotics trade, the militarization of the border, and governmental neglect. They share these problems with all inhabitants of the border, but tribes are chronically under-represented, underemployed and under-served by governmental programs. The true state of indigenous endemic population and migration is unknown. Native world-views differ radically from those of the dominant culture. Priorization of environmental problems and problem-solving strategies are often envisioned differently than the dominant culture.

The biggest problem, however, is the lack of data and inclusion of tribal nations in the process of discovery and sustainability. The gaps in our knowledge are fundamental, ranging from the basic issue of inadequate demographic characterizations to a different world view and styles of communication and problem-solving. This chapter presents a survey of the scant literature of indigenous issues in the borderlands and aims to develop a research strategy to address the issues identified. This first-hand knowledge has been discussed with tribes in Baja California (Wilken) and the Tigua of Ysleta del Sur Pueblo (Peterson).

The authors' respective involvements with tribal nations has provided a sense of what the future research agenda should entail and how it should be conducted.

First, adequate demographic modeling using ethnographic methodologies is critical to understanding who the tribal nations are and how they are adapting to transnational limitations and opportunities. Tribal nations from throughout Mexico and the borderlands exhibit a tremendously resilient and flexible adaptive capability that is subaltern and often in contradiction to transnational laws and boundaries. The few successful economic strategies such as Indian gaming facilities are more than counter-balanced by the historical degradation of Indian lands by inappropriate land-use strategies and expropriation of resources by the dominant culture. Ironically, even the successful casino enterprises of the Tigua and the Kickapu in Texas have been terminated by the State of Texas, leaving these tribes even fewer economic opportunities.

Second, engagement with tribal groups on an empathic basis is essential for understanding tribal concerns from within the context of their own traditional practice and world-view. There may be no direct correlation with the criteria and agendas of governmental agencies, as tribal members draw from a wealth of knowledge and cosmology largely unknown and sometimes diametrically opposed to those of the dominant culture.

Third, strategies for problem recognition and resolution must come from within the tribe and from an integration of tribal world-views with the issue-oriented focus of governmental agencies.

Finally, the maintenance and sustainability of tribal culture and practice depend integrally on the landscape, and any strategies for sustainability of the border environment need to incorporate landscape integrity, including viewsheds and open space as well as a concern for resources and contaminants or strategies for economic development. This could be a lesson for all those who strive to preserve and promote environmental quality in the borderlands.

INTRODUCTION

The indigenous cultural heritage of Mexico's border region includes native tribes—relatively small, rural populations living on communally-held ancestral lands—and migrant indigenous groups—larger populations of indigenous descent living in urban areas or agricultural settlements, usually without a community land base. This study examines the state of the environment of both native and migrant groups within the Mexican border region, thus defined as extending 100 kilometers south of the U.S.-Mexican international dividing line.

Just as this definition is problematic when considering ecosystems, watersheds, and other natural configurations, it likewise leads to arbitrary distinctions when discussing tribal nations of the border region. For example, the territory of some groups such as the Papago extends beyond the 100-kilometer zone, and they also maintain constant contact with other closely related tribal nations beyond the border region. Other groups such as the Paipai and the Kiliwa of Baja California live outside the 100-kilometer range but are closely tied culturally, socially, politically, and economically to indigenous and non-indigenous populations within the range. The Pai, Yaqui, and Pima comprise closely-related groups on both sides of the border but their entire territories are north and south of the 100-kilometer designation. For migrant indigenous groups, the concept of the border region is even more problematic because their residence may vary anywhere from a few hours or days to permanent settlements of transplanted ethnic *colonias* (neighborhoods) in urban areas such as Ciudad Juárez or Tijuana.

The fiction of a border between the sovereign states of the United States and Mexico in the 1850s has been a recent event in the lives of tribal nations in the borderlands. For at least 12,000 years nomadic people have travelled through the region, and for the last 2,000 years sedentary people have constructed hamlets and villages. Their distinctive ceramic styles denote ethnic and tribal identity that are indifferent to the current political divide. The earliest Spanish entradas in the late 16th century depict distinct ethnic groups living in small villages, traveling widely from river to mountain terrain, and depending on a broad mix of horticultural, hunted, and gathered resources. Exchange of raw materials throughout the region of what is now northern Mexico and the American Southwest and South Texas demonstrate a familiarity with resources from afar as well as information and material flow. In the 18th and 19th centuries Apache, Yaqui, and Southern Plains tribes such as the Comanche used the border as a convenient refuge from either government and roamed widely for raiding and trading. Some people, such as the Yaqui and the Tigua of Ysleta del Sur Pueblo in El Paso, were occasionally allies of the Mexican or American military.

The Mexican system of Mission and Presidio provided a base for pacifying tribes, and land grants in Nuevo Mexico and Nuevo Vizcaya still survive as legal territories for tribes in both countries. The reservation system in the United States, established in the late 19th century in the region, was re-affirmed in the 1930s with the Indian Reorganization Act. Tribes and their territories were federally recognized and given access to government assistance. In Mexico, no similar institutionalized

relationship ensued, but tribal nations were thought to represent an essential element of Mexicanidad, and were included in ejido land reform programs in the same period.

Despite these governmental efforts to define and manage tribal nations, however, there has been little real representation of their rights, lifeways, or economic security. Today, the land grants and reservations of the estimated 80,000 tribal members residents in the border region provide few resources for economic development or sustainability. Native people share the abundant environmental problems of the borderlands with the general population, yet have little opportunity for development or maintenance of cultural identity. Landscapes that have been cosmologically integral with tribal identity have been compartmentalized, degraded, and often usurped by dominant Mexican, Mexican-American and American populations and economic interests.

In spite of the problems the political border creates, the 100-kilometer limit has the advantage of bringing into focus a few rural native groups and urban migrant groups whose environments are directly impacted by the border. While this study should not be construed as a complete vision of the impact of the border on U.S. and Mexican tribes and their environments, it will examine key issues and indicators of region-wide significance and identify some of the many missing components to guide future research and policy. Perhaps the most consistent finding of this study is the notable lack of published or reliable baseline information—particularly quantitative data such as that used for indicators—for Mexico's border tribes and their environments. The data that exists is dispersed, embedded in databases, or simply unpublished and would require a major study to compile and synthesize.

This chapter provides an overview of the present state of knowledge of tribal nations in the borderlands and an evaluation of environmental issues that impact them. But first a caveat: Very little is known of the contemporary status of tribal nations in the borderlands, and most of what is known is anecdotal. They live in both urban and rural settings. They are both corporate and dispersed. They are often highly mobile and migrate both legally and illegally across the border. They now comprise people previously thought limited to southern or central Mexico along with the historically known border tribes.

Environmental issues impacting border tribal nations include the gamut of air, water quantity and quality, toxic wastes, population, health, and economic opportunity. Tribal people inhabit a landscape that has been impoverished by overgrazing, depletion and contamination of water resources, mineral extraction and energy production, and social problems arising from the narcotics trade, the militarization of the border, and governmental neglect. They share these problems with all inhabitants of the border, but are chronically under-represented, underemployed and under-served by governmental programs. The true state of the tribal nation population and migration is unknown. Native world-views differ radically from those of the dominant culture. Priorization of environmental problems

and problem-solving strategies are often envisioned differently than the dominant culture.

Mexican federal government agencies do provide important sources of information, although none offer datasets specific to tribal nations of the border region. The National Indian Institute (Instituto Nacional Indigenista, INI in Spanish) administers federal programs designed to assist tribal nations. The INI website, <http://www.ini.gob.mx/>, includes monographs on many tribes (including the Kikapu and Papago), a socio-economic database and other useful information. The National Institute of Statistics, Geography and Information (Instituto Nacional de Estadística, Geografía e Informática, INEGI in Spanish) website, <http://www.inegi.gob.mx/>, offers statistical and geospatial data. The Secretariat of Environment and Natural Resources (Secretaría de Medio Ambiente y Recursos Naturales, SEMARNAT in Spanish) has an environmental database as well as information on environmental conditions and programs involving indigenous communities, however there is no Tribal program such as that of the EPA; the website can be found at <http://www.semarnat.gob.mx/>. The Secretariat of Health (Secretaría de Salud) compiles information based on monthly reports from its doctors throughout the nation and synthesizes this information into the National Health Information System (Sistema Nacional de Información en Salud, SINAIS); this includes information specific to indigenous communities. This information can be accessed at <http://www.salud.gob.mx/index.html>.

Other important sources of information are the Southwest Center for Environmental Research and Policy (SCERP), which has commissioned specific studies on border tribes, including the study "Indian Groups of the California-Baja California Border Region and Border Environmental Issues" (Kilpatrick, Wilken, and Connolly 1997). SCERP's website can be found at <http://www.scerp.org/>. The Native Cultures Institute of Baja California (CUNA in Spanish), a Mexican non-profit association working with the indigenous tribes of the peninsula, has published several studies of baseline environmental information and sustainable development in Baja California's Kumiai, Cucupá, Paipai, and Kiliwa tribes. CUNA's website is <http://www.cunabc.org>. Back issues of the journal *Borderlines*, which include several articles on issues facing border tribes, can be visited at the Americas Program website at www.americaspolicy.org.

WHO ARE THE TRIBAL NATIONS OF THE BORDERLANDS?

There are endemic and institutional problems that have contributed to the relative disenfranchisement of native people. First, there is very little knowledge of who comprises native populations and what tribal entities exist. U.S. federally recognized tribes are few in the borderlands, and these are groups that have had long-term historical relations with the U.S. or their states of residence. In Texas, only the Kickapu and the Tigua of Ysleta del Sur Pueblo are federally recognized. However, numerous indigenous ethnicities are known to reside in the region or to migrate to or through the region. The Piro-Manso-Tigua of Las Cruces, New Mexico, were formerly from what is now Texas. They are neither federally recognized nor included in any inventory of tribes or population. In Arizona the

Tohono O'odham are federally recognized, but numerous ethnicities and tribal members from Yaqui, Apache, Pima, Tepehuan, and other Sonoran Desert people are known to be informally resident in southern Arizona. In Ciudad Juárez there are corporate settlements of Tarahumara from the Sierra Madre and Mixtec, Chontales, Huave, Zapotec, and Maya people living in small groups often sheltered by the corporate communities. In Mexico, the Instituto Nacional Indigenista (INI) recognizes 32 different ethnic groups (www.ini.gob.mx), while some anthropologists argue that there are at least 60, and others, based on linguistic identity, propose as many as 100. Representatives of all of these different groups are thought to be potentially resident in the borderlands as well as the interior of the United States as participants in labor migration from southern and central Mexican communities. These groups are made up of more than 6 million people. Their presence in the borderlands is statistically undocumented, but given the increase in population of over 50% in Ciudad Juárez from 1990 to 2000, even a small percentage of the 400,000 immigrants during that period would be a substantial number of tribal nations.

Many of these indigenous immigrants are not members of corporate groups or even recognized communities in the borderlands. Many are illegal border-crossers. While federally recognized tribes in the borderlands are included in environmental overviews, they are likely only the tip of iceberg of the indigenous population in the region. Even federally recognized tribes are barely included: The recent, and excellent, report, *The State of the Rio Grande and the Environment of the Border Region* by the Texas Natural Resources Conservation Commission (now the Texas Commission on Environmental Quality) only mentions in passing the Kickapu and the Tigua of El Paso, and no specific analysis is provided pertinent to indigenous groups (www.tnrcc.state.tx.us/admin/topdoc/sfr/o35_02). Their issues are subsumed to those common to all border inhabitants. Even so, the Kickapu are directly impacted by emissions from the Carbón I and II power plants in Coahuila, and their binational residence in both Eagle Pass, Texas, and Piedras Negras and Muzquiz, Coahuila, position them uniquely in the plume from these point-sources of air pollution.

Contrasting World Views

Along with a lack of real knowledge of the demographics of tribal people in the borderlands is an enormous rift in world view and governance. Native people, even in corporate groups, do not envision the landscape and the environment in comparable terms to the dominant culture. While many tribal nations have been disembedded from their traditional landscapes and sacred territories, some still practice traditional culture within the fragments of what is left to them. The Tigua of Ysleta del Sur Pueblo in El Paso make pilgrimages to rock art sites and sacred landscapes in the Hueco Mountains and Alamo Mountain. They are directly impacted by federal proposals to develop the Otero Mesa for oil and gas production, and have opposed this as destructive to their traditional sacred landscape. The tribe has witnessed the erosion of rock art at the Hueco Tanks State Park while under the stewardship of Texas Parks and Wildlife, and have registered their concern with the agency. Ironically, their use of a symbol from one

of the panels for the icon of their gambling casino has been criticized by an agency solicited report as disingenuous and “commercial.”

While tribal nations in the United States do not still endure tattooing of identification numbers and other humiliations, there are still relicts of the 19th century racism that removed them from their traditional homelands. Chronic unemployment and high poverty rates resulting from their compartmentalization into circumscribed reservations are indicative of this continuing neglect and disenfranchisement. State and federal governments must do more than simply list the few tribal groups that are known to be inclusive of tribal needs and problems.

Another aspect of the divide between the indigenous world and the open world of state and federal government is the disparity between styles of discourse and decision-making. Federal agencies are impatient with tribal consensus process, which is often closed and sometimes non-compliant. They mistake this for diffidence or deception. In contrast, the blunt and linear approach of government is often not compatible with native vision or governance. The engagement of subaltern people through the environmental justice programs of the U.S. Environmental Protection Agency (EPA) is an exemplary effort, but still has not recognized this fundamental difference that impedes communication, recognition of environmental problems, and appropriate avenues for remediation. The EPA has been successful in establishing environmental offices at several recognized tribes, and capacity-building in the form of GIS environmental assessments, wind-energy evaluation, and tribal environmental education have been positive points of collaboration.

ENVIRONMENTAL ISSUES

Population

The explosion of the border population is primarily in urban areas and can be attributed to migration to jobs in low-wage assembly plants and the service sector. Urban infrastructure in both U.S. and Mexican cities is severely strained by the increase, disproportionately so in Mexican border cities. Ciudad Juárez, for example, has more than 1.2 million inhabitants, but its annual municipal budget is less than that for the University of Texas at El Paso, which has only 17,000 students. Indigenous communities in Ciudad Juárez are comprised of Tarahumara and Mixtec, with individuals thought to have migrated from many, if not most, of the ethnic indigenous groups in southern and central Mexico. Without demographic data, it is not possible to address the issue of urban tribal needs, except to say that at least they share the problems endemic to the region. However, unique and adaptive migration strategies no doubt are facilitated by corporate and informal communities and communication among diverse ethnic groups. Ethnographic studies are essential to provide insight into these patterns, problems, and adaptive strategies.

Urban/Rural Ethnoscapes

Rural landscapes in the borderlands have been fragmented by compartmentalization, resource extraction, dumping, and desertification. Tribal

access to resources have been severely impacted in rural areas, and traditional and sacred landscapes have been degraded and desacralized. Indigenous world views integrate traditional knowledge, resource procurement, ritual practice, and cosmology. The sustainability of traditional cultural practice is in danger from the erosion of rural landscapes and by migration to urban areas where tribal nations are disembedded from traditional community and terrain.

Land Tenure

The reservation and land grant appropriations in the United States and Mexico were generally *ad hoc* political subdivisions of marginal territories that compartmentalized and constrained tribal nations from traditional agricultural, grazing, or hunting and gathering practices. Most tribal entities have not been able to sustain economic security or development within these limited territories. Their fragmented homelands have led many to migrate for low-wage opportunities to urban areas. Within the reservations or grants, unemployment is often chronic and endemic, with 67% of Tohono O'odham in Arizona and 54% of Quechan people in California unemployed in 1997 (www.us-mex.org/borderlines/1999/bl62/bl62oview.html). Traditional tribal territories provided for flexible and extensive land use strategies that cannot be accommodated within the narrow confines of adjudicated reservation lands, and adaption of U.S. farming and ranching strategies have mostly contributed to further degradation.

Water Rights

The needs and rights of indigenous groups have historically not been included in large-scale water development projects or protected by the principle of first-use in western water law. Upstream projects have often curtailed or degraded water supply, and aquifers have been extracted and degraded in areas of indigenous habitation. Indigenous groups lack access to legal representation to protect their rights and water supply. Inappropriate land use practices encouraged by the dominant culture have contributed to degradation of watersheds and water supplies.

Water Quality

Contamination of water by hazardous wastes from illegal dumping and agricultural pesticides is endemic in most indigenous lands. "The Torres-Martinez Desert Cahuilla Indians have traditionally lived in the area surrounding the Salton Sea in California. In the past, they adapted to cyclical flooding and drying, fishing when the basin filled, and cultivating crops when the water receded. Today, the sea never recedes; it is continually replenished by a constant flow of pesticide-contaminated runoff from the nearby Imperial and Mexicali valleys, as well as by municipal and industrial effluent from Mexicali." Those tribal nations reliant on water from riverine sources are subject to supply constraints and degradation of water quality from the waste stream of upstream users. The Kickapoo, for example, in Eagle Pass, Texas, complain of sickness and eye irritation from Rio Grande water supplying their community (www.us-mex.org/borderlines/1999/bl62/bl62oview.html).

Water Quantity

Depleted aquifers and limited water supplies are common to all inhabitants of the region, but tribal nations have little representation to establish adequate allocations or to protect diminishing resources on their lands. The Tigua of Ysleta del Sur Pueblo have filed land and water claims pertinent to their original land grant in Ysleta, Texas, which was appropriated from them in the 1870s. However, no legal resolution of this land claim appears imminent.

Air Quality

Air quality suffers in areas tribal nations in Eagle Pass, Texas, and Muzquiz, Coahuila, from the Carbón I and II power plants; the Tigua of Ysleta del Sur Pueblo in El Paso, Texas, reside in the most polluted airshed in Texas, largely from PM₁₀ from point- and non-point source pollution; tribes in Southern California complain of declining air quality from industry in nearby Mexican cities.

Hazardous Waste

There is no compiled data on hazardous waste or toxic substances impacting lands of tribal nations. However, they participate in the general borderlands problems of industrial, agricultural, landfill and illegal smuggling, and dumping endemic to the region.

NATIVE TRIBES OF MEXICO'S BORDER REGION

The four native indigenous groups with a permanent land base living within 100 kilometers of the border (followed here by their U.S. nomenclature) are the Kikapu (Kickapoo), Papago (Tohono O'odham), Cucapá (Cocopah) and Kumiai (Kumeyaay). All of these groups are directly related to tribal groups in the United States, some continuing to inhabit ancestral territory that was divided by the U.S.-Mexican border and others having been separated from their U.S. counterparts as a result of migrations and other historic processes subsequent to European contact. These groups are primarily rural with communal land holdings, and in many cases, tribal members migrate seasonally or permanently to nearby towns. Often those who remain on communal lands retain indigenous knowledge of traditional environmental management (including hunting, gathering and fishing strategies) increasing their possibilities for survival as they adapt to challenging economic, environmental, social, and political changes.

Kikapu

The Kikapu of Coahuila are part of an Algonquin speaking tribe of northern origin that also lives in Oklahoma, Kansas, and Texas (Hays 1996a). The Mexican Kikapu live primarily around the town of El Nacimiento de los Kikapúes, located in the municipality of Melchor Múzquiz, Coahuila. According to the INI (2003) and the National Council on Population (Consejo Nacional de Población CONAPO), there were 339 Kikapu speakers in 1995 and only 138 in 2000 (this may reflect migration patterns when each census was taken; also many tribal members may not be speakers). They live on approximately 7,022 hectares of *ejido* land, of which 6,500 hectares are used for cattle grazing and 500 hectares for the cultivation of wheat,

oats, corn barley, beans, and squash. Water for drinking and other domestic uses as well as irrigation comes from the springs of the Sabinas River; drinking water is brought directly from the source while the rest of the water is channeled into a canal that flanks the community.

Hunting has long been an important economic and ritual activity for the Kikapu; wild nuts and chilies (collected from communally owned wild groves) are also important natural resources that are gathered for sale. Firewood is the main source of fuel, although currently, natural gas is also brought in tanks from nearby towns. Some families use gasoline-fueled generators or oil lamps (Embriz Osorio 2003). Since 1832 the Kikapu have enjoyed the right to pass freely across the border and although they have had to defend their border crossing rights, they are probably less impacted by the border than any of the other border tribes (Hays 1996a). Telephone, telegraph, mail, and health services are not available in the community; for these the Kikapu must go to the county seat.

Papago

The Papago (known as Tohono O'odham and Hia'ched O'odham in Arizona) have traditionally been agriculturalists. For centuries they have raised beans, corn, teparies, and other plants adapted to the arid desert of northern Sonora and southern Arizona. During the dry season (winter) they focus on hunting and gathering; even today the hunting of deer and gathering of saguaro fruit and other wild foods has both economic and ceremonial importance for the Papago. Their traditional territory was bisected as a result of the Treaty of Guadalupe Hidalgo and the Gadsden Purchase of 1853. Today, approximately 1,500 tribal members (Talisman 2001) live in a number of villages and towns of Sonora. According to the INI socioeconomic database (2003), there were 142 speakers in 2000. Unlike their northern counterparts who live on the second largest reservation in the United States, the Mexican Papago have lost most of their traditional land base to mestizo ranchers and farmers, retaining less than 1,800 acres (Hays, 1996a). Many Papago have migrated to nearby towns and cities in search of jobs.

According to the National Indian Institute, in Papago, villages' "infrastructure and public services are practically non-existent except in Quitovac where electricity is by produced by a small generator. Water is insufficient; it is extracted from hand-dug wells that often show a high level of salinity. The nearest telegraph, telephone and mail services are in Sonoyta, Caborca and Puerto Peñasco" (Ortiz Garay and Saldaña Fernández 2003).

Cucapá

The Cucapá have long lived in the fertile delta region of the Colorado river and surrounding desert areas, practicing both flood-plain agriculture, hunting, gathering, and fishing. Closely related to the Kumiai and other Yuman speaking groups of Baja California and Arizona, the Cucapá today live in the settlement of El Mayor Cucapá some 56 kilometers south of Mexicali and in Pozas de Arvizu and San Luis, Rio Colorado, Sonora while their Cocopah relatives live primarily in

Somerton, Arizona (Wilken 2002). INI census data (2003) indicates that in 2000 there were 178 Cucapá speakers in Mexico.

Over the last century, the Cucapá have been drastically affected by the many changes in the upstream uses of the Colorado River's water; these have resulted in floods, drought, salinity, or contamination. The Cucapá land base is the most extensive of all the indigenous communities of Baja California at 143,000 hectares. However, much of it is parched desert without potential for agricultural or livestock activities. A large part of this land is the usually dry bed of the *Laguna Salada*, which has been greatly affected by fluctuations in the quantity and quality of water flowing in from the of the Colorado River. In years when sufficient water is released upstream, the lake fills and the Cucapá are able to practice traditional fishing activities. However, contaminants either from the river itself or from toxic waste dumped within the watershed have affected the fish, and caused stagnation when fresh water no longer flows in to the lake, all of which on occasions have caused huge numbers of fish to die. Some illegal dumping of toxic materials in the lake watershed has been reported by tribal members (Wilken 2001).

El Mayor does have basic water and electric services, however water quantity and quality are serious concerns. Economic activities include fishing, handcraft production (primarily beadwork, bark skirts, and other traditional arts), wage labor in neighboring communities, tourist services, and exploitation of natural resources such as sand and stone (Wilken 2001).

Kumiai

Traditional Kumiai territory originally extended from around Escondido in California to south of Santo Tomas in Baja California. Kumiai were hunters, gatherers, and fishers who managed a variety of coastal, inland valley, and mountain ecosystems. Like the Papago, the Kumiai of Alta and Baja California saw their lands divided into separate countries after the Treaty of Guadalupe Hidalgo.

Today Mexico's Kumiai live primarily in four rural communities: Juntas de Nejí, San Jose de la Zorra, San Antonio Necua, and La Huerta, with a total land base of more than 38,500 hectares and a total population of approximately 600 (Wilken et al 1998). Several unrecognized traditional Kumeyaay settlements also exist: Peña Blanca, Aguaje de la Tuna, and San Jose Tecate. INI census data indicates that in 2000 there were 243 Kumiai speakers in Mexico. The Kumiai have developed diversified economies that include cattle ranching, agriculture, handcraft production, seasonal wage labor, and natural resource use. Although Mexico's Kumiai are economically disadvantaged when compared with their U.S. relatives the Kumeyaay, they are rich in terms of traditional knowledge and are often invited to teach basketry, language, plant uses, and other traditional arts to Kumeyaay students in the United States. Technically, this traditional technology transfer is currently illegal since the Mexican Kumiai do not have green cards.

A study of water quality in the Kumiai communities found that most drinking water came from untreated surface water. Those wells that exist are usually hand-dug

and unsealed. Water is often stored in buckets or drums in homes. (CUNA/CEPA 1996). In San Antonio Necua, a public health study (Coates Hedburg 1999) and a medical anthropological study (Fleuriet 2002) both examined environmental factors in illness among the local population. Rivera Medina conducted a thesis that examined traditional uses of natural resources.

Only one of the four Kumiai communities has electrical service. None have telephone, telegraph, or mail service. Health facilities exist in three of the four communities; government (ISSESALUD) and volunteer doctors make occasional visits.

BORDER NATIVE INDIGENOUS GROUPS: CLUSTERS AND INDICATORS

Tribal Governance and Representation in Regional Research, Planning, and Policy

Although they are too often overlooked or ignored by federal, state, and local governments, all border tribes have their own governments that may include both traditional and elected authorities. The former have evolved to meet the changing leadership needs of tribes over hundreds or thousands of years; the latter (*comisarios* or elected chiefs) are often an interface between tribes and non-Indian governments (Magaña and Ceseña 1997). Most tribes hold regular community *asambleas* or meetings to discuss issues and make decisions. Like all political systems, these mechanisms are not without their problems (some tribes may have two opposing groups with two separate governments), however they are critical points of articulation between tribes, their authorities, and municipal, state, and federal governments. All too often governments and institutions disregard these mechanisms or give undue authority to self-appointed “representatives.” True representatives should be designated by their communities through a town meeting or by designation of an elected chief or traditional authority and with the knowledge of the community.

Appropriate indigenous representation in regional research, planning, and policy development is itself a significant indicator of community involvement, however this elusive goal is rarely met, as there are special circumstances that need to be considered to facilitate tribal participation. Time must be allotted for meeting with the tribe, providing clear information, allowing for internal decision-making processes to take place, and ensuring follow-up. If tribal representation is requested, the time and expense that representation implies should be considered. Since few tribes have telephone or mail service, communication is slower and more costly, usually implying several trips to and from communities. Tribal funds for travel, communications, computers, and other standard operating expenses of governments are often extremely limited or non-existent. Furthermore, most tribal authorities also work, so a day taken off to attend a meeting or participate in a planning workshop represents a day of lost wages. In spite of these challenges, fostering tribal participation has the potential to strengthen the effectiveness of regional planning and policy processes and to avoid many problems in the long term.

Historically, the Mexican federal government relationship with tribes has been based on the idea that all Mexican citizens share the same rights and therefore indigenous groups should not be treated differently. Unfortunately this policy has meant—among other things—that Mexican tribes have been glaringly unrepresented in the Border XXI process. This situation is said to be changing under the Border 2012 program.

Economy, Biodiversity and Sustainable Development

Due to the arid climate throughout the border region, most of the original native inhabitants developed hunting and gathering economies, except in those areas where rivers provided sufficient water for the development of irrigated agriculture. Traditional indigenous environmental management involved maintaining or encouraging flora and fauna beneficial to humans. Political and economic changes have led to the drastic reduction in tribal territories and, consequently, changes in land use, including the abandonment of traditional management practices over wide areas (Shipek, Wilken et al. 1998).

Because of demographic pressures since European contact, native groups have lost much of their original land base, especially valuable agricultural lands. Native groups have adapted to the regional pastoral cattle ranching economy that has allowed them to extract value from non-agricultural lands, however extensive cattle raising has a variety of impacts on wide areas, including the reduction of vegetative cover, accelerated soil erosion and the introduction of invasive species. Mexican government programs have often focused on agricultural projects that involve the total removal of vegetative cover and the establishment of irrigation systems; many of these projects have failed, leading to desertification. Some groups such as the Cucapá and the Papago, like other groups of the Southwest, have long cultivated plants adapted to the arid climate such as corn, beans, teparies, squash and gourds. In some cases hunting, gathering, and other traditional or innovative uses of natural resources continue as survival strategies in a diversified economic base. The case of the Papago illustrates this diverse adaptive strategy; economic activities include work in the mines and on non-Indian ranches, the sale of wood and handcrafts (basketry and pottery), small-scale commerce, and wage labor in the cotton fields (Ortiz Garay 2003).

Biodiversity values remain fairly high in many native communities. Invasive species (particularly related to cattle ranching and agricultural activities) have been little studied and in some cases (mustard, tamarisk, castor bean), may be perceived as useful by tribal members. In most native communities, natural living resources remain in a fairly good state of conservation due to the remote nature of areas and infrequent access to government programs and capital for economic development projects that result in large-scale changes in land use (Escoto 1999). Demographic pressures from outside and from within the communities represent the primary pressure on living resources. Encroachment on tribal lands always involves an interest in exploiting land, water, or living resources. Economic pressures from within communities may lead to overexploitation of resources (overgrazing, unmanaged firewood gathering, and fencepost cutting). Cattle ranching has had

the farthest-reaching impact in many communities, resulting in erosion, desertification of riparian areas, and some loss of vegetative cover when not carefully managed (Ahumada Cervantes 1999).

Traditional knowledge of the environment and its natural resources allows many indigenous groups to survive as well as to seek new options for living off the land (the harvesting of yucca, jojoba, sage, basketry plants). Handcraft production (often using natural resources), originally used for domestic purposes or traded with other groups, has been adapted to the modern cash economy (Wilken 1998; Rivera 2000). Hunting of bighorn sheep and deer was traditionally part of indigenous subsistence strategies; today, expensive permits are required favoring wealthy U.S. and Mexican citizens (with no benefit going to tribes); poachers also take an unknown amount of game, impacting faunal populations. The impact of undocumented worker migration and drug trafficking activities on the environment of the border region is little understood or documented.

Biosphere reserves often limit tribes' access to traditional utilization areas rather than involving the groups to provide them with new options for sustainable development. Hays (1996b) points out that "biosphere reserves and other mechanisms for protecting ecologically sensitive areas have proven to be barriers to indigenous access to traditional homelands, whether in Mexico or the United States. Federal efforts to shield such zones from environmental degradation have also effectively denied Native peoples the rights to collect traditional food and medicinal and ceremonial plants." In the northern Gulf of California, Cucapá fishermen charge that the biosphere reserve has drastically limited their ability to fish in traditional fishing areas (Franco 2003). Authorities, on the other hand, claim that some Cucapá engage in illegal business practices by simply selling their permits to commercial fishermen. Similar problems exist with the Papago (particularly the Hia'ched O'odham) and the Pinacates reserve (Hays 1996b). The Sonoran Desert Alliance is an NGO that has worked to "increase in indigenous participation in the planning and management of federally protected Native homelands" (Hays 1996b).

An approach that avoids these pitfalls is the creation of conservation "easements" with tribes in which sustainable development activities benefiting communities (ecotourism, sustainable harvesting of natural resources, research field stations employing tribal members) are supported in exchange for conservation and traditional management of tracts of tribal lands. Wetlands restoration and reforestation projects, particularly those focused on plants that can be used for sustainable development (e.g. yucca, basketry plants) have already been carried out on a small scale through collaborative efforts between tribes, non-governmental organizations (NGOs), and government programs and should be further explored. Ecotourism offers the opportunity to encourage conservation and stewardship of living resources and the landscapes, habitats, and ecosystems in which they occur, while providing benefits to communities.

Another important opportunity is the establishment of indigenous environmental management programs. Preliminary efforts in this direction have already been undertaken in Baja California where indigenous community members have been trained in the use of GPS, GIS, and basic environmental management techniques through collaborations between CUNA, SCERP, UABC, and the indigenous communities. Centers for indigenous environmental management have the potential to provide tribal members with the technology and technical expertise necessary to drive indigenous sustainable development initiatives in tribal lands.

Air

Indicator data on air emissions inventories/ambient monitoring, visibility measurements, cases of asthma as measured by hospital visits, and ambient air concentrations of select criteria air pollutants were not found for any of the border native groups. However, air quality appears to be excellent in most rural indigenous communities of Baja California; only the Cucapá community has been affected by the ever-expanding air pollution of the Mexicali/Imperial valleys. Good air quality is one of the valuable resources for ecotourism and conservation projects in native communities. Well-preserved, oxygen producing forests and vegetative cover provide a valuable environmental service to the greater regions.

Water Quantity and Quality

Data on measurable indicators of water quantity and quality are practically unavailable except in Baja California. Among rural native communities, agricultural use of water is generally limited to small scale, traditional agricultural practices adapted to arid conditions. Groups such as the Papago and Cucupá have lost access to most of their traditional lands and water for irrigation. Hays (1996a) also cites the example of the Kikapu in the 1940s: “protracted drought and excessive groundwater pumping by the American Smelting and Refining Company (ASARCO) left the Kickapoo unable to support themselves by traditional agriculture.” Today, the Kikapu irrigate with channeled water.

Rainfall and natural water production is of great concern to rural native communities, as changes in land use (cattle ranching and clearing of natural vegetative cover for intensive agriculture) lead to less rain. Desert tribes such as the Papago have also pointed to the lack of appropriate ceremonials as a factor in drought.

A successful example of a cross-border activity with the potential to increase water supply is the wetlands restoration project carried out by the Campo EPA, CUNA, and the Kumiai community of San Jose de la Zorra. A sediment retention structure—based on traditional methods of collecting water—works naturally to recharge the community’s aquifer.

For native groups often living in remote rural locations with small populations, the challenge is to motivate local governments to help develop appropriate infrastructure. Some of the opportunities for communities with low water supplies are traditional agriculture, sustainable use of natural resources based on traditional

knowledge (including the harvesting of medicinal and basketry plants) as well as ecotourism. Given many communities' remote locations, appropriate technology (solar, wind, gravity) is often cost-effective compared to the expense of connecting to distant municipal systems.

Water quality studies specific to native or migrant communities of the border region have not been carried out except in Baja California's Kumiai communities. Most communities depend more on surface water than groundwater since the cost of drilling and maintaining wells is prohibitively expensive. Aquifers may not have been tapped due to high cost of drilling and maintaining wells. Remote native communities tend to have fairly clean sources of surface or groundwater. Small improvements (well seals, backflow valves, chlorine bleach) can make a significant difference. Some communities don't perceive the need for purification because they are accustomed to local flora (Wilken, Connolly, and Magaña 1996).

In rural native communities water is administered by user groups. Existing infrastructure is often in poor shape due to difficulties in raising funds for repair and maintenance. Old PVC pipes that are broken or leaking are commonly seen wrapped in rags with water leaking out (Coates Hedburg 1999).

Among native groups, infrastructure varies from simple wells or surface water where people fill buckets and drums to community-wide water systems where water is available all day or periodically. Pressurized and purified water systems and community-wide wastewater systems are non-existent; generally gray water is discharged into garden and human waste is disposed of through outhouses.

Water infrastructure projects in Baja California have been promoted through the collaboration of CUNA and Aqualink, a U.S. NGO. The Border 2012 Program's focus on water quality and health (EPA 2002) represent potential opportunities to work with tribes in Mexico, driving further cross-border collaborations. U.S. tribes have also expressed interest in helping Mexican tribes with water systems.

Other Indicators

Quantitative data on solid, hazardous and toxic waste, health, emergency preparedness, public safety, transportation, quality of life, and other indicators are not available or would require an extensive interdisciplinary, intersectorial study to compile.

MIGRANT COMMUNITIES OF THE BORDER REGION

The number of migrant indigenous people along Mexico's northern border is often much greater than that of native populations. A case in point is Baja California, where an estimated 92.8% of the state's 37,000 Indians are migrants (INI, CONAPO, INEGI). It is well-known that a large part of the swelling population of the border is made up of migrant indigenous people primarily from central and southern Mexico, however specific statistics of migrant indigenous population and breakdowns by ethnolinguistic affiliation (much less environmental data) are not available. Although many ethnically homogeneous *colonias* exist in the border

regions, not all indigenous migrants settle in *colonias* with others of their same ethnic group, further complicating the effort to identify them. The demographic databases that exist provide more generalized information organized by state or language; furthermore, the criteria used by the INEGI, INI, and CONAPO to define indigenous speakers or tribal members differ so significantly that INEGI's national census found 8 million indigenous people in Mexico in 2000 while INI/CONAPO found more than 12 million.

Several academic institutions, including COLEF, state universities, COLMEX, and COLSON have been carrying out research on migration and tribal nations of the border region, however only a few, such as Velasco-Ortiz (2000, 2002) have focused on the combination of these factors.

Migrants often establish their residence in cities or agricultural settlements that are much more densely populated than their places of origin. Migrants' marginal economic status often push them into less desirable areas or margins of cities where they may end up in poorly constructed homes in irregular settlements without proper planning for basic services such as electricity or piped water. Often these settlements begin as "invasions" in high-risk areas such as canyons and slopes, eventually leading to problems with floods, landslides, or legal disputes. In most cases, urban migrant Indians face the same problems as other non-Indian, marginalized social groups (Pombo 2000). Indigenous migrants living in agricultural camps are exposed to pesticides and a variety of other toxic chemicals, as well as smoke and dust.

Some researchers believe ethnic identity may provide opportunities for community organization based on ethnicity. Many migrants maintain social and cultural ties with their places of origin, often sending significant percentages of their earnings back to their families and hometowns for traditional fiestas. Where monolingualism is a significant factor, environmental education materials may need to be developed in native languages.

CONCLUSIONS

This brief foray into the problem of border tribal nations should illustrate clearly that the biggest problem is the lack of data and inclusion of tribal nations in the process of discovery and sustainability. The gaps in knowledge are fundamental, ranging from the basic issue of inadequate demographic characterizations to different world view and styles of communication and problem-solving. A survey of the scant literature of tribal issues in the borderlands has been conducted with an eye toward developing a research strategy to address the issues identified here, and the authors have discussed their first-hand knowledge with tribes in Baja California (Wilken) and the Tigua of Ysleta del Sur Pueblo (Peterson). Their respective involvements with tribal nations has provided them a sense of what the future research agenda should entail and how it should be conducted.

First, adequate demographic modeling using ethnographic methodologies is critical to understanding who the tribal nations are and how they are adapting to

transnational limitations and opportunities. Tribal nations from throughout Mexico and the borderlands exhibit a tremendously resilient and flexible adaptive capability, which is subaltern and often in contradiction to transnational laws and boundaries. The few successful economic strategies such as Indian gaming facilities are more than counter-balanced by the historical degradation of Indian lands by inappropriate land-use strategies and expropriation of resources by the dominant culture. Ironically, even the successful casino enterprises of the Tigua and the Kickapu in Texas have been terminated by the State of Texas, leaving these tribes even fewer economic opportunities.

Second, engagement with tribal groups on an empathic basis is essential for understanding tribal concerns from within the context of their own traditional practice and world-view. There may be no direct correlation with the criteria and agendas of governmental agencies, as tribal members draw from a wealth of knowledge and cosmology largely unknown and sometimes diametrically opposed to those of the dominant culture.

Third, strategies for problem recognition and resolution must come from within the tribe and from an integration of tribal world-views with the issue-oriented focus of governmental agencies.

Finally, the maintenance and sustainability of tribal culture and practice depend integrally on the landscape, and any strategies for sustainability of the border environment need to incorporate landscape integrity, including viewsheds and open space as well as a concern for resources and contaminants or strategies for economic development. This could be a lesson for all in the effort to preserve and promote environmental quality in the borderlands.

REFERENCES

Ahumada Cervantes, R., et al. 1999. *Propuesta de manejo de ecosistemas de la Comunidad Indígena de Santa Catarina*. Maestría en Manejo de Ecosistemas de Zonas Áridas, Facultad De Ciencias, Universidad Autónoma de Baja California, Unidad Ensenada.

Ceseña, Javier. 2003. Conversation with author. Ensenada, Baja California (11 March).

Coates Hedburg, Kathleen Marie. 1999. Association of Gastrointestinal Illnesses and Environmental Factors in a Kumiai Indian Community in Baja California, Mexico." Masters Thesis, Graduate School of Public Health, San Diego State University, San Diego, California.

Embriz Osorio, Arnulfo. 2003. "Kikapu." Instituto Nacional Indigenista: Monografías (cited 5 March, 2003), <http://www.ini.gob.mx/monografias/kikapues.html>.

Environmental Protection Agency. 2002. *Border 2012: U.S.-Mexico Environmental Program*. EPA-160-D-02-001. Washington, D.C.: U.S. Government Printing Office.

Escoto, Martin. 1999?

Fleuriet, Katherine Jill. 2002. "An Anthropology in Health: the Relevance of Medical Anthropology to the Health and Health Care Needs of the Kumiai of San Antonio Necua and their Indigenous Relatives, Baja California, Mexico." Ph.D. diss., Department of Anthropological Sciences, Stanford University, Stanford, California.

Franco, Gerardo. 2003. Cocopa People's Fishing Rights Case to Go to Inter-American Court of Human Rights. *La Crónica* (Mexicali), February 28, 2003.

Hays, Rachel. 1996a. "Cross-Border Indigenous Nations: A History." *BorderLines* 20 (4): 1.

Hays, Rachel. 1996b. "Native Nations Pursue Sovereignty, Fair Trade, and a Clean Environment in the Borderlands." *BorderLines* 21 (4): 2.
INEGI: Indigenous statistics by state.

<http://www.inegi.gob.mx/difusion/espanol/poblacion/definitivos/bc/sintesis/lengua.pdf>

<http://www.inegi.gob.mx/difusion/espanol/poblacion/definitivos/son/sintesis/lengua.pdf>

<http://www.inegi.gob.mx/difusion/espanol/poblacion/definitivos/chih/sintesis/lengua.pdf>

<http://www.inegi.gob.mx/difusion/espanol/poblacion/definitivos/coah/sintesis/lengua.pdf>

<http://www.inegi.gob.mx/difusion/espanol/poblacion/definitivos/nl/sintesis/lengua.pdf>

<http://200.23.8.5/difusion/espanol/poblacion/definitivos/tamps/sintesis/lengua.pdf>

Instituto Nacional Indigenista (INI). 2003. "Datos Socio-economicos." (cited 4 March), <http://www.ini.gob.mx/>.

Kilpatrick, Alan, Michael Wilken and Michael Connolly. 1997. "Indian Groups of the California-Baja California Border Region and Border Environmental Issues." Southwest Center for Environmental Research and Policy project report. San Diego State University, California. Unpublished.

Liebman, A.K. 1996. Improving the quality of drinking water in colonias in the Ciudad Juarez-El Paso area. Southwest Center for Environmental Research and Policy, Border Environment Research Reports, No. 3. San Diego, CA.

Magaña and Ceseña. 1997

Ortiz Garay, Andrés and Ma. Cristina Saldaña Fernández. 2003. "Papagos/Tohono O'otham." Instituto Nacional Indigenista: Monografías (cited 5 March, 2003), <http://www.ini.gob.mx/monografias/papagos.html>.

Peach and Williams. 2000. *Population and Economic Dynamics on the U.S.-Mexican Border: Past, Present and Future*, en *The U.S.-Mexican Border Environment: a road map to a sustainable 2020*. edited by Ganster, SCERP Monograph Series, no. 1, SDSU, 2000.

Pombo. 2000

Rivera Medina, Erika. 2000. *Explotacion artesanal de especies vegetales en la comunidad indígena kumiai de San Jose de la Zorra, B.C. Mexico. Estado actual, perspectivas y alternativas de manejo*. Masters thesis in Arid Zone Ecosystems Management, Sciences Faculty, Universidad Autonoma de Baja California, Unidad Ensenada, Baja California, México.

Taliman, Valerie. 2001. "Borders and Native Peoples: Divided, But Not Conquered." *Native Americas* 18 (1): 10-16.

Velasco Ortiz, Dra. Laura. 2000. Pluralidad Étnica y Discriminación Social. http://www.tij.uia.mx/elbordo/vol07/pluralidad_etica4.html

Velasco Ortiz, M. Laura. 2002. *El regreso de la comunidad: migración indígena y agentes étnicos: Los mixtecos en la frontera México-Estados Unidos*, El Colegio de México, Centro de estudios Sociológicos: El Colegio de la Frontera Norte.

Wilken Robertson, Michael, Editor. 1996. *Water Quality in the Kumiai Communities of Baja California. Building a Kumeyaay environmental strategy: a Border XXI Project*. Ensenada, Baja California, México;The Native Cultures Institute (CUNA) and the Campo Environmental Protection Agency (CEPA).

Wilken, Michael et al. 1998. *Sustainable Development in the Indigenous Communities of Baja California*. Native Cultures Institute of Baja California (CUNA) and the Council for Environmental Cooperation (CEC), Ensenada, Baja California, Mexico.

Wilken Robertson, Michael. 2001. "Traditional Management and Contemporary Perspectives." *Proceedings from the First Binational Symposium Balances and Perspectives on Prehispanic and Hispanic Baja California*. Instituto Nacional de Antropología e Historia. 20-21 October, Mexicali, Baja California. CD Rom.