

Excerpted from

singing the turtles to sea

the comcáac (seri) art and science of reptiles



Gary Paul Nabhan

WITH A FOREWORD BY HARRY W. GREENE

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islands of uniqueness

Endangered Cultural Knowledge of Endemic Creatures

Both species and languages have evolved over hundreds or thousands of years to adapt to very specific environmental and sociopolitical contexts. If those contexts undergo unprecedented rapid change—as the world’s environments and cultures are now doing—many species and languages will likely lack the resiliency to adapt to new conditions. In biology, island-dwelling species are hallmarks of such highly specialized, highly vulnerable lifeforms; and sure enough, exactly 75% of all recorded animal extinctions occurring since 1600 have been of island species.

DAVID HARMON, “The Converging Extinction Crisis” (1996)



Our nostrils flared as we entered the smoky plume of the fiesta, walking into the gathering from the other side of the village's largest satellite dish. The acrid bite of woodsmoke from elephant tree and mesquite filled the sandy opening between the rows of houses on the northern edge of Punta Chueca. Because we arrived in the dark, we had no idea how the fiesta was staged or where we should stand. The meager light projecting out from nearby houses and from a lone cooking fire was barely enough to guide us between the circles of singing, gambling, dancing, and eating.

I told my friends to go on ahead while I let my eyes adjust. I took a deep breath and tried to figure out what I was doing out at midnight at a Com-cáac puberty ceremony on the shores of the Sea of Cortés.

I could smell and hear meat sizzling on a grill hidden somewhere beyond my view. I meandered through the crowd, trying to find where food was being served, and ended up beneath a newly constructed ceremonial bower where the girl of honor stood. The bower of freshly cut branches inundated the puberty celebrant in the rich fragrances of ocotillo, red elephant tree, and desert lavender, but I could not identify them by sight at the time, the light was so spotty. A broth was cooling in a big pot nearby; I located it by

following its vapor trail and savory smell. My vision blinked on and off as Comcáac fiesta-goers walked back and forth in front of two weak spotlights and the cookfire. At the same time, my nose took in a steady flow of aromatic information.

Earlier that afternoon, while we were working on constructing a sanctuary for threatened chuckwallas, the tribal chairman's wife had come by to invite us to the celebration marking her niece's passage into womanhood. Finishing up work after dark, we then went searching for the fiesta, and that is when we heard the partying on the other side of the satellite dish. The honoree looked no more than a girl, one perhaps prone to listen more to Latin rock on the radio than to her uncle's Yaqui-style *pascola* songs being sung a few feet away from her. She might have wanted to be at a Mexican-style *quinceañera* party where she could dance the *cumbia* with a prospective boyfriend, instead of letting the world know that she had recently made her passage into womanhood.

And yet there she was, giggling and whispering with her sister while boys her age danced to the *pascola* songs one by one, shaking the silkmoth cocoon rattles on their ankles, making their feet sing like those of flamenco dancers. She must have known how much the persistence of this ceremony meant to the elders around her, including her grandparents. By acquiescing to be the honoree, she was allowing her entire Comcáac community to maintain its spiritual traditions even as massive social, economic, and environmental changes were churning up all around them. As we kept an eye on her, one of her young, slightly inebriated cousins kept his eye on us. He would approach us and very seriously request that we sing an American song or recite our life histories into his tape recorder, so that he could "save" this event for posterity.

While most of my co-workers tried to shake this amateur anthropologist by inching into the crowd formed around the *pascola* dancers, my partner Laurie and I sat and tried our hand at the traditional gambling games. I teamed up with a former tribal chairman in the men's game of sleight of

hand: "Which cane reed is filled with sand?" We were great at baffling the others, but poor at reading their poker faces when it came time for them to fool us. Laurie had better luck, winning several necklaces from women who sat around a circle made from slices of Organpipe cactus stems. Soon Laurie was invited by the honoree's mother to help herself to some of the feast food being served on the other side of the campfire.

A minute later, Laurie nudged me and whispered, "They're serving tacos made with Green Sea Turtle meat." She handed me a plateful.

"¿Caguama? ¿Carrinegra?" I asked, a bit incredulous.

Sea turtles had declined so precipitously in the Sea of Cortés that I had seen only a handful of their carapaces in Punta Chueca over the previous year, and those were from turtles accidentally caught in fishing nets. Two decades before, freshly butchered carapaces were ubiquitous, so much so that they were frequently used as roof thatch on traditional huts. The Mexican government finally placed a ban on commercial sales of all sea turtle products, but the Comcaác still have rights to capture Green Sea Turtles for ceremonial purposes.

"¿Qué tipo de moosni es?" I asked Ernesto Molina, who stood beside us nibbling on a turtle taco.

"Cooyam," he uttered between mouthfuls, referring to the younger migratory Green Sea Turtles that arrive from the south in the spring earlier than the rest.

Ernesto finished his taco, then asked us, "Have you tried their juice—the sea turtle broth?" He disappeared into the crowd and, when he returned, handed me a cupful of turtle broth. It tasted a bit like one of my favorite Mexican dishes, *birria*. The sweet broth was still cooling, and as it did, tender, oil-rich flakes of turtle meat floated to the top.

As I tossed my head back to down the last spoonfuls of broth, I saw for the first time what had been above us the entire evening. Tied to a branch directly above the men's gambling circle was the freshly butchered head of a sea turtle, dark green scales glistening in the meager light.

It dawned on me that we were participating in a sacrament, one that has

been performed ever since the Comcáac first became seafaring people. By blessing this young woman's rite of passage with the meat and blood of *moosni cooyam*, they were linking her life to the very creature that swims through their culture's stories, songs, dreams, and diet.

I felt honored and humbled to be part of the communion. But as I looked up again into the face of the sea turtle shining in the firelight, another wave of emotion washed over me. Because I once shared quarters with a marine biologist who worked tirelessly to protect the nesting beaches of sea turtles, I had for twenty years boycotted any restaurants that featured sea turtle meat, eggs, or soup.

Caught up in the moment, perhaps flattered by the invitation to share sea turtle with Seri friends, had I suffered some ethical lapse, somehow forgetting that sea turtles are endangered? Or had I not let my ethics slip, but instead accepted a tenuous balance between how I express my concern for an endangered people and how I express my concern for an endangered animal?

The young Seri anthropologist reappeared with his tape recorder, which no longer held either tape or batteries. Nevertheless, he wanted to talk with me. He held the recorder up in front of my mouth.

"Well," he began, "tell me about your culture. What are your beliefs?"

A GRILLED MORSEL of turtle meat passes between hands, then disappears between two sunburned lips. Sacramental meals of sea turtle have been shared on the shores of the Sea of Cortés for centuries, especially among those seafarers known to others as the Seri. While those Comcáac families living along the central Gulf coast of Sonora have always savored sea turtle meat, they especially value the opportunity to participate in this ritual today, because it takes place less and less frequently. Turtle meat has become scarce.

It is a scarcity that would have been unimaginable to Comcáac seafarers a century ago. The five sea turtle species formerly abundant off the west coast of Mexico have recently been decimated by the loss of nesting habitat, incidental



Figure 1. A Western Coralsnake, known to the Comcáac as *coftj*, is considered both poisonous and dangerous by many biologists, but not by most Seri individuals. This drawing by Gabriel Hoeffler of Desemboque was commissioned by Gary Nabhan in 1998.

take by shrimp trawlers and drift nets, overharvesting by commercial turtle fishermen, and clandestine collection of turtle eggs on beaches. Each time I see a Seri friend partaking of this traditional food, I wonder how long it will be before such consumption is no longer permitted by federal or international law, or no longer possible as a result of the complete collapse of sea turtle populations. Comcáac children today seldom see the roasting or smell the sizzling of turtle meat, even though their grandparents grew up immersed in those sights, tastes, and smells.

Despite these declines, however, sea turtles and many other reptiles remain present in the region; fortunately, they also remain present in the songs, stories, and art of indigenous residents of the Sonoran coast (Fig. 1). Whenever I have gone with Comcáac fishermen to the islands of the Sea of Cortés, they have shown me turtles, tortoises, lizards, and snakes that I would be unable to see anywhere else in the world (Fig. 2). From fishermen and herbalists I have heard commentaries on natural history, local uses, and appropriate ways of harvesting that cannot be heard in villages of other cultures nearby.

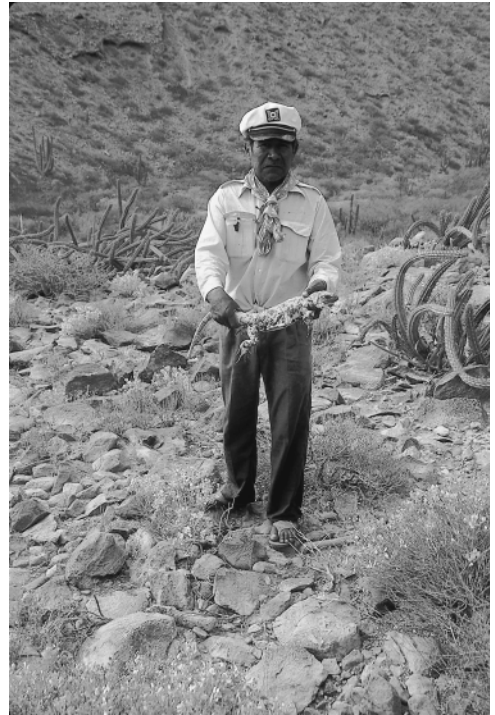


Figure 2. Alfredo López displays a freshly captured Piebald Chuckwalla on Isla San Esteban. He is one of several middle-aged men who now work part of the year as guides and collaborators for wildlife biologists in the midriff islands. (Photo Gary Nabhan, 1998)

“There are rattlesnakes without fully formed rattles on Islas San Esteban, San Lorenzo, and Ángel de la Guarda. And on Tiburón, there are Desert Tortoises that for us are like the Leatherback Sea Turtles, [in the sense that] they could talk with us because they were once people themselves. The Piebald Chuckwallas of San Esteban? We know how to find them, to get them to move, by making a windlike noise with a bullroarer.”

ERNESTO MOLINA, *Punta Chueca*

I believe this unique body of cultural knowledge is worth paying attention to, as much as I believe that the endemic plants and animals of this coastal desert warrant our curiosity, care, and delight. Even if you or I never eat a Black Chuckwalla, harm a Regal Horned Lizard, or use a local saltbush to treat snakebite, the ways in which the Comcáac community engages itself with these plants and animals is worthy of our understanding.

Figure 3. The central Gulf coast region of the Sonoran Desert, far from being a barren “wasteland,” supports some of the highest levels of endemism among native plants and animals of any landscape in North America. (Photo Gary Nabhan, 1997)



Much of this ethnobiological knowledge can be expressed only in Cmique Iitom, the Comcáac tongue, which is considered a language isolate, unrelated to any other language now spoken in Sonora, or anywhere else in the world for that matter (Marlett 2000). It is also a body of knowledge restricted to the driest portions of the Sonoran Desert and the midriff islands in the Sea of Cortés (Fig. 3). That coastal desert, with the stunning beauty of its seascapes and rugged mountains, has a bewildering capacity to support a diversity of life-forms seldom seen anywhere else in such odd juxtapositions.

“Before, the boojums [an endemic plant] were people—people named Cototaj. They were once people who were trying to climb high up to the tops of those hills when it [the Great Flood] happened. They were climbing because they were terrified of the tide that was rising. In that time, tidal waves came to terminate the world. This tide was rising up toward the top of the world, to finish off the world. The Cototaj were so scared that they were trying to escape. They were people then, but they were changed [into giant plants] as the rising sea reached their feet.”

ADOLFO BURGOS OF DESEMBOQUE, *visiting the only boojum population in Sonora*

To place such cultural knowledge about wildlife and landscapes in perspective, it is worth remembering that the Comcáac are engaged daily with life-forms and land-forms not necessarily found in other parts of the world. Few members of other cultures, and even few natural scientists, have spent as much time observing certain unique reptiles and plants in their habitats as the Comcáac have. Mexico as a whole, and the Sea of Cortés region in particular, are rich in what biogeographer Eduardo Rapoport (1982) calls *micro-areal endemics*. However clumsy this term, it is all we have to refer to plants or animals limited to small geographic areas, with distributions covering no more than a 250-kilometer by 100-kilometer extent—an area so small that a Comcáac traveler could circumscribe their entire range within a week’s walk. The Sonoran Desert

has many species of plants, as well as some mammals and reptiles, with such small ranges.

Although no precise estimate exists for the number of micro-areal endemics within Mexico, fair estimates have been made of the number of species that are *geopolitically endemic*, that is, restricted entirely within the Republic of Mexico, or *bioregionally endemic*, found within bioregions that are centered in Mexico. The Republic of Mexico ranks second among all nations for harboring the greatest number of vertebrate animal species—at least 761—that live nowhere else in the world (Harmon 1995). It ranks fourth among nations for the size of its flora, which encompasses some 22,000 vascular plant species (Rzedowski 1993). Within “MegaMéxico 1,” a bioregion defined by biogeographer Jerzy Rzedowski (1993) as Mexico plus the U.S. Southwest, desert scrublands and semi-arid grasslands host the greatest number of endemic species—at least 5,600—of any biome or habitat complex.

Significantly, Mexico is home to 230 languages unspoken beyond its boundaries, placing it sixth among nations in terms of extant cultural diversity and endemic languages (Harmon 1995). Because most unique cultural knowledge about plants and animals is “encoded” in specific terms for describing behavior, morphology, and habitat, assessments of linguistic diversity are often the first steps taken as scholars attempt to gauge a region’s specialized ethnobiological knowledge.

Although the arid scrublands of Baja California and the Chihuahuan Desert region have lost most of the ethnic groups that lived there during the pre-Columbian and colonial eras, Sonora’s indigenous desert dwellers have fared far better. Most students of Mexico’s cultural history recognize the contributions made by the ethnic groups commonly known as the Yaqui and Mayo (Yoemem), the Seri (Comcáac), the Cocopa (Cucupá), and the Papago-Pima (O’odham), who collectively number in the tens of thousands today. The populations of most of these groups are larger than a century ago, though that does not mean that more people now speak their native languages. Nor does it mean that cultural knowledge about local plants and animals remains intact, for not

all residents of the region have exposure to the plants and animals endemic to the desert and sea.

The Sea of Cortés region remains a prominent contributor of endemics to the biota of Mexico as a whole, though the Seri, Yaqui, Mayo, and Cocopa are the only indigenous groups still making a living along its shores. The islands of the Sea of Cortés, as well as coastal Baja California and coastal Sonora, are noted for their impressive roster of endemic fauna and flora (Tables 1 and 2). Of plant species unique to the region, 42.8 percent are known, used, or named by the Comcáac community (Felger and Moser 1985; Nabhan field notes). I have searched ethnobiological and linguistic literature for neighboring cultures' knowledge of these same organisms and have yet to find even 15 percent of the species on these lists that are named in other languages. Of course, names are merely the entry point into the domain of cultural knowledge that a community may share. And yet, if one culture does not even name an organism, while another not only names it but also has terms to describe its morphology or anatomy, it is likely that the latter culture has unique knowledge of the ecology and behavior of the organism in question. The Comcáac do encode cultural knowledge about certain geographically restricted species in their language—knowledge about where these organisms live, when they reproduce, and what they are “good for.” This is knowledge that would likely not be found among neighboring communities if the Comcáac themselves ever “lost” or “abandoned” it, for whatever reasons.

Could it be that after centuries of intermittent contact with O'odham, Yoemem, Cucupá, and mestizo cultures, the Comcáac have retained a knowledge of the natural world that is marked by limited borrowing, and hence unique? I have come across only a few O'odham and Yoemem uses of the Comcáac term for sea turtles (*moosni*), and rare Comcáac appropriations of O'odham terms, such as for broomrape (*matar*, from *mo'ostalk*) and for bighorn (*ceso*, from *ceşoiñ*) (Felger and Moser 1985). It seems that when the Comcáac engaged in hunting and fishing over the last few centuries, they discussed wildlife largely in their own language, not in Spanish—the lingua franca for other economic activities—or in a neighboring Uto-Aztecan dialect.

TABLE 1

Endemic Terrestrial Fauna of Large Midriff Islands Visited by Comcaac Seafarers

<u>Species</u>	<u>Island</u>
LIZARDS	
CROTAPHYTIDAE	
<i>Crotaphytus insularis</i>	Ángel de la Guarda
IGUANIDAE	
<i>Ctenosaura conspicuosa</i>	Cholludo, San Esteban
<i>C. nolascentis</i>	San Pedro Nolasco
<i>Dipsosaurus catalinensis</i>	Santa Catalina
<i>Sauromalus hispidus</i>	Many
<i>S. klauberi</i>	Santa Catalina
<i>S. slevini</i>	Carmen, Coronados, Monserrate
<i>S. varius</i>	Roca Lobos, San Esteban
PHRYNOSOMATIDAE	
<i>Petrosaurus slevini</i>	Ángel de la Guarda, Mejía
<i>Sceloporus angustus</i>	San Diego, Santa Cruz
<i>S. grandaevus</i>	Cerralvo
<i>S. lineatulus</i>	Santa Catalina
<i>Uta lowei</i>	El Muero
<i>U. nolascentis</i>	San Pedro Nolasco
<i>U. palmeri</i>	San Pedro Mártir
<i>U. squamata</i>	Santa Catalina
<i>U. tumidarostra</i>	Colaradito
EUBLEPHARIDAE	
<i>Coleonyx gypsicolus</i>	San Marcos
GEKKONIDAE	
<i>Phyllodactylus bugastrolepis</i>	Santa Catalina
<i>P. partidus</i>	Cardonosa Este, Partida Norte
TEIIDAE	
<i>Cnemidophorus bacatus</i>	San Pedro Nolasco
<i>C. canus</i>	Salsipudes, San Lorenzo Norte and Sur
<i>C. carmenensis</i>	Carmen
<i>C. catalinensis</i>	Santa Catalina
<i>C. ceralbensis</i>	Cerralvo
<i>C. danheimae</i>	San José
<i>C. spiritensis</i>	Espíritu Santo, Partida Sur
<i>C. franciscensis</i>	San Francisco
<i>C. martyris</i>	San Pedro Mártir
<i>C. pictus</i>	Monserrate

TABLE 1 (continued)

<u>Species</u>	<u>Island</u>
SNAKES	
COLUBRIDAE	
<i>Chilomeniscus punctatissimus</i>	Espíritu Santo, Partida Sur
<i>C. savagei</i>	Cerralvo
<i>Eridiphas marcosensis</i>	San Marcos
<i>Hypsiglena gularis</i>	Partida Norte
<i>Lampropeltis catalinensis</i>	Catalina
<i>Masticophis barbouri</i>	San Pedro Mártir
<i>M. slevini</i>	San Esteban
<i>Rhinocheilus etheridgei</i>	Cerralvo
VIPERIDAE	
<i>Crotalus angelensis</i>	Ángel de la Guarda
<i>C. catalinensis</i>	Santa Catalina
<i>C. estebanensis</i>	San Esteban
<i>C. mitchellii</i>	Espíritu Santo, Partida Sur, Salsipuedes, others
<i>C. muertensis</i>	El Muerto
<i>C. tortugensis</i>	Tortuga
MAMMALS	
CANIDAE	
<i>Canis latrans jamesi</i>	Tiburón
CERVIDAE	
<i>Odocoileus hemionus peninsula</i>	San José
<i>O. h. sheldoni</i>	Santa Cruz
HETEROMYIDAE	
<i>Dipodomys insularis</i>	San José
<i>D. merriami mitchellii</i>	Tiburón
<i>Perognathus arenarius siccus</i>	Cerralvo
<i>P. baileyi insularis</i>	Tiburón
<i>P. penicillatus seri</i>	Tiburón
<i>P. spinatus bryanti</i>	San José
<i>P. s. evermani</i>	Mejía, Granito
<i>P. s. guardiaie</i>	Ángel de la Guarda, Las Ánimas
<i>P. s. lambi</i>	Espíritu Santo
<i>P. s. latijugularis</i>	San Francisco
<i>P. s. marcosensis</i>	Santa Catalina
<i>P. s. occultus</i>	Carmen
<i>P. s. pullus</i>	Coronados
<i>P. s. seorsus</i>	Danzante

Continued on next page

TABLE 1 (continued)

<u>Species</u>	<u>Island</u>
LEPORIDAE	
<i>Lepus alleni tiburonensis</i>	Tiburón
<i>L. californicus sheldoni</i>	Carmen
<i>L. insularis</i>	Espíritu Santo
<i>Sylvilagus mansuetas</i>	San José
MURIDAE	
<i>Neotoma albigula seri</i>	Tiburón
<i>N. bunker</i>	Coronados
<i>N. lepida abbreviata</i>	San Francisco
<i>N. l. insularis</i>	Ángel de la Guarda, Mejía
<i>N. l. latirostra</i>	Espíritu Santo
<i>N. l. marcosensis</i>	Santa Catalina
<i>N. l. nudicaula</i>	Carmen
<i>N. l. perpallida</i>	San José
<i>N. l. vicina</i>	Espíritu Santo
<i>N. varia</i>	Dátil
<i>Peromyscus caniceps</i>	Montserrat
<i>P. dickeyi</i>	Tortuga
<i>P. ermicus angelensis</i>	Ángel de la Guarda
<i>P. e. avius</i>	Cerralvo
<i>P. e. carmeni</i>	Carmen
<i>P. e. cinereus</i>	San José
<i>P. guardia guardia</i>	Ángel de la Guarda
<i>P. g. mejiae</i>	Mejía, Granito
<i>P. interparietalis</i>	Las Ánimas, Salsipudes, San Lorenzo
<i>P. pseudocrinatus</i>	Cerralvo
<i>P. sejugis</i>	San Diego, Santa Catalina
<i>P. slevini</i>	San Marcos
<i>P. stephani</i>	San Esteban
PROCYONIDAE	
<i>Bassariscus astutus insulicola</i>	San José
<i>B. a. saxicola</i>	Espíritu Santo
SCIURIDAE	
<i>Ammospermophilus insularis</i>	Espíritu Santo
VESPERTILIONIDAE	
<i>Myotis vivesi</i>	Tiburón

Sources: Grismer 1999; Case and Cody 1983; Figueroa 1999.

TABLE 2

Endemic Terrestrial Flora of Large Midriff Islands and Adjacent Central Gulf Coast

<u>Species</u>	<u>Range</u>	<u>Used or Named by Comcáac</u>
AGAVACEAE		
<i>Agave cerulata</i> var. <i>dentiens</i>	San Esteban	Used as food
<i>A. felgeri</i>	Bahía San Carlos, Sonora	Probably used as soap
<i>A. pelona</i>	Sonoran coast	Used as food
<i>A. subsimplex</i>	Sonoran coast	Used as food and in art
<i>Brahea armata</i>	Ángel de la Guarda, Tiburón, Baja coast	Known, but not used
<i>B. roezlii</i>	Bahía San Carlos, Sonora	Used as headpieces
ASTERACEAE		
<i>Triopetalum crenatum</i> var. <i>racemosum</i>	Espíritu Santo	No
BORAGINACEAE		
<i>Cryptantha grayi</i> var. <i>racemosum</i>	Espíritu Santo	No
CACTACEAE		
<i>Echinocereus grandis</i>	San Esteban, San Lorenzo	Used as food
<i>E. websterianus</i>	San Pedro Nolasco	No; related species used
<i>Ferocactus diguetii</i>	Ángel de la Guarda	No; related species used
FABACEAE		
<i>Acacia willardiana</i>	Tiburón, San Pedro Nolasco, and Sonoran coast	Used for tools and shelter
POLYGONACEAE		
<i>Eriogonum angelense</i>	Ángel de la Guarda	No; related species used

“During the era of Coyote Iguana [a Seri who kidnapped and married a Mexican girl, Lola Casanova, around 1850], a full-blooded Seri woman we call Virginia lived at Pozo Coyote. Her daughters were among the few who married Papago, Yaqui, and Spanish men who would come there to trade skins of deer, javelina, and cloth. But it is an old Seri village, one we call Hatájc Ano Ziix Coocö—Where Coyote Came to Drink.”

AMALIA ASTORGA OF DESEMBOQUE, while visiting Pozo Coyote

Except through trading, a few intermarriages, and a few joint fishing and foraging trips where their territories overlap with those of other indigenous groups, the Comcáac historically had little chance to share their unique ethnobiological knowledge with other cultures, a sharing that occurred with Nahuatl and Cahitan speakers. From my perusal of Sobarzo's *Vocabulario sonorense* (1966) and Molina's *Nombres indígenas de Sonora y su traducción al español* (1972)—two linguistic compendia of loan words from the region's indigenous languages—it is clear that plant and animal names from Cmique Iitom have entered into the regional lexicon far less than those from other native languages. It is therefore appropriate to speak of their understanding of the native biota of the central Gulf coast of Sonora and the midriff islands nearby as *endemic ecological knowledge*.

David Harmon, a co-founder of Terralingua, a group concerned with the loss of native languages, offered one of the first perspectives on the importance of this endemic ecological knowledge:

Endemicity calls to mind another intriguing possibility: that numerous small cultural groups have co-evolved with the locally adapted animals and plants around them. While this possibility must remain quite speculative at this point, the intimate knowledge indigenous peoples often have of their immediate environment, and their traditional dependence on it, beckons us toward further consideration of co-evolution. Whatever the case, traditional environmental knowledge is increasingly being seen as valid scientific information by biologists. . . .

Unfortunately, as more and more native groups are set adrift in the flood tide of globalized pop culture, this knowledge runs the risk of being lost. (Harmon 1996)

"When I was tribal governor a few years back, I realized that we faced more subtle threats [than genocide]. Tourism promoters wanted to build hotels and roads on

our islands, saying that it would benefit the Seri people. ‘Sign here,’ they’d say, ‘it’s simple.’ But I wouldn’t sign off on any development on the islands. Finally, a politician got mad at me and said, ‘Just how much do you think your *pinché* island will ever be worth if it isn’t developed?’

“That made me mad. I said to him, ‘That island is worth more than you could ever pay us, because it has had the blood of my people’s veins running into its sand. It is offensive to us to think of selling land that our people have died for.’”

GENARO HERRERA, *former tribal governor, Punta Chueca*

When *Time* magazine presented its cover story “Lost Tribes, Lost Knowledge” by Eugene Linden (1991), much of the coverage dealt with the unique ecological and medical knowledge encoded in endemic languages. Linden was preoccupied with “rainforest peoples” who restrict their movements to relatively small areas of the Amazon Basin, know the local wildlife there intimately, and now suffer from the impacts of deforestation. He is, moreover, one of many observers to relate the degree of geographic restriction of various indigenous populations to their vulnerability to extinction by destruction of their habitat. As a humanitarian, Linden argued that these geographically restricted peoples need support simply because their younger generations deserve a future in their fatherlands. Yet he also argued that we should be concerned with their plight as well because they hold unique knowledge about medicinal plants and other natural resources that potentially offer benefits to other societies. If these “endemic” tribes, their languages, or their knowledge becomes lost, the rest of us will be unable to benefit from the cultural and ecological insights they accumulated over thousands of years.

Of course, saying that a creature, a language, or a cultural knowledge base is endemic is not the same as saying that it is endangered. Designating any entity as endangered—whether indigenous culture or native creature—is not merely to conclude that its continued decline is highly probable; it is also to make an emotionally charged and politically mediated judgment.

“Many people have said that indigenous peoples are myths of the past, ruins that have died. But indigenous communities are not vestiges of the past, nor are they myths. They are full of vitality and have a course and a future . . . [with] much wisdom and richness to contribute. They have not killed us and they will not kill us now. We are stepping forth to say, ‘No, we are here. We live.’ ”

RIGOBERTA MENCHÚ, *Nobel Peace Prize laureate*

Too often, the pronouncement of “endangerment” sounds like an obituary rather than an early warning that additional protective or supportive measures should be put into place. This is why activists involved in ecological restoration and language revitalization efforts do not believe that offering support only to those closest to extinction is sufficient to safeguard diversity; they emphasize the need to safeguard entire communities rather than just a few members of those communities.

Despite the efforts of scholars such as Mace and Lande (1993), Soulé (1987), and Harmon (1996) to propose more comprehensive criteria for determining when a species or language is threatened with extinction, such criteria have yet to help those in the field. In particular, field biologists and resource managers have been forced into a “triage” mindset, having to recommend to environmental policymakers which species deserve immediate attention even though they often lack quantitative data documenting rates of decline. When biologists noticed that certain species endemic to the Sea of Cortés region had become exposed to new collecting threats, for instance, they urged Mexican government agencies to provide official protection for them. However, it was later learned that threats from collectors had far less impact on these species than did invasive species and habitat degradation. At the least, such recommendations have provided incentives for better monitoring the changing status of these species of concern.

The central Gulf coast of Sonora and the adjacent midriff islands are recognized as home to no less than twenty species of reptiles listed in Mexico’s Di-

ario oficial as threatened, endangered, or deserving of special protection status (Table 3). An additional six marine species that venture into the midriff area are also listed as globally threatened (Table 4), for example, the Leatherback Sea Turtle (Spotila et al. 1996).

TABLE 3

Terrestrial Species Considered Endangered, Threatened,
or Deserving of Special Protection Status in the Central Gulf Coast

<u>Species</u>	<u>English Name</u>	<u>Spanish Name</u>
PLANTS		
AGAVACEAE		
<i>Agave felgeri</i>	Felger's Amole	Amole
<i>A. pelona</i>	Bald Mescal	Mescal Pelón
ARECACEAE (PALMAE)		
<i>Brahea armata</i>	Mexican Blue Palm	Palma taco azul
<i>B. elegans</i>	Nacapuli Palm	Palma de Nacapuli
CACTACEAE		
<i>Ferocactus cylindraceus</i>	Cylindrical Barrel Cactus	Biznaga
<i>F. johnstonianus</i>	Island Barrel Cactus	Biznaga
<i>Mammillaris angelensis</i>	Isla San Esteban Fishhook Cactus	Cabeza del viejo
<i>M. estebanensis</i>	Isla San Esteban Fishhook Cactus	Cabeza del viejo
<i>Peniocereus striatus</i>	Sonoran Queen of the Night	Zaramatraca
FABACEAE		
<i>Olneya tesota</i>	Ironwood	Palo fierro
FOUQUIERIACEAE		
<i>Fouquieria columnaris</i>	Boojum	Cirio
MALVACEAE		
<i>Gossypium turneri</i>	Teta Cahui Cotton	Algodon de Teta Cahui
BIRDS		
ACCIPITRIDIAE		
<i>Accipiter cooperi</i>	Cooper's Hawk	Gavilán de Cooper
FALCONIDAE		
<i>Falco peregrinus</i>	Peregrine Falcon	Halcón peregrino

Continued on next page

TABLE 3 (continued)

<u>Species</u>	<u>English Name</u>	<u>Spanish Name</u>
FRINGILLIDAE		
<i>Passerculus sandwichensis</i>	Savannah Sparrow	Gorrión de savannas
LANIIDAE		
<i>Lanius ludovicianus</i>	Loggerhead Shrike	Cabezóna
PANDIONIDAE		
<i>Pandion haliaetus</i>	Osprey	Aguila pescador
PELECANIDAE		
<i>Pelecanus occidentalis</i>	Brown Pelican	Alcatraz café
TURTLES AND TORTOISES		
TESTUDINIDAE		
<i>Gopherus agassizii</i>	Desert Tortoise	Tortuga del monte
LIZARDS		
CROTAPHYTIDAE		
<i>Gambelia wislizenii</i>	Long-nosed Leopard Lizard	Lagartija de leoparda, cachora
IGUANIDAE		
<i>Sauromalus hispidus</i>	Spiny (Black) Chuckwalla	Iguana negra
<i>S. varius</i>	Piebald (San Esteban) Chuckwalla	Iguana de Isla San Esteban
PHRYNOSOMATIDAE		
<i>Callisaurus draconoides</i>	Zebra-tailed Lizard	Perrito
EUBLEPHARIDAE		
<i>Coleonyx variegatus</i>	Western Banded Gecko	Salamanquesa, gecko
HELODERMATIDAE		
<i>Heloderma suspectum</i>	Gila Monster	Escorpión pintado
SNAKES		
BOIDAE		
<i>Charina trivirgata</i>	Rosy Boa	Boa rosada
COLUBRIDAE		
<i>Chilomeniscus stramineus</i>	Bandless Sandsnake	Culebra de los médanos, coralillo falso

TABLE 3 (continued)

<u>Species</u>	<u>English Name</u>	<u>Spanish Name</u>
<i>Hypsiglena torquata</i>	Nightsnake	Culebra de la noche
<i>Masticophis estebanensis</i>	Isla San Esteban Coachwhip	Chirrionera
<i>M. flagellum</i>	Sonoran Coachwhip	Chirrionera
ELAPIDAE		
<i>Micruroides euryxanthus</i>	Western Coralsnake	Coralillo
VIPERIDAE		
<i>Crotalus atrox</i>	Western Diamondback Rattlesnake	Víbora de cascabel
<i>C. cerastes</i>	Sidewinder	Cuernitos
<i>C. estebanensis</i>	Isla San Esteban Rattlesnake	Víbora de cascabel de Isla San Esteban
<i>C. molossus</i>	Black-tailed Rattlesnake	Víbora de cascabel
<i>C. scutulatus</i>	Mohave Rattlesnake	Víbora de cascabel
<i>C. tigris</i>	Tiger Rattlesnake	Cascabel del tigre
MAMMALS		
ANTILOCAPRIDAE		
<i>Antilocapra americana sonoriensis</i>	Sonoran Pronghorn	Berrendo sonorense
BOVIDAE		
<i>Ovis canadensis mexicana</i>	Desert Bighorn Sheep	Borrego cimarrón
CANIDAE		
<i>Canis lupus</i>	Mexican Wolf	Lobo mexicano
<i>Vulpes macrotis</i>	Kit Fox	Zorro del desierto
FELIDAE		
<i>Felix onca</i>	Jaguar	Onza, yagour
PHYLLOSTOMIDAE		
<i>Choeronycteris mexicana</i>	Mexican Long-tongued Bat	Murciélago trompudo
<i>Leptonycteris curasoae</i>	Lesser Long-nosed Bat	Murciélago hocicudo mescalero

Sources: Mexico's *Diario Oficial*, U.S. *Federal Record*, CITES Appendix One, and IUCN/Species Survival Commission publications.

TABLE 4
Threatened Marine Fauna of the Sea of Cortés

<u>Species</u>	<u>English Name</u>	<u>Spanish Name</u>
FISH		
SCIAENIDAE		
<i>Totoaba macdonaldi</i>	Totoaba	Totoaba
TURTLES AND TORTOISES		
CHELONIIDAE		
<i>Caretta caretta</i>	Loggerhead Turtle	Caguama cabeza, jabalina
<i>Chelonia mydas</i>	Green Sea Turtle	Caguama carrinegra
<i>Eretmochelys imbricata</i>	Hawksbill	Carey, perico
<i>Lepidochelys olivacea</i>	Olive Ridley	Golfina
DERMOCHELYIDAE		
<i>Dermochelys coriacea</i>	Leatherback	Siete filos
CROCODILES		
CROCODYLIDAE		
<i>Crocodylus acutus</i>	River Crocodile	Cocodrilo, caimán
MAMMALS		
PHOCOENIDAE		
<i>Phocoena sinus</i>	Gulf of California Harbor Porpoise	Vaquita
ESCHRICHTIIDAE		
<i>Eschrichtius robustus</i>	Gray Whale	Ballena gris

“The government [environmental protection agency, PROFEPA] doesn’t bother us as long as we never try to sell sea turtle meat or eggs. It’s for consumption here only, as part of our ceremonies.

“We’re the only ones in Mexico permitted to harvest the Green Sea Turtle because we know how to do so without damaging the resource.”

GENARO HERRERA, *translated by Ernesto Molina, Punta Chueca*

When little other information is available, biologists often consider a species to be endangered when fewer than five hundred reproductive individuals remain in the wild (Soulé 1987). Certain linguists are now using a parallel benchmark, however rudimentary, for declaring that a language is endangered: if fewer than one thousand individuals remain who converse with one another in a particular native language, the language is considered to be at risk for extinction (Harmon 1996). Using data derived from a global *Ethnologue* survey of 5,635 endemic languages, Harmon (1995) determined that 1,513 languages meet this criterion, and another 220 are already “extinct.” Mexico is home to 26 of those endangered languages—8.5 percent of Mexico’s 230 indigenous languages—and another 4 are extinct. Among those 26 is Cmique Iitom.

I don’t believe many Seri individuals would accept this designation, based as it is solely on the group size of speakers, even though they might express concern that their young people are using more Spanish at the expense of conversing in Cmique Iitom. Cmique Iitom remains spoken in the vast majority of homes in Punta Chueca and Desemboque, in tribal meetings, and even in the schools, and so seems far from a “dying language” when you are in the midst of the Comcáac community. Although the majority of teachers in Punta Chueca and Desemboque offer lessons primarily in Spanish, the schoolchildren tend to answer in Cmique Iitom and are not currently chastised for doing so. Since the use of Cmique Iitom is by no means restricted to discussions among grandparents and other elders, it would be difficult to argue that it is dying out. To the contrary, if linguists who have worked with endangered languages elsewhere in the world were to visit a Comcáac village, I believe they would be heartened by the intensity and vitality of native language use they would hear there. While elders within the community worry that their grandchildren are not exercising the full range of expressiveness in Cmique Iitom, at least these youth have not entirely abandoned their native tongue.

“The language spoken here is changing. The young people understand only some of the words, and the shorter stories we tell them. . . . I have had to take into account for myself [as a teacher] that there are many terms in the Seri language that the children hardly know, or misuse [relative to their original meaning].”

PEDRO ROMERO, *former tribal governor and teacher, Punta Chueca*

On the other hand, scarcely more than 500 people left on the face of this planet speak Cmique Iitom as their first language. In a 1995 census, the 720 residents of Punta Chueca and Desemboque included only 518 individuals who identified themselves as 100 percent indigenous in parentage; even though all of these individuals consider themselves “Seri,” some of them have O’odham or Yoemem ancestry as well. Another 137 individuals identified themselves as having *mestizo*, or mixed, parentage—both Indian and non-Indian—and only a few of these residents speak Cmique Iitom as their first language. Of the 65 non-Indians, or “whites,” who lived in the settlements of Punta Chueca, Desemboque, Campo Egipto, and Punta Sargento in 1995, few had more than a rudimentary vocabulary in any indigenous language. In 1996 Emilia Estrada (pers. comm.) estimated that of the 650 Seri, only 550 speak their native language. Considering that not all of the children of mixed parentage have equal confidence in Spanish and Cmique Iitom, I would guess that fewer than 500 converse as frequently in their native tongue as they do in Spanish.

Given these difficulties in determining whether Cmique Iitom is truly an endangered language, what can be said about the Comcáac as an “endangered people”? Although their total population remains rather low, and some intermarriage occurs with non-Indians, the overall size of the Comcáac community has risen dramatically over the last few decades. Whereas the two permanent villages had over 650 indigenous residents in 1995, this is nearly four times the estimate of Seri individuals made by ethnologist W. J. McGee when visiting their camps at the end of the nineteenth century (Fig. 4). Once out-and-out warfare against the Comcáac terminated after 1904, and as health care and ex-



Figure 4. This posed portrait of a young Seri woman with traditional face paintings and a white pelican-skin dress was taken during the McGee expedition to Sonora in 1894. Such images established a stereotype of the Comcáac as picturesque but remote “primitives,” doing little to foster true cross-cultural understanding. The photo is courtesy of Thomas Vennum of the Smithsonian Institution, who “repatriated” copies of both audiotapes and photos in the National Anthropological Archives to the Comcáac community in 1997. (Photo William Dinwiddie, 1894)

tralocal food supplies have become available, their population has greatly expanded.

While the Comcáac seem to be recovering as an ethnic population, it is unclear whether demographic trends indicate an increasing probability of cultural persistence. In 1995, at least 56 percent of the population of the Comcáac com-

munities was under twenty-four years of age—under the mean marriage age of twenty-six (Becky Moser, pers. comm.); only 5 percent of the population was over sixty-five years of age. By the year 2010, the number of monolingual Comcáac who grew up with virtually no daily contact with non-Indians will likely be less than 1 percent of the population. Most future culture bearers in the Comcáac community will therefore be bilingual individuals accustomed to modern technologies and economic influences from both Mexico and the United States. In ways, they may also be considered bicultural.

Regardless of the population growth in Comcáac villages and the persistence of native language use, Seri elders express concern that the cultural knowledge they inherited from their ancestors is endangered, particularly in the domain of natural resources. The degree of retention or loss of such traditional ecological knowledge can be evaluated (Berkes 1999; Zent 1999); for the moment, however, two more fundamental issues concern me: What is truly lost when a native language and its traditional ecological knowledge are lost? And why should a cultural community work to avoid language death and strive to retain such knowledge (Crystal 2000)?

To answer these questions, using the Comcáac as our example, we must first explore how traditional ecological knowledge is transmitted and retained within the community (Nabhan 1998a). We can then consider how this knowledge has had nutritional, medical, spiritual, aesthetic, and social value over the course of Comcáac history, and the ways in which it is still valuable to the contemporary Comcáac. In addition, we can reflect upon how this traditional ecological knowledge might benefit the management of the native flora and fauna of the region and, if appropriately integrated into conservation plans, aid in keeping certain endemic species from extinction. We might also consider the potential benefits of Comcáac knowledge of the medicinal value of endemic plants and animals to other societies, should the Comcáac choose to share such knowledge with others, freely or for a fee. Finally, we might consider assigning additional value to Comcáac knowledge to the degree that it is unique—not “replicated” within other indigenous cultures or in the information warehouses and databases of the Western scientific community.

In the next few chapters I will explore the nature of Comcáac ecological knowledge, particularly as it relates to reptiles, the group of animals with the highest levels of endemism in the Sea of Cortés region. In doing so, I strive for a tangible sense of the tone and detail of how Seri individuals speak about particular reptiles. To do any less would be to perpetuate mere abstract generalities about Native Americans and Nature.