CULTURAL ECOLOGY AND THE INDIGENOUS LANDSCAPE OF THE TIJUANA RIVER WATERSHED

PROJECT NUMBER: NR-04-04

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NARRATIVE SUMMARY
For at least ten to twelve thousand years, native people have inhabited the Tijuana River Watershed, hunting and gathering the many resources that abound in the region and adapting to the changes in their environment over time. This project documents the relationship between the indigenous communities and the environment of the Tijuana River Watershed (TRW) within the larger context of ethnographic, ethnohistoric, and prehistoric cultural patterns. The information resulting from this project is useful for participating tribal communities, institutions serving tribal communities, and binational planning efforts.

The primary goal of this project was to synthesize available data from a variety of sources to form an overview of cultural resources in the Mexican portion of the TRW and to make this information accessible to indigenous community members, government agencies, planners, and researchers. The project has successfully integrated diverse datasets from archaeological, anthropological, and environmental sources and created a cultural overview of indigenous adaptation to the region.

The area's Kumiai communities have a wide variety of cultural resources, including milling stone and other prehistoric archaeological sites; cultural landscapes, ranches, trails, graveyards, and other historic sites; as well as large areas of well preserved land that have excellent potential for conservation and sustainable development, especially ecotourism. Traditional indigenous knowledge—including fluency in the Kumiai language, oral tradition and the knowledge of the land, its plants and animals—is an extremely rare and valuable resource still held by a small number of community members. The conservation of all these cultural resources currently hangs by a thread and will depend in large part on whether indigenous community members can derive direct benefits from these resources.

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INTRODUCTION

This project documents the relationship between the indigenous communities and the environment of the Tijuana River Watershed (TRW) within the larger context of ethnographic, ethnohistoric, and prehistoric cultural patterns. The information resulting from this project is useful for participating tribal communities, institutions serving tribal communities, and binational planning efforts. Through the collaboration of indigenous community members, San Diego State University (SDSU) anthropology professor Lynn Gamble, Native Cultures Institute (CUNA) Research Director Michael Wilken, la Universidad Autónoma de Baja California (UABC) geography professor Gerardo Chavez, Baja California Director of the Instituto Nacional de Antropología e Historia (INAH) Julia Bendímez, INAH archaeologist Oswaldo Cuadra, SDSU geography professor Richard Wright, and SDSU students Kara Johnson and Heather Kwiatkowski, as well as other students from the U.S. and Mexico, this project combined field work, bibliographic survey, and GIS lab work that has resulted in a document and GIS dataset describing indigenous cultural resources in the Mexican portion of the Tijuana River Watershed.

RESEARCH OBJECTIVES

The primary goal of this project was to synthesize available data from a variety of sources to form an overview of cultural resources in the Mexican portion of the TRW and to make this information accessible to indigenous community members, government agencies, planners, and researchers. The project research objectives sought to integrate diverse datasets from archaeological, anthropological, and environmental sources in order to generate this overview.

To better understand the relationship between prehistoric indigenous inhabitants and the environments of the TRW, the project participants reviewed archaeological studies and site records and compiled written and geospatial data to shed light on long-term patterns of human settlement in the watershed. Through a review of the historic and ethnographic literature, combined with field visits to surviving indigenous communities, the project participants produced an overview of regional indigenous history and

ethnography and its application to the understanding of indigenous cultural ecology in the context of the TRW.

Project team members and GIS specialists acquired the appropriate documents and carried out field work in order to map the indigenous communities of Peña Blanca, San José Tecate, Aguaje de la Tuna, Juntas de Nejí and salient cultural features such as rock art, cultural landscapes, and traditional gathering areas. The GIS specialists and archaeologists also worked with the cultural resource data generated from the project and the existing TRW environmental data to analyze possible relationships between indigenous inhabitants and their environments.

Through a series of field visits to indigenous communities, project team members documented indigenous traditional management of natural resources in the TRW and priorities for cultural and natural resource preservation. Finally, due to opportunities that developed in the course of the project, team members sought to establish mechanisms to promote binational collaboration in cultural and natural resource conservation.

RESEARCH METHODOLOGY/APPROACHES

The research methodologies included bibliographic review and synthesis; standard ethnographic interviews with key cultural consultants; transcription and editing of interviews with subsequent review by the interviewees; archaeological surveys (surface observation only) to corroborate information from archaeological, ethnographic, and contemporary indigenous data; documentation through photographs; acquisition and digitalization of existing maps related to tribal territories and the associated cultural and natural resources, and the integration of these into a GIS; and field collection of geospatial data including GPS coordinates to map areas or sites of cultural and environmental significance, traditional territory markers and Kumiai place names to be included in the GIS. Several texts were used in the field for reference and comparison; in particular Peveril Meigs' (1971, 1974) work which was researched in the 1930s and William Hohenthal's (2001) ethnography from the 1940s.

This project has been enriched by the deep commitment of the project team to tribal collaboration and empowerment. Tribal structures and protocols call for working through appropriate authorities and channels, as established in previous SCERP projects. Traditional authorities set priorities for cultural and natural resource preservation and provided input regarding traditional management of natural resources. UABC professor Gerardo Chavez worked closely with the project team, particularly Heather Kwiatkowski, to create an appropriate GIS that serves community needs and respects indigenous and INAH parameters regarding use of information.

Students from SDSU had the opportunity to participate in field surveys in Baja California under the supervision of the INAH. This involved day or weekend field trips to the various communities in the area of study. They had the rare opportunity to observe archaeological sites (no excavation was carried out) and discuss their significance with indigenous community members, the INAH archaeologist, and Dr. Gamble. During these trips, students and other team members photographed, georeferenced and

documented descriptions of the communities visited using standard anthropological field methodology. Due to the sensitivity surrounding the location of archaeological sites, not all of this material will be made public nor is it included in this report; decisions regarding the use of sensitive information were discussed by the team under the guidance of the Baja California Director of the INAH, the INAH archaeologist, the participating tribes, and Dr. Gamble.

Between June 1, 2004 and December 31, 2005, ten field visits were conducted in Baja California, many of which were two-day trips. On each visit, the team met with traditional authorities in the Kumiai communities and visited archaeological sites, abandoned historic buildings, traditional collecting areas, sacred areas, and other locales. The team visited five Kumiai communities in the TRW and met with nine traditional authorities (Table 1), most of them multiple times. During these field trips, interviews with the traditional authorities were tape-recorded and notes were taken. Over 1000 photographs were shot and more than 100 GPS points were recorded during the course of the project. All the photographs were organized digitally by communities and the GPS points were entered into a GIS database. Significant photographs, ethnographic notes, and observations of the archaeological findings for the GPS points were also integrated into this database.

PROBLEMS/ISSUES ENCOUNTERED

Several problems were encountered during the course of the project, most of which were logistical. Some involved changes in personnel because of unexpected circumstances. None of these problems prevented the team from achieving the goals that were proposed at the initiation of the project.

Julia Bendimez, the Baja California Director of the Instituto Nacional de Antropología e Historia (INAH), was not able to take as active a role as originally expected in the project. However, Bendimez delegated some of her responsibilities to the INAH archaeologist Oswaldo Cuadra and UABC geography professor Gerardo Chavez. This change strengthened the project by involving well-qualified researchers who provided needed skills and experience, while allowing Bendimez to continue to provide technical support.

Another problem encountered was the need to formalize the relationship between SDSU and the INAH. Cultural resource laws and regulations are significantly different in the United States and Mexico, so the United States project team members had to learn the details of working with INAH protocols. The issue of data access and protection became increasingly complicated; fortunately Bendimez and Gamble were able to achieve the establishment of a binational collaborative agreement.

Several issues relevant to the cultural resources in the project area are noteworthy. A number of the archaeological sites that were found, some for the first time, were recorded quickly, but not as thoroughly as the members hoped. This occurred in part because the field visits included traditional cultural authorities, some of whom were intheir eighties, and could not be expected to spend hours recording archaeological

sites. Other problems included access to sites. Some of the roads were impassable, and therefore, certain locales were either difficult to reach or were not visited, again in part because of the age of the cultural authorities. The heavy rains in the winter of 2004-05 also affected access to sites and delayed some of the planned trips.

As the project developed, the project team realized that more time was needed to complete the many different aspects of the work. It has also become clear that several more phases of the project are needed in order to thoroughly document the rich legacy of cultural and environmental interaction in the TRW.

RESEARCH FINDINGS

Indigenous Presence in the Prehistoric Period

For at least ten to twelve thousand years, native peoples have inhabited the TRW (Figure 1), hunting and gathering the many resources that abound in the region and adapting to the changes in their environment over time. The earliest inhabitants were probably Paleoindian peoples who arrived toward the end of the Pleistocene, hunting the now-extinct megafauna that roamed the area during the moister period at the end of the last ice age. These nomadic groups of big game hunters left only scant evidence of their presence, including stone tool assemblages and trails; however, Paleoindian sites are particularly important since they represent the earliest documented evidence of humans in the region. Several of these sites have been documented in the area north of the study area, and there is every reason to assume that they will be found south of the border as more archaeological reconnaissance and excavation work is carried out.

As the climate became more arid and the Pleistocene mammals retreated to the north or became extinct, native peoples adapted to the changes in their environment through greater use of plant materials. This is reflected in the types of stone tools found in sites of the Archaic period from around 8000—1,300 years before present, particularly grinding stones which show that milling of plant materials was increasingly important in native people's adaptive strategies. This way of life persisted for thousands of years, leaving evidence in the form of spear, dart, and atlatl points, leaf shaped knives, and milling stones (Gallegos et al. 1998; Rogers 1945).

Beginning around 1,300 years ago, changes in technology, as manifested in archaeological evidence, suggest that either demographic changes or the diffusion of new cultural complexes impacted native peoples of the wider region. Small projectile points and ceramics found at sites of the Late Prehistoric period suggest that the bow and arrow and pottery had been introduced from the eastern deserts. More intensive exploitation of the area's many resources, including oak and pinyon groves, probably led to increases in population. During this period, the pattern of material culture begins to resemble that of the Native American populations—most likely the ancestors of the Kumiai—who were present upon the arrival of European cultures to the area.

For pre-contact Kumiai people, the watershed probably represented an important axis between four directions. To the north, closely related bands or *shimuls,* with whom they shared a common language, linked them with the rest of native California. To the east,

related desert peoples, such as the Cocopah, were important trade partners who often joined the Kumiai for the pine nut harvest gatherings and who linked them to the vibrant agricultural cultures of the Colorado River region and the greater southwest. To the south were other Kumiai, Paipai, Ko'atl, Kiliwa and other peninsular groups with whom they also had frequent contact (including intermarriage). To the west, the watershed flowed into the Pacific Ocean with its abundant marine resources and milder winter temperatures. As Kumiai bands traveled from coast to mountains to desert, they moved through and beyond the boundaries of the watershed, probably choosing routes based on ease of access, relations with neighboring groups, and changing availability of resources.

As a result of this project, 24 archaeological sites were recorded, most of which had not be been officially registered with the INAH prior to the project. Most of these sites (approximately 16) had chipped stone artifacts on the surface. The chipped stone that was most prevalent was a dark green to black meta-volcanic that was available in the watershed. Milky quartz was also noted, but was not as common. Only three sites had aboriginal pottery, although possibly more sites had pottery, but as a result of the dense ground cover and the cursory nature of the surface reconnaissance, it was not observed. Eight of the sites had bedrock milling features that included mortars, slicks, basin metates, or "Cuyamaca ovals." The "Cuyamaca ovals" are oval-shaped bedrock milling features that are most commonly found in the Cuyamaca Mountain Range. The geographic extent of these features is of considerable interest to archaeologists; therefore, their presence in the TRW south of the international border is significant. Eight of the sites also had portable milling features including manos, metates, mortars, and pestles. Many of these were found in conjunction with the bedrock milling features. Eight sites had remains of structures, most of which appeared to have a historic component. Bone and shell remains were rare. One site had a bone ornament or tool that had been drilled and shaped. Another site had a fragment of abalone on the surface. One site had rock art present that consisted of anthropomorphic figures and abstract designs in black.

Approximately 15 of the sites that were documented in the Baja California side of the TRW appeared to have been used as habitation sites. This determination was made due to the presence of structural remains, milling features, pottery, and a wide range of lithic artifacts. Many of these sites probably date to the Late Prehistoric or early Historic periods. At least five of these sites, La Cienega, Ha'a, Las Calabazas, Manteca, and Peña Blanca, not only had a dense scatter of artifacts, a wide range of features and artifacts, but also encompassed an especially large area. These sites appear to have been significant habitation sites that may have been occupied year-round. Most of the non-habitation sites appear to have been special use areas, such as lithic scatters, or were used for ceremonial activities, such as the rock art site. All of the habitation sites are situated near water sources (streams and springs) and most have milling implements in association. Many of these sites lie in relatively pristine habitats that are still actively used by the Kumiai today for the hunting and gathering of medicinal, technological, and food resources. The locations and attributes of each site have been entered into a GIS that is only accessible to archaeologists.

Ethnohistory: Indigenous Presence in the 18th And 19th Centuries

The diaries of the 1769 expedition of Franciscans and Spanish soldiers as they moved to San Diego are the earliest written accounts of native peoples of the watershed. Fray Juan de Crespí's (2001) vivid descriptions of Kumiai people provide a rare view of indigenous lifeways before widespread contact with European cultures. Although the expedition spent only one or two days within the actual watershed boundaries, during several days of their route along the Pacific coast west of the TRW, they encountered Kumiai people whose territories included the watershed. On May 10th, 1769, at their camp in the area now known as Rosarito—due west of the watershed—Crespí described an encounter with local Kumiai people:

> *All of them came to the camp at once, men, women, and children, so that we could not count them all, every one of them well pleased, happy, and friendly, having their quivers, bows and arrows in their hands. Their chiefs on coming up to us gave us long speeches, and then, along with the nine men who had accompanied us from the previous spot, sat down with us. Men, women and children, all of them were very much painted in red, black, yellow, and white, all of the men being naked, wearing only feather headdresses, the women decently covered by bunched strings in front and either a deer or a sea lion hide in back. Some of the men carried the usual bow and arrows, others war clubs, still other very long fish gigs, these last being very sharp in the point, which is made of bone or shell. They all carry a great many very neatly and well-made fishing nets of all colors that they wear tied at their waists. Our commander made all of them a present of beads, ribbons, and other items, with which they were all very well pleased. Some of them presented barbequed sardines and mussels to the commander, who gave them very good presents, which they returned one more time by presenting him with one or two nets that they took from their waists and four or five arrows, from their quivers, that were very much painted and had very fine flints of all hues*….(Crespi 2001).

This passage brings to life many of the clues suggested by the archaeological record: the use of fiber cordage, clubs, bows, and arrows; the manufacturing of stone, bone and shell tools; hunting of terrestrial and marine mammals; fishing technology, including nets and spears; consumption of fish and shellfish; and traditions of trade and aesthetics. On May 14th, 1769, the expedition appears to have camped next to what would one day be called the Tijuana River (or a tributary), a lush environment in which native people had large settlements:

> *. . . we arrived close to a very populous heathen village, along one side of which there was a handsome stream running with a good-sized flow of water that with great force issues up out of the*

> *ground upon the spot, good fresh water. The stream flows at the foot of a range that we have borne upon our right hand during the whole day's march and that draws back for a bit over a league here, the country making a very great plain of very good soil with everything very grass-grown with green grasses. Immediately upon our arrival a vast quantity of heathens—men, women, and children in large numbers—came over both from this village as well as from other villages that seemingly are nearby, almost all of them of all sexes being very much painted in red, white and black, the men having on large feather headdresses and having their usual good—sized quivers upon their shoulders and bow and arrows in their hands. All of them are very sharp Indians, great bargainers. . . .* (Crespi 2001).

Unfortunately the nature of the encounters would change dramatically as the invading cultures with superior arms technology began the conquest of souls and lands. Historic evidence of Kumiai people's yearly cycle of travel from the mountains to the ocean—and the sudden disruption of this cycle—is found in a nineteenth century document quoting Janitin, a Kumiai from Nejí.

> *I and two of my relatives went down from the Sierra of Nejí to the beach of el Rosarito, to catch clams for eating and to carry to the sierra as we were accustomed to doing every year; we did no harm to anyone on the road, and on the beach we thought of nothing more than catching and drying clams in order to carry them to the village. While we doing this, we saw two men on horseback coming rapidly towards us; my relatives were immediately afraid and they fled with all speed, hiding themselves in a very dense willow grove which then existed in the canyon of the Rancho del Rosarito.*
>
> *As soon as I found myself alone, I also became afraid of these men and ran into the forest in order to join my companions, but already it was too late, because in a moment they overtook me and lassoed and dragged me for a long distance, wounding me much with the branches over which they dragged me, pulling me lassoed as I was with their horses running; after this they roped me with my arms behind and carried me off to the mission of San Miguel, making me travel almost at a run in order to keep up with their horses, and when I stopped a little to catch my wind, they whipped me with the lariats that they carried, making me understand by signs that I should hurry; after much traveling in*
>
> *this manner, they diminished the pace and lashed me in order that I would always travel at the pace of the horses* (Rojo 1972).

Clearly the Kumiai people who inhabited the study area were deeply impacted by the founding of the nearby Franciscan Mission of San Diego Alcalá (1769), and`the Dominican missions of San Miguel (1787) and Guadalupe (1834). Although the missions were established outside of the immediate study area, native people were soon drawn into their sphere of influence. Jatñil, a chief of the Nejí tribe, described to Clemente Rojo his changing relationship with the mission:

> *My name is Jatñil, and I have been the chief of this tribe since the year in which Lieutenant Ruiz left here for the South (1822); my father was chief before me, and before my father, my grandfather; so that the command of our tribe was always in the hands of my family, and that's why the tribe bears my own name. I came to help Father Felix raise Mission Guadalupe from its foundations to the end, and I also helped him to sow every year and to harvest his crops; and the father used to give us what he wanted to--corn, barley, and wheat, from that which we ourselves had sowed and harvested but, not content with this, he tried several times to have us baptized in order to shut us up in the mission and handle us like the rest of the Indians. This made me very angry and for that reason I went to look for him in Guadalupe with the intention of killing him. After that, I returned to this settlement [Nejí] and I haven't gone anywhere. Look, I can't even see from old age; most of my people died in the war; others got stirred up and went to Upper California at the time of the placer mines and haven't returned; so, you see, I only have a few families left and we all work without stealing from anyone* (Rojo 1972*).*

As the mission holdings were sold off or appropriated by non-Indians after the end of the mission period, the native people of the area were affected even more directly within their territory by the encroachment of ranchers such as Juan Bandini at Rancho Tecate. However, much of the area continued to be fairly remote, providing a refuge for non-christianized Indians and others who were displaced by demographic pressures from San Diego and other coastal areas. In 1848, the Kumiai/Kumeyaay cultural region and the natural habitats that comprised it were divided into two separate countries as a result of the Treaty of Guadalupe-Hidalgo. Nonetheless, limited contact continued between the groups on both sides of the border and some California Kumeyaay migrated to Kumiai settlements in Baja California as a safe haven from the persecution suffered in the United States. One example was made famous by anthropologist Florence Shipek (1991) in the autobiography of Delfina Cuero, a Kumeyaay woman from San Diego who at times lived at El Alamo or Ha'a, a remote canyon of Nejí.

By the late 19th century, most of the Kumiai people within the TRW lived on remote ranches and settlements, surviving through a combination of hunting and gathering activities, ranching, horticulture and wage labor, primarily as cowboys. Many eventually left their lands to work in Tecate, Tijuana, San Diego or other urban areas where most lost their identification with their Kumiai ancestry.

Ethnography: Indigenous Presence in the 20th Century

Kumiai (the phonetic spelling in the U.S. is *Kumeyaay*) people belong to the larger Yuman family of cultures and languages, which includes other groups from California, Baja California and Arizona (Hinton and Watahomigie 1984). Kumiai/Kumeyaay historic territory originally extended from near what is now Santo Tomas, Baja California up to Escondido in California and eastward over the mountains toward the Colorado River. The TRW is in the heartland of the southern part of this territory, where Kumiai people often refer to themselves as Tipai, meaning Indians or the people.

Archaeological, ethnohistoric, and ethnographic records describe Kumiai as highly mobile hunters and gatherers, exploiting a wide variety of resources in periodic cycles of movement from the coast to the mountains and desert. The TRW contains two of the most important resources in this seasonal round: oak and pinyon groves. Although detailed excavations have not been carried out, many archaeological sites have been identified in relation to these vital resources and some have been officially registered (Serrano González 2002). Many of these consist of bedrock milling stone sites in association with springs and seasonal campsites. In general, wherever important plant resources (particularly oaks) are found in association with sources of water and specific geologic formations such as granite outcroppings, there is a high possibility of finding archaeological sites. This significant link between cultural and natural resources suggests an important goal for future studies: land-use patterning analysis, which, with the aid of geographic information systems, can help predict where sites may be located and consequently which areas should be given priority for conservation. According to Gallegos (1998): “the goal of land-use patterning analysis is to: (1) identify patterns of past human use and occupation; (2) determine zones of greater or lesser activity by past human populations; (3) identify the environmental variables that form the most accurate prediction of cultural resource sites; and (4) discover the range of cultural resources variability within the [study area].”

For the Kumiai and neighboring groups such as the Paipai, the pinyon groves of the Sierra Juárez were an important shared resource that not only provided an important component of their diet but also represented a time of great social and ceremonial significance. Like many foraging groups, Kumiai band organization allowed for a highly adaptive flexibility in group size so that when resources were relatively scarce, groups could break into smaller units and spread out across the landscape. However, at times of abundance such as the pine nut harvest, many bands might gather in an area such as the Sierra pinyon groves for times of feasting, rituals and the seeking of mates. Historic documents (Rojo 1879) describe such gatherings when many groups met in the pine nut groves during late summer and carried out the *gran lloro* or *wakeruk*, a festival commemorating the dead. Even today, some Kumiai and Paipai still head up to the pinyon groves of the Sierra for the pine nut harvest in late summer (Wilken 1981). Not surprisingly, many rock art sites in or near the watershed are associated with the pinyon habitat or other areas where there are concentrations of natural resources (Serrano González 2002).

Twentieth century ethnographic accounts of Kumiai in the study area provide useful information about Kumiai culture and settlements. Peveril Meigs III carried out interviews in 1929 and 1936 that were not published until the 1970s. *Creation Myth and Other Recollections of the Nijí Mishkwish* (1971) includes examples of oral tradition, maps of settlements and place-names, and historical information regarding Jatñil. *Field Notes on the Sh'un and Jat'am, Manteca, Baja California* (1974) features interviews of Kumiai living in Cañón de Manteca, near present day Tanamá, and includes rare photographs of a potter with her pots, various Kumiai residents of the area, a bedrock mortar with brush shade, and an acorn granary.

William D. Hohenthal Jr.'s *Tipai Ethnographic Notes: a Baja California Indian Community at Mid-century* (2001) based on fieldwork from 1948, 1949 and 1951 is the most complete ethnographic work related to the study area. Hohenthal visited many of the indigenous settlements that would cease to exist or become m*estizados* by the end of the century, including Manteca, Los Coches, Tanamá, Las Calabazas, Jamatay, El Compadre, Jasai and Jacume as well as those that have survived through the present: Nejí, Peña Blanca, and San José Tecate. Valuable information is provided on a variety of subjects: local and regional history; prehistory and archaeological sites; tribes, clans and territories; Kumiai place names; native subsistence and lifeways, including specific information on wild plants gathered; and material culture, including basketry, pottery, cordage, milling implements, leatherworking and structures. In many cases, Hohenthal provided maps showing the layouts of traditional settlements. Information on social life, traditional games, clothing, adornments, law, government, religious beliefs, ceremonies, oral tradition, healing, and ethnoscience reflects both indigenous and Mexican lifeways, and may be useful in helping indigenous communities recreate or reconstruct aspects of their culture, especially for ecotourism/interpretive center projects.

Frederick Noble Hicks carried out fieldwork in northern Baja California and synthesized information on aboriginal subsistence and sociopolitical organization in his 1963 dissertation, *Ecological Aspects of Aboriginal Culture in the Western Yuman Area*. Although the work treats a much larger area than the TRW, his ecological approach, as well as the specific information on the Tipai (Kumiai), provides useful data for understanding human adaptation to the TRW environment.

The Kumiai Communities of the TRW Today

Today only a handful of Kumiai communities remain in the TRW (Figure 2). Only one, Juntas de Nejí, has title to its land, while several other traditional settlements—Peña Blanca, San José Tecate, and Aguaje de la Tuna—struggle to regain or retain their land against the encroachment of *ejidos* and other powerful interests. Many of the members of these communities live only part time in their communities, residing most of the time in Tecate, Tanamá, Valle de las Palmas, El Testerazo, or other neighboring towns where they find easier access to employment, schools and services. For all of these communities, census data is unavailable, incomplete, or questionable. Some traditional settlements, such as Cañón de Manteca and Las Calabazas, which still had indigenous inhabitants 50 years ago, are now abandoned.

Juntas de Nejí

The Kumiai community of Juntas de Nejí is the northernmost of the federally recognized indigenous communities of Baja California, located within the municipality of Tecate (Figure 2). Nejí is divided geographically into two separate polygons, both of which lie relatively close to the international border and within the Tijuana River Watershed and have a combined total of 11,590 hectares. The clans of Nejí have historically shared close familial and linguistic ties with the Kumeyaay (or Tipai) groups of southern San Diego County such as Campo, Manzanita, La Posta and Jamul.

The community's mountainous terrain includes wide areas of high chaparral, oak woodlands (Figure 3), granitic outcroppings, and in some areas, pines, Tecate cypress, and other flora indicative of the transition to the higher altitudes of the adjacent Sierra. A permanent stream connects the two polygons of Nejí; however, generally water sources are scarce, usually consisting of small springs or shallow wells. These are used for both drinking water and limited gravity-fed irrigation. The remote El Alamo (Ha'a) canyon of Juntas de Nejí is one of the few areas with a year round flowing stream, as well as important historic and prehistoric archaeological sites.

All of the settlements in the community are located far from the highway, accessible only by dirt roads in poor condition. However Mexico's Highway 3 Tecate—Ensenada does cross a small part of Nejí's land at one point and access by dirt road is also possible from the town of El Hongo off Highway 2.

Acorns are one of the most important natural resources utilized in the area of Nejí, and residents also depend on other wild foods and medicinal plants as well as occasional hunting as part of a diversified survival strategy. Although pottery and basketry traditions once existed in the area, there are currently only a few women occasionally producing baskets.

Four archaeological sites were documented under the supervision of the INAH in the eastern polygon of Nejí, and three more were observed just south of the polygon. Enriqueta Mata Meza, José Cuero, and his wife Andrea are still living at the Nejí Ranchería. Enriqueta (Figure 4) showed the project team numerous cultural resources and collecting areas in the region. She identified the adobe foundation of a home that used to belong to Paola Mata as well as old house remains that belonged to her father and grandfather. Bedrock milling features, chipped stone, and other artifacts were observed near these house sites. Enriqueta also identified the area where pottery was fired. In addition, she took the group to the source of clay that her mother used to make pots and displayed some of the pots still in her possession. The project team that worked with Enriqueta included Teodora Cuero, who spoke Kumiai with her as she did with the other cultural authorities that were consulted. When the team left the Nejí Ranchería, Enriqueta gave Teodora a bag of acorns still in their shells and another bag of processed acorn meal. The team noted that an abandoned automobile on the property was used to dry the acorns. This illustrates that although the Kumiai are using new technology, they are still eating staple foods such as acorns, which require considerable processing, including leaching, before they are edible.

According to Juan Adams, one of Hohenthal's (2001) Kumiai consultants from Nejí East, there were 30 to 40 Kumiai living there in 1878. They were living in round, earth-covered tule houses during the winter, which they then burned in the spring. At that time, according to Juan Adams, the Indians did not have rancherías and still did a lot of gathering and would travel to the desert during winter. They were also able to freely cross the border to visit relatives or move from place to place. Juan Adams also told Hohenthal (2001) that there used to be Indian dwellings all over Nejí valley, but that they usually were built on the hills. The creeks used to be larger and more numerous, and there were tule ponds. When Hohenthal visited the Nejí ranchería, it appeared to be about four hectares in size. It was said that Juan Mata used to have about four times that amount of land, but had sold some of it and let Mexicans encroach on the land. Juan Mata had about two hectares under cultivation with maize, watermelons, squash, beans, chiles, tomatoes, and tomatillos. He irrigated the fields by ditches that were connected to a spring. There were about ten people from many of the different local families living there when Hohenthal visited (Hohenthal 2001).

Las Calabazas (Figure 2), which is near the southern perimeter of Nejí East, is a settlement where Benita Meza, Aurora Meza's mother, lived. The settlement is near a drainage where a large oak grove and boulders with many bedrock milling features, including "Cuyamaca ovals," slicks, mortars, and basin metates, are situated (Figure 5). The remains of a house with numerous historic artifacts and a possible storage facility are across the creek. Also present at this site are a drainage ditch, dam, and other features. Scattered on the surface were flakes, cores, and grinding stones. According to Benita and Aurora, three or four families used to live at this site. Benita mentioned that she became an orphan when she was nine years old and that her uncles took care of her after that. Aurora lived at Las Calabazas until she was ten years old. When Hohenthal (2001) visited the settlement, Alejandro Calles and his niece, Carmela Machado were living there. There was one large house, a storehouse, a cookshed, and a small henhouse made out of guatamote and willow. About two acres were planted at the time with wheat, maize, pink beans, and squash. The plots were irrigated from ditches from a pool, which was fed by a ditch connected to the spring.

According to Hohenthal (2001), the vegetation consisted mainly of pod-bean mesquite and juniper, with a few cottonwoods and willows, but no oaks. When Hohenthal visited, there were two archaeological sites in the canyon area. Alejandro Calles had occupied one in 1929 where he lived in a house, which he later burned and abandoned after the death of his mother. There were four old adobe dwellings. Hohenthal noted numerous sherds, grinding implements, historic artifacts, and some abalone shell fragments, but very few chipped stone objects. Near the site, Hohenthal found several killed metates and mortars. One killed portable mortar, which had been broken in half, was placed in the wall of an adobe wall. According to Ricardo Calles, it had been picked up from the other site, because you could use things of the dead if they were not your relative's. The other archaeological site he investigated had no adobe ruins and was located on an isolated hill (Hohenthal 2001). The previous inhabitants had been a man named *Kwat'kunsapax* and his daughter. There were more lithic materials at this site.

According to Hohenthal, there is a rock art site in the Calabazas canyon area, but he did not have time to visit it. Hohenthal (2001) mapped the historic occupations at Las Calabazas.

The western polygon of Nejí includes the ranches of Rancho Encino Solo, Los Plateros, Los Coches, Ha'a/Alamo Canyon, and La Ciénega. Aurora Meza accompanied the group to the settlements in the area. Aurora still lives at Rancho Encino Solo for part of the year. Her family is part of the *Mishquish* clan. For some of the field trips in Nejí West, Aurora's mother, Benita Meza (Figure 6), also joined the group. Benita is fluent in Kumiai and speaks very little Spanish and no English. Seven archaeological sites were recorded in the western polygon of Nejí.

Aurora Meza accompanied the group to Los Plateros where nearby relatively shallow oval bedrock mortars, similar to the "Cuyamaca ovals" identified by archaeologists north of the border, were noted, as well as two springs and the remains of an old adobe house. Aurora told the group that the oval-shaped mortars were used to crack open acorns, and that the grinding was then done elsewhere. A small grove of *Quercus agrifolia* was near the mortars. Aurora explained that some large holes in the ground at the site were looters' holes. According to Aurora, the previous residents at Los Plateros included Rosa Mata, Julian Cuero, and a famous Kumiai Indian named Jatñil or Black Dog. One of Hohenthal's (2001) consultants, Juan Mata, lived at Los Plateros with his wife Loreta Calles.

The group also visited Los Coches, which is situated on the eastern boundary of the Nejí West polygon. Aurora noted that the Kumiai lived at Los Coches from October to December, where they collected manzanita and acorns and hunted deer. When Hohenthal (2001) conducted his research in Los Coches, Tomás Cuero, his wife Felicita, and some of their children and grandchildren lived there. Hohenthal mapped the settlement and noted that permanent houses were built on a hill, but during the summer of 1949, the family lived in temporary structures nearer to the crops and the creek, where it was cooler. Hohenthal (2001) noted that approximately an acre of land was planted at the site and that there were many manzanita shrubs whose fruits were eaten or crushed to make a drink.

The large archaeological site of Ha'a (Figure 7) was also visited, under the supervision of the INAH archaeologist Oswaldo Cuadra. Aurora Meza, who lived at the site when she was young with her mother, accompanied the team. The site was not accessible by vehicle, so instead the team walked to it. Ha'a is a very large village site with at least one spring. Ha'a is the Kumiai word for cottonwood, or *Álamo* in Spanish, an extensive grove of which is visible all along the riparian area. Numerous artifacts were observed on the surface, including pottery sherds, flakes, and groundstone. The only obsidian observed during the project was here; it looked like it was part of a biface. Aurora pointed out many of the house locations and mentioned who lived in some. One house was situated next to a large boulder that was used as a wall for the house. Aurora related a story about an old woman named *Kishmayaay* who lived in the house. She said that the old woman did not want to share her food, as was the custom, so used to

cook and eat inside her house, constantly peering out the hole in the boulder (Figure 8) to see if anyone was coming. Aurora showed the remains of her house and explained that houses were often built between rocks. One of the boulders at the site had a niche that had been carved in it, which Aurora said had been carved there because it was the chapel (Figure 9). Near the site of Ha'a was a large upright rock called the *Ui'ipá*, the Person-rock. Ha'a is mentioned in *Delfina Cuero* (Shipek 1991). Delfina Cuero's Kumeyaay grandparents left the San Diego area as they went farther and farther in search of food and a place to live, eventually settling at Ha'a. Delfina and her parents later joined them. Delfina married a man from Ha'a, Sebastian Osuna, and their children ended up living at the various communities in the area. The famous Indian leader Jatñil, known for organizing a rebellion against the Padre at Mission Guadalupe, was said to be from Ha'a. He had helped build the mission, but then became angry when people were forced into baptism. His grave is in Ha'a, where he was buried with a live black horse, to keep watch over people.

At Rancho La Ciénega, an abandoned house once lived in by Aurora and her mother, still stands. Aurora says it was abandoned because it was haunted. She told the group that some of the people who had lived there died of smallpox and were buried in the area with their heads facing west instead of facing east, the latter being the traditional way. Aurora's explanation was that the name *Mishquish* means rebellious, so the people were buried rebelliously. Aurora also said that metates were usually buried with women and manos were placed on the surface. An important trail that leads to a significant spiritual area is nearby. Near the ranch a number of artifacts were found, including a drilled and shaped bone implement that Aurora said would have belonged to the chief.

Hohenthal (2001) visited the Álamo area when José de Luz and his wife Luisa Mata were living there. The entire canyon is called Ha'a, but Hohenthal distinguishes between the Álamo ranchería where José and his wife were living, and the larger Álamo canyon as a whole. The road leading into the canyon used to continue on to La Ciénega, but was overgrown by the time Hohenthal visited. According to Hohenthal, the ranchería was situated at the base of a large rock face. There were ruins of two houses, one adobe and one stone, across the creek bed from the ranchería. These houses had belonged to Vincente Cuero, and were the site of the last long mourning ceremony held in the area; it was held for Vincente's mother, and took place in approximately 1890. José and Luisa's house was built of guatamote and willow with a roof made partly of wooden shingles and partly of flattened five-gallon cans, with an attached ramada. Luisa originally moved to Ha'a as the wife of José's half-brother Lorenzo Calles. When Lorenzo died, Luisa married José. In Hohenthal's opinion, José had some of the best fields, with about an acre and a half planted with corn, beans, squash, tomatoes, and chiles. Hohenthal (2001) also noted an orchard of about a dozen pomegranate, apricot, cherry, and pear trees, as well as grapevines. There were also many manzanita shrubs. José irrigated his fields by damming the creek and flooding them.

Peña Blanca

Bordering on the western polygon of Nejí is the traditional Kumiai settlement of Peña Blanca (Figure 2), an unofficial neighboring settlement to Nejí that is unrecognized by the Mexican government (Wilken 1998). Land tenancy is a serious issue for Nejí with its limited population base, and even more so for Peña Blanca, due to the lack of land tenancy documents. Both communities are undergoing invasion by squatters and encroachment by neighboring *ejidos*. One informant from Peña Blanca commented that members of a neighboring *ejido* interested in claiming the land for their own use have tried to destroy archaeological sites and any other cultural resources that might strengthen the Kumiai families' right to their land. The community is named after the mountain of Peña Blanca, which dominates the landscape (Figure 10). One of the most valuable resources for Nejí and Peña Blanca is the natural beauty of their landscapes and their sense of remoteness, even though they are actually surprisingly close to the metropolitan areas of Tijuana and San Diego.

Two archaeological sites were recorded in the area around Peña Blanca; more sites probably exist but not enough time was spent surveying the area. Josefina López Meza (Figure 11), who was born in the area and still maintains a house on the property, explained that about 100 people used to live in Peña Blanca, but there was no work, so eventually they moved to Tecate or Valle de las Palmas. Benito Meza registered the land in 1939. Numerous abandoned house foundations and bedrock milling features were observed at Peña Blanca. Josefina identified the remains of a structure that was her grandmother's home near some oaks, and the remains of her aunt's kitchen, which was made out of wood. Nearby she pointed out her great-grandmother's dwelling. Josefina said that each house had its own milling features outside of the kitchen. Many indigenous potsherds were noted, especially near Josefina's great-grandmother's house, as well as flakes and other artifacts. Josefina mentioned that there were also several other abandoned structures at the site. Josefina told about how her father used to dam up the creek near her grandmother's house to irrigate the land. Hohenthal (2001) visited Peña Blanca at the time that Benito Meza was living there. Benito had crops planted at both Peña Blanca and San Jose de Tecate.

San Jose Tecate

The community of San Jose Tecate (Figure 2) is several kilometers south of the U.S.-Mexican international border and just east of Tecate, immediately adjacent to Highway 2. Currently, Julia Meza Thing and her daughter Telma Meza (Figure 12) live on the property, which is much smaller than it was previously. A spring is near the houses, which are in a grove of oaks. A cemetery and rock art site are currently separated from the houses by the highway, and are apparently now on property that has been taken over by Pemex. The rock art panel is on a large face of the boulder that is not protected by an overhang. It consists of anthropomorphic beings and faded abstract designs in black. Chipped stone was observed near the rock art site. Julia's paternal grandparents, Antonio Meza and Petracuña, were the first in her family to come live at San Jose Tecate from Peña Blanca. Julia was born in one of the two houses on the property. She has many stories about her ancestors. Julia's grandmother, Petracuña, used to make large *ollas* and rode a horse across the border to trade her pots and baskets for food and other necessities (Figure 13). Eulalia, Julia's mother, could make baskets, and,

according to Julia, lived to be 120 years old. Julia also spoke of present-day water problems. There used to be water near the cemetery, she said, but they now only have one well with slightly salty water. Her “uncle” Ambrosio used to farm the lands around San Jose de Tecate. According to Julia, he planted prickly pear cactus, alfalfa, tomatoes, chiles, and fruits. His house was still in good shape until the government put in the present highway, which covered trees with mud and sand and disturbed the landscape. The government never responded to his complaints and Julia said that Ambrosio died of sadness after his lands were stolen. Julia also spoke about how many of the young people today are embarrassed of their heritage and only want to speak Spanish.

Julia has tremendous knowledge about folklore, plant uses, and local beliefs. She has numerous photographs of the communities visited for this project, and of people mentioned in the Hohenthal volume. The Indian name for San Jose Tecate is *Mat’ha’unal*, which Julia says means *tierra sumida* or sunken earth. In Hohenthal’s (2001) work, the community is called Villareal de San Jose. At that time, Julia’s father, Benito Mesa, had three hectares at Villareal. Benito also owned another two hectares at Peña Blanca, which Virginio Gonzalez took care of for him (Hohenthal 2001).

Aguaje de la Tuna

Aguaje de la Tuna (Figure 14) is a small traditional Kumiai settlement on the outskirts of Tecate (Figure 2) that has been deeply impacted by urban sprawl. The Kumiai here own 540 hectares; they used to own 1,065 hectares. The land has a spring, creeks, and stands of oak trees. Estefana Pérez Osuna (Figure 15) and some of her family are still living at Aguaje de la Tuna. Estefana says she was born here in 1930. According to Estefana, her father originally came to Tecate as a soldier from Chiapas. When she was younger, the family sold firewood and planted beans, corn, potatoes, and squash. They also owned a few cows and goats.

Estefana traveled all over the area when she was young, walking to other communities such as Manteca, and even went as far as Rancho San Diego, California to pick olives. Currently, Estefana and her son-in-law, Francisco Martinez, are concerned about their right to ownership of their land. The nearby city of Tecate is growing and people have been settling inside of their property to build homes. The water source here, or *aguaje,* is still strong, and people want to exploit the land and the groundwater supply. There are oak trees growing where the water is, and also right next to the house.

Four archaeological sites were observed at Aguaje de la Tuna. Several of these include abandoned house foundations, as well as bedrock milling features and flakes. Estefana’s parents used to live in an old house on top of a hill on the property. There was a mortar near the house that her mother used. Estefana said that the house was inhabited until 1949, at which time her father became ill and moved down the hill. Another abandoned house, made of adobe and bricks, was where Guadalupe Pérez Osuna lived. He did not have a family, and later moved down the hill. Aguaje de la Tuna is not mentioned in the Hohenthal volume.

Cañon de Manteca

Numerous Kumiai families used to live in Cañon de Manteca (Figure 2). Josefina López, who accompanied the project team to Manteca, identified the following families that lived in the canyon: Mishquish, Paipa, Cuero, Mata, Chum, Osuna, Meza, Cuaja, Tampo, Calles, and Cuijas. A site was recorded in the canyon that had hundreds of chipped stone artifacts, a hammerstone, a metate fragment, numerous potsherds, and bedrock milling features. A grove of oaks was in the vicinity. Most of the milling features were mortars, some of which were very deep. A small abalone shell was observed on the road. This site appeared to be a fairly large habitation site.

When Hohenthal visited Manteca Canyon, María Osuna, her daughter Rosa, and Rosa's husband, Fortino Valenzuela, and their child Enrique were living at the ranchería. The ranchería consisted of only four to five hectares, and abutted a Mexican ranch owned by Manuel Parra (Hohenthal 2001). According to Hohenthal, the land in Manteca canyon was planted in maize, pink beans, squash, watermelons, tomatoes, and chiles and also had an orchard and a vineyard. Heavy rains and flooding impacted the canyon in 1916. Prior to this event, tule ponds were reportedly in the canyon. According to Virginio González, one of Hohenthal's informants, the Kumiai had been living in Manteca canyon since the early 1800s. Hohenthal visited a spring called Agua Hechicera in the canyon, which means shaman's water. The spring's water is foul tasting and smelling, and makes sucking sounds as it emerges from the ground. Near the spring were bedrock mortars that were extremely deep. María Osuna told Hohenthal that people used to gather here for mourning ceremonies and other fiestas. Rosa Osuna also mentioned that the canyon had been covered with trees, but that these were cut down by Mexican charcoal burners, and this made the water more scarce (Hohenthal 2001).

Cuchumaa: Sacred Mountain

One of the most significant cultural heritage resources in the study area is Cuchumaa, also known as Tecate Peak. Cuchumaa has long been considered a sacred mountain for Kumiai/Kumeyaay people (Shipek 1985). The mountain, which is divided by the U.S.-Mexican international border, is the subject of native oral tradition and has numerous archaeological sites that have not yet been registered through the INAH. Cuchumaa represents an excellent opportunity to conserve land and preserve an important cultural heritage zone at the same time. In order to achieve this goal, it will be extremely important to include Kumiai and Kumeyaay people in the planning and implementation processes. A first step would be to bring together elders from both sides of the border to discuss their ideas about how the area should be managed. On the Mexican side of the mountain, systematic surveys should be carried out in order to register archaeological sites. Because the mountain itself transcends the international border, it could become a powerful symbol of the binational nature of the Kumiai/Kumeyaay nation.

CONCLUSIONS

Humans have been interacting with the various environments of the Tijuana River Watershed for over 10,000 years. During that time, indigenous peoples adapted to

major climate changes, developed a variety of subsistence strategies, learned about every aspect of the environment through empirical observations, and passed this information on to countless generations. The archaeological record can provide insight into this lengthy period of indigenous interaction with the environment, a period representing over 95% of the time that humans have inhabited the watershed. Historic records provide a vivid glimpse into the lifeways of native peoples during the critical period of transition between prehistoric and post-contact periods. Ethnographic records shed further light on traditional lifeways as well as native peoples' adaptations to the dramatic changes in the TRW during the last two centuries.

Several patterns become evident as a result of this study. During the vast majority of human habitation of the watershed, groups of highly mobile hunters, gatherers and fishers utilized the diverse ecosystems of the area, from the ocean to the mountains and the desert. Historic and ethnographic documents describe a constant reduction in the mobility of native peoples and degradation of the natural environments throughout this territory. In spite of this process, some aspects of the ancient relationship with the land and its natural resources are still preserved by a few Kumiai cultural authorities today—traditional knowledge of flora and fauna, indigenous place-names, concepts of living and historic landscapes, food and clay gathering and processing areas, and sacred sites. Strong genealogical and cultural ties exist between the communities of the Mexican TRW as well as with those of the US side, although these have become increasingly difficult to maintain due to historic processes leading to cultural disintegration and the imposition of an international border bisecting the Kumiai/Kumeyaay region.

Recommendations for Sustainable Management of Archaeological Resources
All archaeological sites in Mexico are under the care of the National Institute of Anthropology and History (Instituto Nacional de Antropología e Historia, INAH), a Mexican federal agency. Any work carried out that could impact Mexico's cultural patrimony must have the permission and in some cases the supervision of the Institute. This is more thoroughly explained in the document "Cultural Resources As A Tool For Conservation And Management" (Leyva, Aceves-Calderon, and Wilken 2002). Today the TRW, like the rest of Baja California, faces exponential population growth, mega-development schemes from tourism and industry as well as political, economic and social pressures to extract immediate value from any available resources, all of which inevitably impact the region's unique and vulnerable cultural and natural heritage.

Numerous sites in the TRW have been officially registered with the INAH. Many other sites exist in the region; however, until they are registered, it is difficult to officially protect them. Unfortunately the lack of resources and personnel to identify and register more sites in the area, the difficulties in enforcing cultural patrimony laws, the lack of a private cultural resource management sector and the economic pressure to develop unsustainably make it difficult to provide adequate protection for many sites (Serrano González 2001). Fortunately, one example of successful site conservation already exists in the area: Vallecitos. This archaeological site complex, which is just east of the TRW, is maintained by the INAH and provides appropriate protection, guided tours,

trails, restrooms and other basic infrastructure. Another interesting model is that of the Great Mural Art region of the Sierra de San Francisco, Baja California Sur, where tours to the rock art have had many direct benefits for the mountain communities who have themselves become stewards of the land and its cultural resources.

Archaeological sites exist within a natural context and add an intrinsic value to a habitat or ecosystem since they are non-renewable resources that provide a record of thousands of years of human history and interaction with the environment. Their presence should be one factor in identifying priorities for land conservation. However, these resources can also provide an added value to an environment when incorporated in strategies designed to involve local communities in conservation and sustainable development. Two important strategies are **appropriate site management** and **ecotourism**.

Long-term management of archaeological sites in an area—from exposed rock art and milling stone sites to middens and other unexposed sites—requires a long-term commitment to preservation, conservation, education, and close coordination with the INAH. When unexposed sites, such as middens, do not face immediate threats, they are often best preserved by simply protecting them undisturbed for future generations. This is especially important since excavation of a site involves the destruction of the site itself, thus a basic archaeological principal is to leave sites undisturbed when possible. However, when excavation is appropriate or necessary, this can provide long-term benefits for local community members who, through education, training, and employment in archaeological activities, can become promoters and stewards of site conservation. Currently the perceived value of artifacts for many rural communities is the hope of selling them for a few dollars to the unethical collectors who unfortunately create a market for these materials. However, as local people realize the much greater cultural, historic, and economic benefits that can be derived from the proper excavation and management of these resources, they will no longer be tempted to sell off their cultural heritage.

In order for this to work, land conservation strategies for community involvement should seek to create partnerships with local communities, the INAH, academic institutions and foundations, or government programs that can provide financing for systematic surveys and long-term archaeological site management projects within conservation areas. This is especially useful in indigenous communities, where tribal members may retain traditional knowledge that can provide valuable perspectives for understanding cultural history. In broader terms, research and monitoring projects of both natural and cultural resources that employ knowledgeable local community members will benefit from the experience of local experts while also providing visible benefits to the community in exchange. Fortunately the newly established Collaborative Agreement between SDSU and the INAH may facilitate many of these proposed activities.

The results of archaeological excavation should provide invaluable materials for interpretive centers that can serve as centerpieces for ecotourism projects in rural communities. A visitor center/museum with information on the natural and cultural

resources of an area is a first vital step in attracting and educating ecotourists on a regular basis. Archaeotourism—the participation of visitors in the excavation of a site—is a strategy that has worked in some areas, but would require the permission and supervision of the INAH.

Rock art and milling stone sites that do not require excavation are prime attractions for ecotours; however, an appropriate level of protection and management is crucial once these sites are opened up to the public. Fortunately, the above-mentioned models, including the required use of local guides, have already proven successful and can be replicated. Well-designed ecotours can promote natural resource and cultural heritage conservation while teaching local communities the benefits of stewardship.

Recommendations For Sustainable Indigenous Community Development

The area's Kumiai communities have a wide variety of cultural resources, including milling stone and other prehistoric archaeological sites; cultural landscapes, ranches, trails, graveyards, and other historic sites; as well as large areas of well preserved land that have excellent potential for conservation and sustainable development, especially ecotourism. Traditional indigenous knowledge—including fluency in the Kumiai language, mythology and the knowledge of the land, its plants and animals—is an extremely rare and valuable resource still held by a small number of community members (Wilken 2001). The conservation of all these cultural resources currently hangs by a thread and will depend in large part on whether indigenous community members can derive direct benefits from these resources. Nejí and Peña Blanca both possess large tracts of fairly well preserved habitat, which is communally owned by a fairly small number of *comuneros*. Tribal leaders have already expressed an interest in both ecotourism and land conservation.

One strategy would be to work closely with the communities to develop the area's ecotourism potential in exchange for conservation of significant areas of habitat. While this approach would require a long-term partnership with the communities, it represents an excellent opportunity for conservation as well as the possibility of helping to reestablish traditional Kumiai culture in the area. Well-designed ecotourism development, with employment for Kumiai cowboys and hiking guides with knowledge of the land; classes in traditional basketry, pottery, language, wild foods, medicines, games, and storytelling; and the establishment of interpretive centers with sales of handcrafts, food and herbal medicines, could all lead to tribal members returning to their land and re-valuing their culture.

Other sustainable uses of natural resources can include the harvest of wild foods (such as acorns), native herbs, as well as the propagation of native plant materials for sale to the public or for reforestation projects. The reintroduction of Kumiai juncus and willow basketry traditions would allow local Kumiai to sustainably use their basketry plants; the reintroduction of pottery making would provide a high added value to natural clays.

In order to successfully plan and carry out these projects, it will be crucial to have careful coordination with the indigenous communities and their tribal governments, and

to create broad binational partnerships between the indigenous communities, non-governmental organizations such as the CUNA, academic institutions such as the UABC, SDSU, Mexican federal agencies such as the Comisión Nacional para el Desarrollo de los Pueblos Indígenas (CDI) and the INAH as well as local stakeholders such as the La Puerta Foundation. Currently SDSU has a binational cooperative agreement with the INAH to share information on cultural resources on both sides of the border. SDSU plans to work with the INAH in helping them acquire the equipment and software to set up a GIS database of cultural resources. Once this is in place, the data collected for this project can be used more readily for the management of cultural resources in the TRW. This should also serve as a model for cultural resource management throughout Baja California and the rest of Mexico.

Summary of Recommendations

In summary, a number of steps need to be taken to develop strategies that are designed to involve local communities in conservation and sustainable development. Two important strategies that can benefit communities are appropriate site management and ecotourism.

It is important to work closely with the indigenous communities and their tribal governments, so that mutually beneficial arrangements are developed that will promote the conservation of both land and cultural heritage resources.

In order to carry out these recommendations, support is needed for the creation of broad binational partnerships between indigenous communities, non-governmental organizations such as the CUNA, Terra Peninsular, academic institutions such as the UABC and SDSU, Mexican federal agencies such as the CDI and the INAH, and local stakeholders such as the La Puerta Foundation.

RECOMMENDATIONS FOR FURTHER RESEARCH

In addition to some of the general recommendations suggested in this report, seven recommendations for future research are specified here:

1. Although numerous interviews were conducted for this project, additional interviews are recommended with the same individuals as well as cultural authorities that were not interviewed for this project. Many of the Kumiai have tremendous knowledge that is relevant to this research, but it was not possible to collect all this information during the course of the project. Many of the Kumiai with this knowledge are elderly and unless their oral traditions are documented, it may be lost. A number of younger Kumiai took an interest in the project and could serve as interviewers if they are given appropriate training in anthropological ethnography and equipment, such as cameras, tape recorders, and computers. It is recommended that more research be initiated where anthropologists work closely with the indigenous communities to further document the oral traditions and knowledge of the landscape.

2. A more thorough inventory of the archaeological sites in the TRW on both sides of the border is recommended. A systematic surface reconnaissance of the TRW south of

the border is the highest priority. This should be done in conjunction with the INAH archaeologists and GIS specialists. The results of the current project indicate that there are many sites in the region that have never been registered. The sites that were observed during the project need to be recorded in greater detail and mapped with the INAH overseeing the project and insuring that the records meet their standards and needs. It is also recommended that an inventory of sites, including their locations and detailed descriptions, be included for the TRW north of the border. Most of this information is available at the South Coastal Information Center (SCIC) at SDSU. The data on both side of the border should be entered into a GIS for the TRW. These data will have to be restricted according to the wishes of the INAH and SCIC.

3. Once the sites are officially registered with the INAH, a land-use patterning analysis needs to be implemented and documented with the help of GIS. Models can then be developed that can aid in the prediction of site locations and, consequently, which areas should be given priority for conservation.

4. It is recommended that anthropologists and the indigenous cultural authorities work more closely with biologists from Baja California to document the habitat associated with areas of cultural significance and its importance to the indigenous communities in the watershed.

5. A relationship with the INAH should be developed in order to identify common goals and additional possibilities for collaboration. The binational cooperative agreement between SDSU and the INAH that was signed in November 2005 is a good start, but interactions and communication need to be continued for the management and research of cultural resources in the TRW.

6. Genealogical data was collected as a result of this project, some of which was entered into a genealogical program. These data are significant in that they reflect the Kumiai ties to certain locations on the land, the marriage patterns and alliances, the antiquity of the families in the region, and other important anthropological information. Some of this information may be used for the museum exhibit planned at San José Tecate. Verification of genealogical information is needed, as well as additional interviews to expand on the existing data.

7. Anthropologists need to work more with the indigenous communities to further document their needs and advocate on their behalf.

RESEARCH BENEFITS

Benefits to the Community

The study resulting from this project directly benefits the participating indigenous communities in several ways. The GIS component literally “puts them on the map,” as the polygons and locations of the communities are included in the database of the TRW project and are also made available to the communities themselves, government agencies, and other local stakeholders. All of the communities have land tenancy

problems; the maps and the study document will be a powerful tool to help the communities strengthen their claim to the land.

A public document is being prepared and translated into Spanish to ensure that it will be of greatest benefit for the communities. Maps as well as historic and contemporary photographs will be included in the document. The community authorities have commented to the research team on many of the visits that they are interested in having the information from the study both for protecting their land and for preserving their culture and history.

The information will also be useful for the establishment of community museums. Currently a project is already underway in the community of San José Tecate to use the materials gathered to create a community museum. One of the graduate students who participated in the project from the Anthropology Department at SDSU is planning to complete a Master's thesis that will involve implementation of the museum.

The study helps communities ensure that their priorities and viewpoints are made known to government agencies, NGOs, and others interested in assisting them. For example, the communities' interest in conservation and sustainable development, and their significant land base with areas of well-preserved habitats, should prove attractive for organizations interested in promoting conservation.

Significance for Policy and Decision-making
Most of the baseline information included in the study has not previously been available to government agencies and other stakeholders involved in planning and policymaking. It has also not been available to the related indigenous communities north of the border who are often interested in understanding the situation of their relatives south of the border better in order to strengthen their ancient relationships and plan for greater binational collaboration. The study will fill that void by integrating a variety of types of data into one easily accessible document. This should lead to greater governmental assistance and cross-border collaboration. The data collected on archaeological and other cultural resources will also help the INAH manage and preserve these resources.

Significance of Research for Anthropologists
Very few indigenous societies such as those found in this portion of Baja California exist in the Californias today. The indigenous groups of southern Baja California are no longer intact. The Kumiai communities in northern Baja California that have survived live in remote regions and lack amenities such as running water and electricity. They have adapted to the harsh environment of the region and maintained many of their traditions. Even today the Kumiai are still supplementing their diet through hunting and gathering. Medicinal herbs remain an important source of cures for numerous ailments. The elders that hold this knowledge are still fluent in their language and know the customs that their grandparents practiced. A rare opportunity exists to document this knowledge and work with younger generations in its maintenance.

More is known about the cultural resources along the coast of Baja California than in the interior areas, with the exception of some of the outstanding rock art that is found in the interior. As a result of this imbalance, archaeologists' knowledge of past societies is limited. More data on the types of sites in the interior of Baja California, their chronological placement, and their role in the seasonal rounds of the Kumiai are needed to fully understand the past and the use of the environment. The initial data collected for this project serve as a basis for archaeological information of the interior of northern Baja California. It is clear from the knowledge gained on this project that the interior regions of the TRW were important to the prehistoric inhabitants, especially areas near water sources. Locations at greater distances from water were significant for hunting and collecting, and in some cases, had spiritual significance. This project has documented the importance of the region in understanding the prehistoric patterns of its inhabitants.

Several professional presentations and papers emerged from this project. Three presentations (one by Michael Wilken, another by Lynn Gamble, and a third by Oswaldo Cuadra) on the information that was collected for this project were presented at the annual INAH conference "Balance and Perspectives," a professional gathering of anthropologists and historians working in Baja California that was held in Tijuana, Baja California on November 10-13, 2005. In addition, Lynn Gamble gave a public presentation entitled "Cultural Landscapes of Northern Baja California: Past and Present" on the results of the project to the San Diego County Archaeological Society in September of 2005. Gamble and Wilken are scheduled to present another paper at the SCERP 2006 Annual Technical conference in San Diego in January 2006. Gamble and Wilken plan to submit a research paper on their findings to a professional journal in 2006, probably to the *Journal of California and Great Basin Anthropology*.

Education and Training of Students

The project provided excellent training opportunities for students on both sides of the border. Five graduate students from the Anthropology Department at SDSU participated in the project. They gained tremendous experience in GPS, GIS, ethnographic interviewing, photography, and writing, as well as invaluable experience working in an international setting. Most of them attended at least one of the INAH conferences that were held in 2005 and 2006. Two of the students are planning to complete Master's theses as a result of their participation in the project. One of these projects is to establish a community museum at San José Tecate and the other is to better document the cultural resources at Peña Blanca. Both projects should help the indigenous communities in their attempt to lay claims to the land and in the case of the museum, in providing an income while maintaining their traditional practices. The museum will include an ethnobotanical garden that has already been initiated by Julia Meza Thing and her daughter Telma Meza. In addition, Oswaldo Cuadra will be completing his undergraduate thesis in anthropology for the Escuela Nacional de Antropología e Historia.

In addition to the University students, local indigenous community members had the opportunity to participate in the process of carrying out research during the course of

the project. Their knowledge and experience was highly valued and they learned to work in a research setting. Perhaps the most vivid example of this was the experience of Enriqueta Mata Meza, who first told the research team that she did not know anything and did not know how to speak Spanish well enough to say anything of use to the project. Thanks to the intervention of Kumiai elder and speaker Teodora Cuero, and the support of the research team, Ms. Mata quickly overcame her shyness and spent the day working with the researchers, providing a large amount of invaluable information.

International Cooperation in the Border Region

This project should benefit international cooperation in the border region as a whole in several ways. The binational cooperative agreement should serve as a model between other universities and agencies working on border issues. Populations along the border continue to increase. Along with these increases, impacts to cultural resources will occur more frequently due to urban expansion and more development in rural areas. Management of cultural resources and their associated environment will become more urgent with burgeoning development. This project serves as a model on how academic institutions can cooperate with governmental institutions and indigenous communities in managing and protecting these resources.

This project also serves as a model in the promotion of sustainable development among Indian cultures living on the border. The indigenous communities living in border regions often live in poverty and are overlooked by government agencies. Many maintain traditional practices that can be sustained through ecotourism and other strategies. In this project, the indigenous populations were interviewed in part to determine their needs as well as to document their knowledge of the landscape; they all played an important role in setting priorities of this and future research. By working closely with the indigenous populations and addressing their requirements for sustainability of traditional lifeways, researchers can make more appropriate recommendations and act in a way that will be more satisfactory to the communities living on the border.

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APPENDIX

Table 1. Kumiai Cultural Authorities by Community

Kumiai Communities	Cultural Authorities
San José Tecate	Julia Meza Thing Telma Meza
Aguaje de la Tuna	Estefana Pérez
Nejí West	Benita Meza Aurora Meza Norma Meza Yolanda Meza
Nejí East	Enriqueta Mata Meza
Peña Blanca	Josefina López Meza

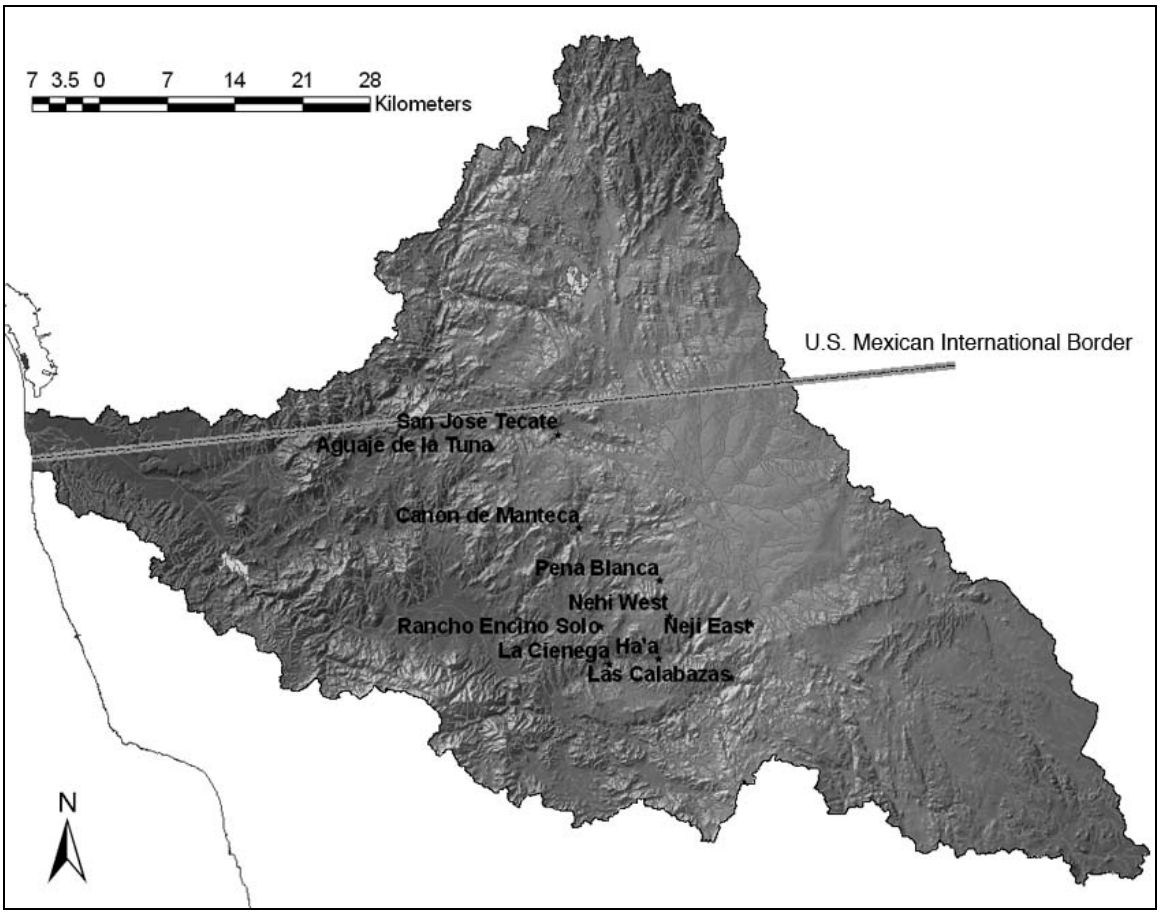

Figure 1. Tijuana River Watershed with Kumiai Communities in Baja California (SDSU Geography Department)

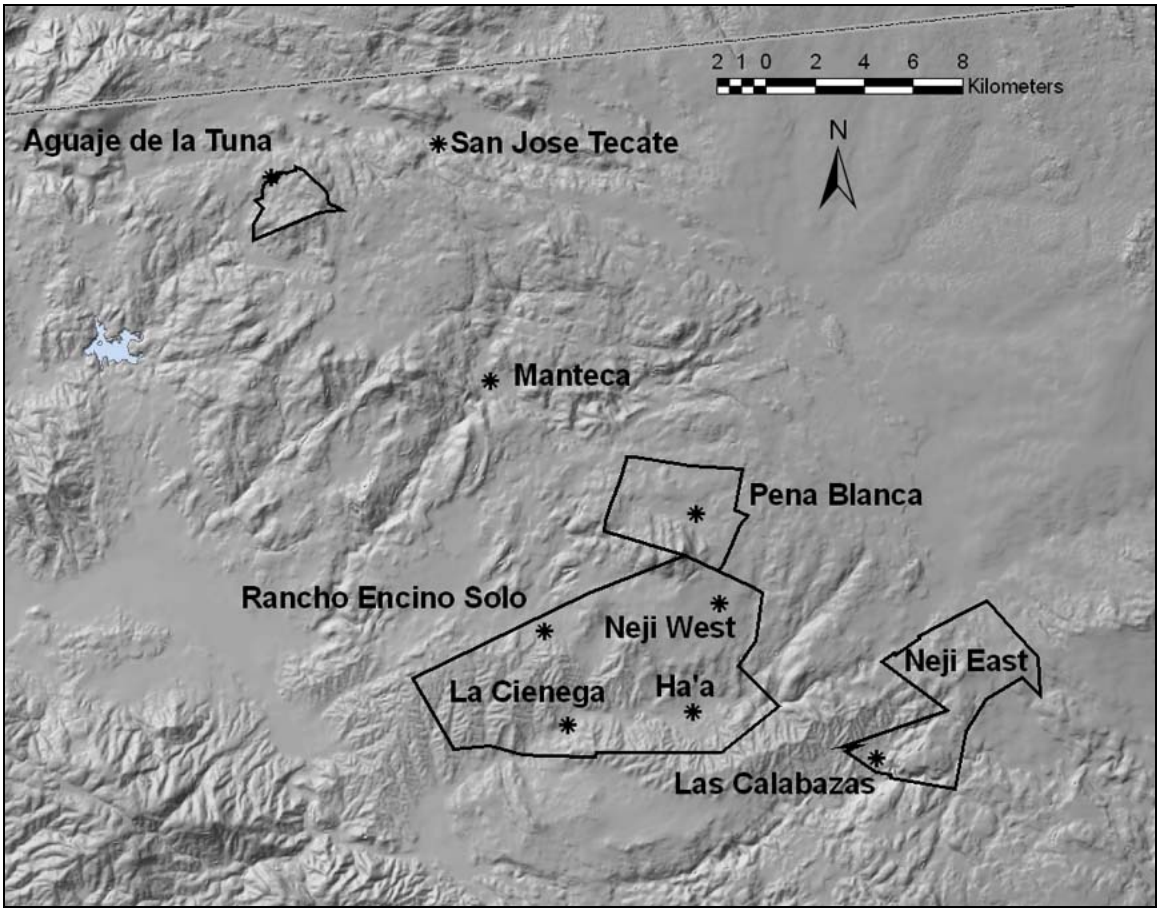

Figure 2. Kumiai Communities with Polygons in Baja California (SDSU Geography Department)

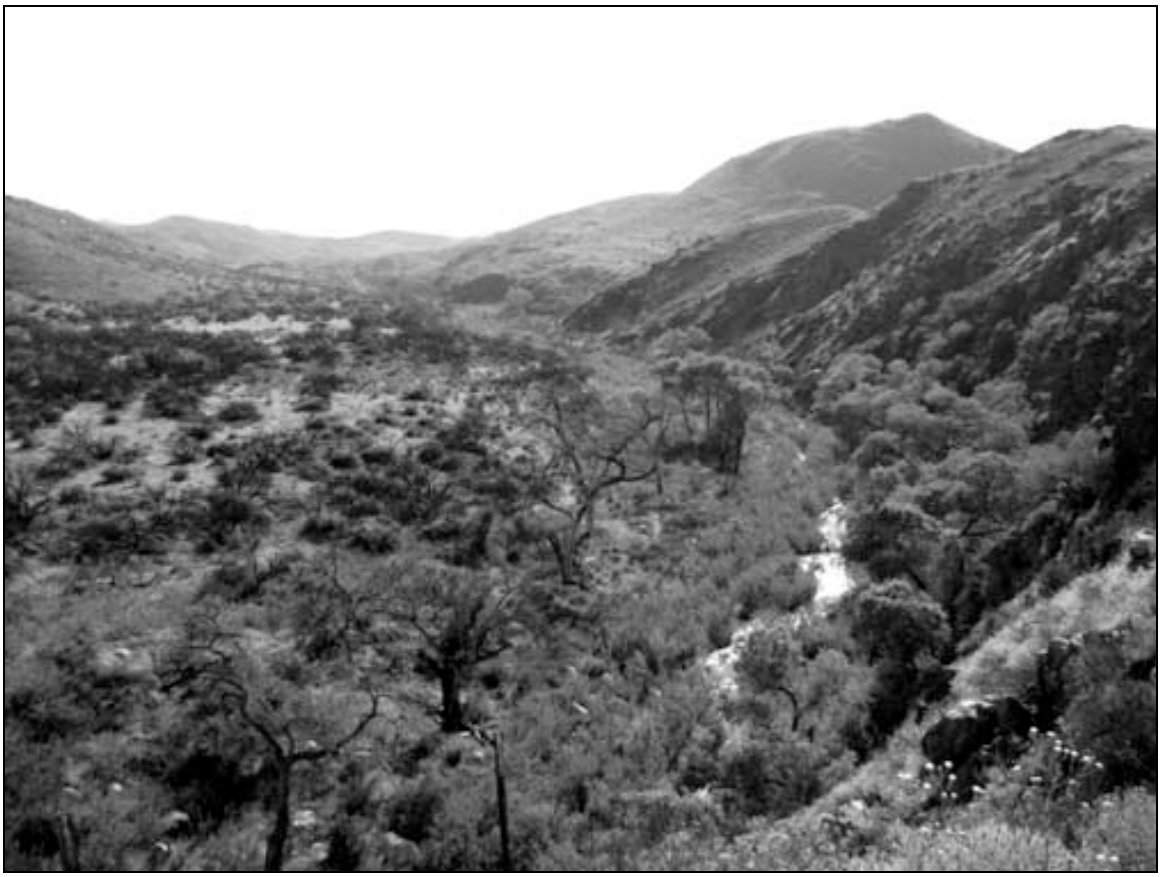

Figure 3. Typical Habitat as Viewed in Las Calabazas

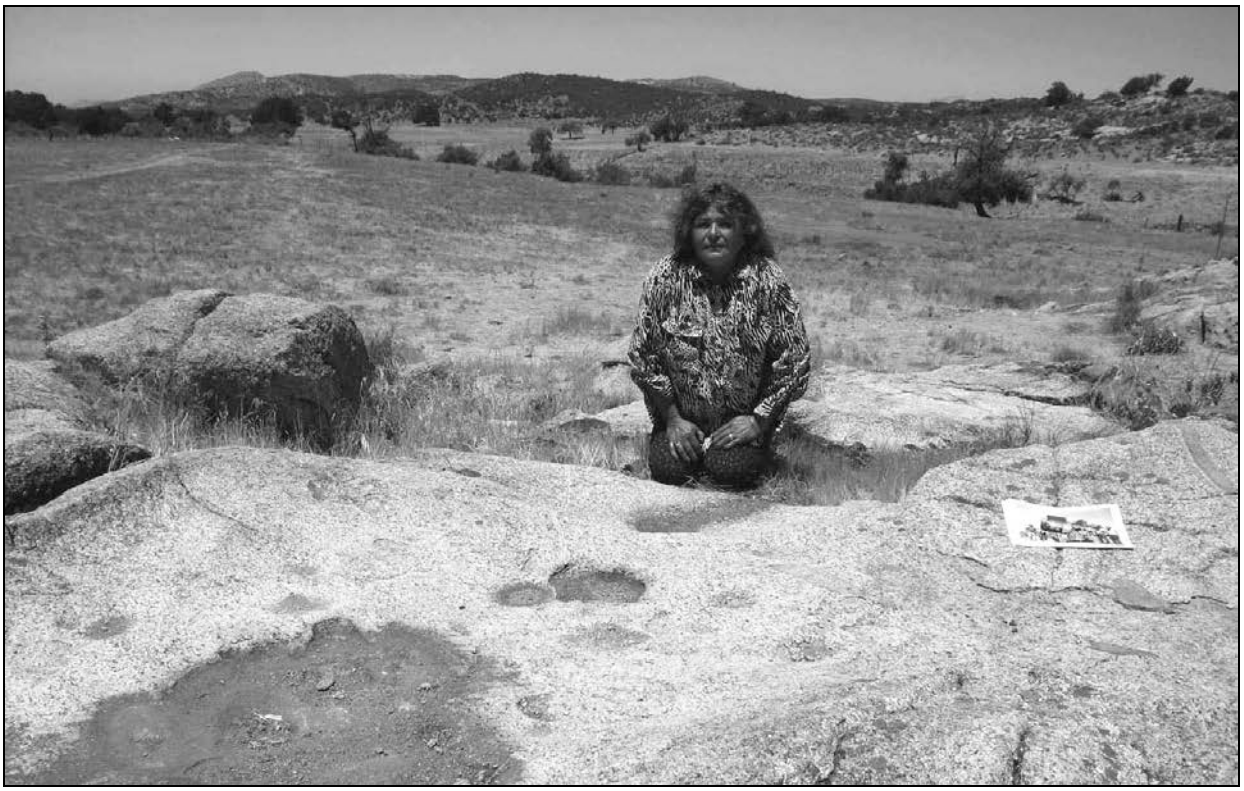

Figure 4. Enriqueta Mata Meza at Nejí East with Bedrock Mortars in Foreground and Grassland and Chaparral Vegetation in Background

Figure 5. Teodora Cuero near Las Calabazas with “Cuyamaca Oval”: Bedrock Milling Feature

Figure 6. Benita Meza and her Daughter Aurora Meza Gathering Sage Seeds on the Way to Las Calabazas

Figure 7. House Foundation at Ha’a

Figure 8. Boulder at Ha’a with Hole that Served as Window in House

Figure 9. View of Chapel Wall at Ha’a with Carved Niche

Figure 10. Peña Blanca

Figure 11. Josefina López Meza at Peña Blanca

Figure 12. Telma Meza, Julia Meza Thing, and Teodora Cuero in Front of Rock Art Panel at San Jose Tecate

Figure 13. Petracuña with her Horse in Jacumba

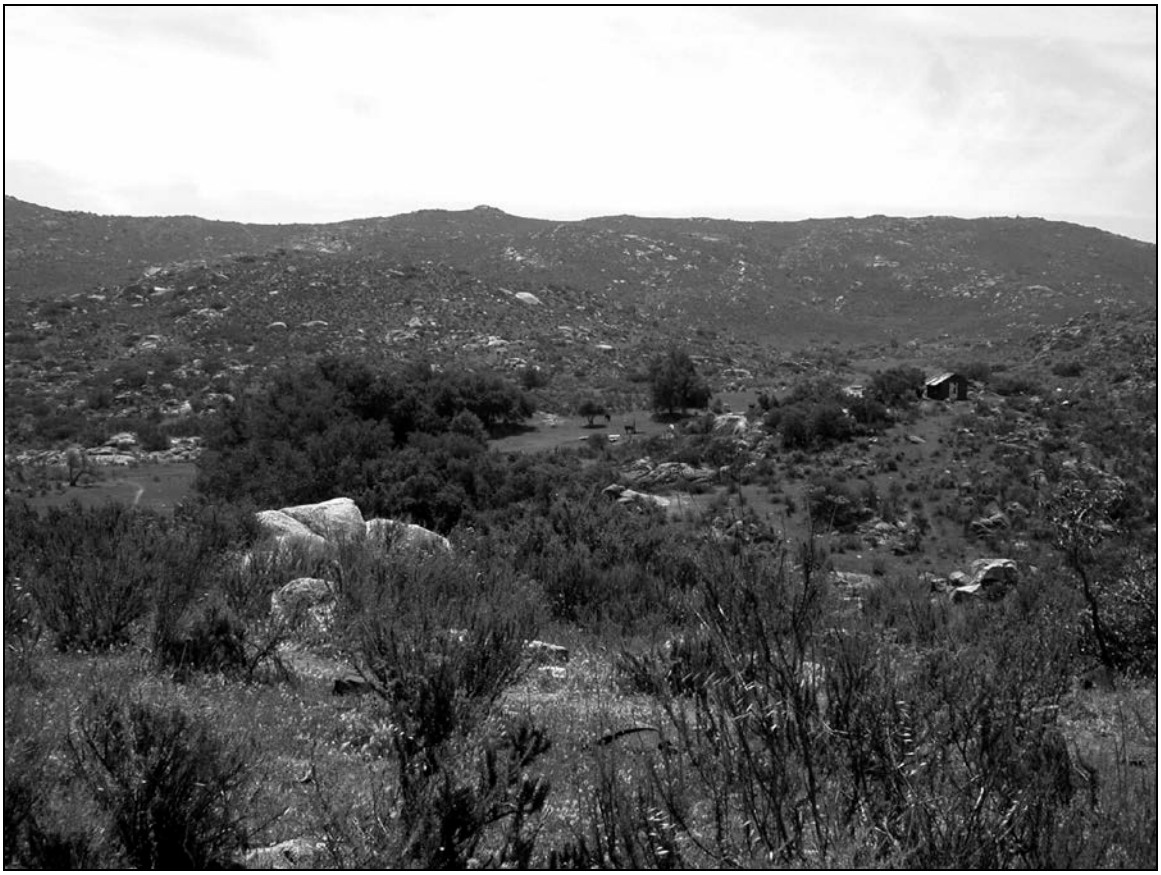

Figure 14. Landscape at Aguaje de la Tuna

Figure 15. Estefana Pérez Osuna with Pestle and Bedrock Mortar at Aguaje de la Tuna