Historical Ecology in a Land of Confused Relief

Using Science, History, and Myth to Restore the Great Community in San Felipe Valley, California

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Dedicated to the memory of

Brad Aldern

a naturalist who knew the best way to tell a story

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Abstract

This thesis suggests a framework for ecological restoration that combines the viewpoints of science, history, and mythology. I apply this framework to a specific site: San Felipe Valley, California. Chapter 1 serves as a theoretical introduction, in which I explore community as an ecological idea, drawing analogies to models of human communities constructed by ethnographers. I then review various systems of historiography and consider the different timescales that are applicable to history and myth. After describing Henry David Thoreau's work as a historical ecologist, I distinguish scientific, historical, and cultural views of wildlands and introduce Josiah Royce's notion of the "great community" as the object of ecological restoration. Chapter 2 takes a scientific view of San Felipe's environment. Chapter 3 introduces archaeological, ethnographic, and historical evidence bearing on the transformation of the valley's landscape. Chapter 4 describes insights to be gained from San Felipe-area myth, oral tradition, and language. Finally, Chapter 5 reviews the tri-partite division of science, history, and myth, and the truths to be gained from each. This concluding chapter also briefly explains work in progress in the San Felipe vicinity, and proposes various future ecological restoration projects.

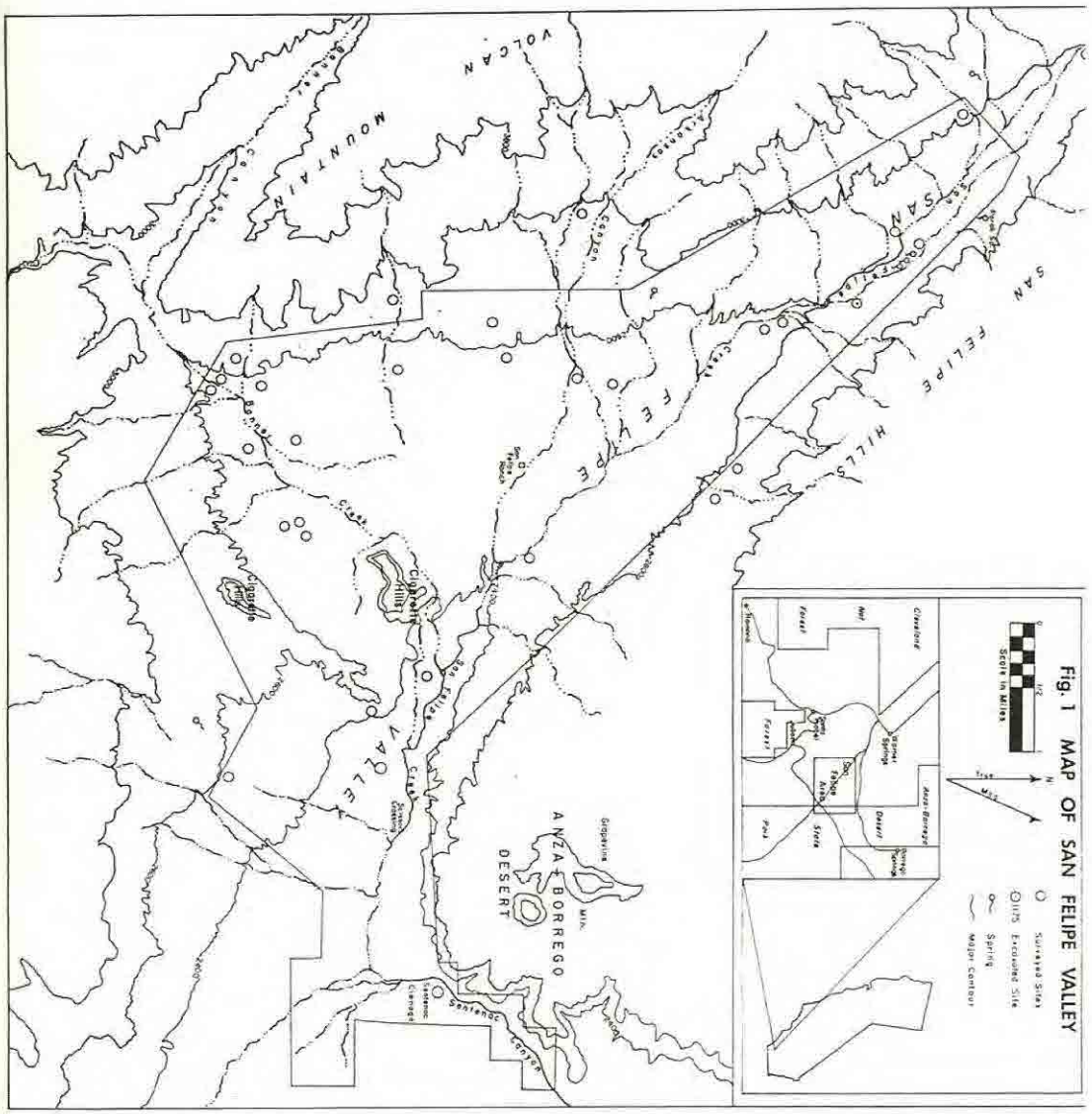

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Figure 2. San Felipe Valley, looking east from Cigarette Pass off California State Highway 78. Sentenac Cienega and the head of Sentenac Canyon are in the distance. Photo by the author, May 2002.

Figure 3. San Felipe Valley, looking southeast from near Teofulio Summit off San Diego County Highway S-2. Photo by the author, May 2002.

Chapter 1

Searching for an Entire Poem: Science, History, Myth, Environmental Restoration, and the Great Community

Surely history need not simply be condemned to the study of well-walled gardens?[1]
-- *Fernand Braudel*

What is a place's explanation? How did its physical and cultural characteristics develop? How have its land and cultures interacted? Can I possibly reconstruct the state of the place at some point in the past? Historical geographers, historical ecologists and environmental historians – scholars who study changes in the landscape and in people's interactions with land – ponder these and related questions. Answers to these questions form the basis for ecological restoration, the attempt to return an ecosystem to an earlier condition.

This thesis suggests a framework for restoration: scientific, historical, and mythological methods – and in southern California any consideration of long-term history and myth must include inquiry into American Indian culture and land management – that combine to form as complete an image as possible of a place. I will apply these approaches to a specific site: San Felipe Valley, California. I do so in the hope that the beginnings of a fully modeled portrait of San Felipe– and a sense of what Henry David Thoreau called a place's "entire poem"– will begin to emerge. Along the way, I will try to broaden current ideas of restoration by drawing on Aldo Leopold's notions of land as community, Fernand Braudel's *longue durée,* and Josiah Royce's idea

of the "great community." I will suggest that this great community, still resident in San Felipe, is the object to be restored.

The geographer Carl Sauer developed a method of approach to the study of change in the interactions of land and culture – to the pursuit of answers to the questions asked above. A later writer summarized Sauer's method as "original field observation combined with utilization of key archival source materials, as well as familiarity with contemporary sources to solve problems in the evolution of landscape patterns and origins of cultural systems."[2] Sauer, in other words, fused natural science with human history in order to produce great syntheses of environmental information.[3] He collected data on the San Felipe, California area in the 1920's, and he published a paper on its geomorphology in which he noted the special challenges presented to researchers by the Peninsular Range region:

> ...it is a land of confused relief, in which almost every change in the horizon discloses unexpected features, in which even within the horizon the basins may remain hidden from view until one stands on their brink, and in which the drainage pattern gives scarcely a clue as to topography.[4]

An equally complex ecological and cultural landscape reflects the "confused relief" Peninsular Range topography, so it is unfortunate that Sauer abandoned his study of the San Felipe area after his field observations, deciding not to inquire more deeply into archival sources or into the origins of the area's cultural systems. As he wrote in a letter in 1932, "For a number of reasons my trail has carried me farther and farther into Mexico, and I am finding so much to do there that I haven't found out much about California."[5] Thus Sauer left the search for historical clues regarding the evolution of San Felipe to future researchers, the present author included.

Historical evidence sometimes provides only the briefest of glimpses, mere hints toward a full explanation of the present condition of a place. Take one moment, for instance, in the history of San Felipe. In 1849, immigrants climbed slowly up from the desert into the Peninsular Ranges along the southern route to the California gold mines. A day before reaching Warner Ranch and turning north to Los Angeles and the Sierra Nevada, they encountered the lower reaches of San Felipe Valley, a grassy basin crossed by a willow-lined perennial stream that slowed to form an extensive cienega (marsh) before plunging down a canyon to the east. The diaries and journals of the forty-niners describe their arrival in San Felipe as a welcome relief after harrowing journeys through the Colorado Desert. "Three days of sunny road, and three nights of freezing cold, have brought us to San Felipe," wrote one traveler, "and a pretty valley it is… and sight of the trees gave us great pleasure, after the dearth of vegetation through which we have been passing."[6]

The argonauts' writings, describing brief stays in a tree-filled paradise, are snapshots of a specific time from a peculiar viewpoint, in a place with a complex and dynamic history. To give a full accounting of this history will require many more sources and multiple time scales. The longest time scale of history, one that allows insight into the things that all historical ages hold in common, is best represented by myth. Henry David Thoreau, as detailed later in this chapter, suggested that the truest story of a place – a recitation of its "entire poem" – is given by the myths that its residents construct.

Poetry is a particularly apt allusion in this context, for to write a history of nature and human interactions with it one must necessarily deal in metaphor. Nature, as Raymond Williams pointed out, is an idea with its own complex human history.[7] Nature

has at various times been viewed as a mechanism that can be predicted and controlled, an organism to be cared for and healed, or a community to join and influence.[8] Aldo Leopold, who made use of all three of these metaphors in his ecological writings, claimed that the community trope is essential to conservation policy. "We abuse land because we regard it as a commodity belonging to us," he wrote. "When we see land as a community to which we belong, we may begin to use it with love and respect."[9]

I undertake here the writing of a community history. I will try to broaden the familiar meaning of the phrase, and so will dwell for the first several pages on the meanings of each term, community and history. To call a natural place a community is to employ an intricate metaphor, for community is a word loaded nearly as heavily as nature itself. As described in this introductory chapter, in order to sketch the history of the San Felipe's natural community, I will draw on several distinct perspectives – those of scientific studies, of written and oral-historical sources, of visual texts, and of what may in fact be the truest voice for both nature and community, myth.

Community as an Ecological Idea

The ancient Greeks' conception of the *polis* seems to have determined much of their ethics, and consequently much of ours. The socioeconomic structure of the city-state, with its interdependence of rural and urban areas, led to great attention to duty and responsibility among its citizens. All members of the community had to fulfill their obligations in order to ensure the peace and greater happiness of the polis. Some authors have extended community membership to animals, which reach their highest potential in their own analogue of the polis – a well structured, fully functioning habitat.[10]

Not all commentators are comfortable with making such a direct analogy to community when speaking of the natural world. In the 1998 book, *Chance and Change: Ecology for Conservationists,* William Drury explains his unease with this extension of human ethics.

> The concept of natural communities as cooperating wholes may simply be a hopeful anthropomorphism based on the socioeconomic structure of Greek city-states. In contemporary use, "community" stands for a set of processes or rules that govern groups of interacting species. A central but unspecified tenet is that natural processes (from God's Creation, through an "unseen hand," to natural selection) bring out harmonies among coevolved community members.

Drury claims the characteristic modern insistence on "pervasive order" first "emerged when economic and cultural institutions removed influential thinkers from direct, daily, contact with nature," and that as a result the idea of a harmonious, interdependent natural community is a remote fiction with little or no correlation to the actual behavior of species.[11]

Drury's view is representative of that held by many ecologists of the last few decades. Though Frederic Clements's notions of orderly stages of succession and "climax communities" (along with various principles of equilibrium and stability as the rule in natural systems) remain pervasive in textbooks and heavily influence the worldview of conservationists and the general public, scientists have begun to emphasize the crucial role of unpredictable events such as fires and windstorms in determining species populations and distributions.[12] As Daniel Botkin asserts, "change appears intrinsic and natural at many scales of time and space in the biosphere…"[13]

If some ecologists are dissatisfied with the metaphor of a closed, interdependent community as applied to what they insist is an open-ended biological world, perhaps it is because the "community" they reject is a theoretically expanded yet not critically examined Greek polis. For critical examinations of the concept of community we must

turn to the field of ethnography, for while ecologists have been reconsidering the role of disturbance and chaos in determining the survival of species, social scientists and ethnographers have been redefining what is meant by "community" itself and reconsidering how to write about it.

Drawing from Ethnography

In addition to using the two root metaphors of organism and mechanism in relation to natural communities, scholars have applied them to describe human communities for centuries. The ethnographic technique of participant-observation has recently added several other possible root metaphors for human communities to scholarly discourse. The term "participant-observation" refers to a process in which an ethnographer participates in the daily routines of a community, developing ongoing relationships with its members, while observing and writing about what is happening.[14] If a student of a community is – even briefly or tangentially – also a community *member* the notion that he or she can draw conclusions from an omniscient, objective position is a contradiction. And participant-observers have difficulty envisioning themselves and others as cells or cogs. "The instruments of reasoning are changing," wrote Clifford Geertz in 1983, "and society is less and less represented as an elaborate machine or a quasi-organism and more as a serious game, a sidewalk drama, or a behavioral text."[15]

Game, drama, text. Like "body" and "machine" before them, each of these notions has its connotations and consequences. The use of game theory in sociology focuses attention on probability and the strategies of various "players" under specific limits or constraints.[16] Drama as a root metaphor for community leads to the use of the technical vocabulary of the theater – events can occur frontstage or backstage, for

instance. Finally, the application of "text" to social action involves, as Geertz puts it, "a particularly outlandish bit of 'seeing-as.'" Following Jacques Derrida's approach, every speech or gesture is seen as written text and terms such as coherence, inter-textuality, intention, reference, and meaning apply to all acts and behaviors.[17]

Calvin Martin extends the notion of participant-observation to the natural world by applying it to traditional American Indian metaphysics. "The Indian was a participant-observer of Nature," he writes, "whereas we in the Western cultural tradition tend to be voyeurs." In Martin's view the Indian's was the better position from which to learn about nature. "We may listen to Nature, but we cannot make out what it says. Our wilderness has become a proverbial Tower of Babel." What is today an unintelligible babble was once an articulate language of natural beings and spirits interacting in a community.[18]

Belonging to a community – natural communities included – is not necessarily a completely positive experience. "Community, we tend to think, is comfortable, pleasant, tame . . .," writes the ecological-restoration researcher, William R. Jordan III.

> What we overlook are the more troubling aspects of community – the challenge to the ego and even the identity of the individual that it entails, the imposition on others that is inseparable from community, and the loss of innocence that is the cost of membership in community.[19]

As anthropologists remind us, communities are not some unreachable ideal, communities "just are."[20] It is up to the researcher to find the most appropriate tools to study community; one of the most successful for the study of human community has been participant-observation. It is a tool, a way of thinking, ready for more use by those who study natural communities.

What the models resulting from participant-observation hold in common is that they describe communities that, to borrow a phrase from philosopher Albert Borgmann,

speak in "manifold and unforethinkable voices."[21] It is on this point that games, dramas, and multi-authored texts fundamentally differ from the metaphor of an organism, which would speak with only one voice, or that of a mechanism, which is easily predictable. The techniques of participant-observation have been applied almost exclusively to the study of human cultures, but Calvin Martin's use of the term reminds us that these methods have applications to nature-observation as well. If instead of bodies or machines we think of natural communities as games with multiple contestants, as dramas with ensemble casts, as a myriad of intertextual responses, or even as a complex communication among spirits, we replace monologue with discourse, and expectation with revelation and surprise.

Historiography

Given the complex implications of the metaphor of nature as community, we must carefully construct any history of changes in a natural community. Historical events, the philosopher Simon Blackburn points out, are "particular, dated, and unrepeated...."[22] To string these unrepeated events into a narrative, to make history of them, is to embed them into a pattern. Historians inevitably tell *stories* rather than list simple chronologies – history has form as well as direction.[23]

Thinkers from Plato to Arnold Toynbee have attempted to construct great systems of cyclical recurrence to explain the events of history, while others – from the authors of the Bible to Karl Marx – have countered with visions of inexorable, linear progression. Any pattern, whether cyclical or linear, has the advantage for the historian of making seemingly random events more comprehensible by placing them into a larger context.

Hegel, for instance, explained what may appear to be a chaos of competing ideas and creeds throughout history with his dialectic of thesis and antithesis, inevitably leading to a new synthesis, a new starting point from which society can progress further. Unfortunately, systematic philosophers of history too often insist that their systems can explain all of history, and here they make the fatal error of neglecting contrary evidence.

> They have forced facts into arbitrary classifications; given credence to the Single Cause; called into play the reductive fallacy – "this is nothing but – "; lost, in short, the imagination of the real, because of an overmastering desire for the one principle that will explain the career of mankind.[24]

If we can never hope to arrive at an overarching system of history, still it is a useful exercise to inquire into the basis of historical knowledge. How can we be sure of what happened in the past? One crucial question for the historian is that of the appropriate scale of time to use. While physicists measure time in a lockstep progression of uniform increments – asserting in a classically mechanical, circular definition that time is the quantity measured by clocks – for historians of communities a view of time as more malleable and contingent may be required to provide the proper context for events.

The philosopher Henri Bergson constructed such a contextual view of time, comparing the way we live through time to the way we experience cinema. If events are a succession of unique images – the frames of a film – perhaps historians can still discern the end of one scene from the start of another. As we shape the story of the past, said Bergson, our innate sense of *duration* helps us to sort the intermingling and mixture of actions.[25]

The historian Fernand Braudel proposed a three-tiered time scale for historians to apply in order to elucidate the full story of a place. Braudel broke history down into scales of (1) political time, or *l'histoire événementielle,* the history of particular events; (2) socioeconomic time, or *la vie matérialle,* "a history of gentle rhythms, of groups and

groupings;" and (3) geographical time, or *longue durée,* "a history that is almost changeless, the history of man in relation to his surroundings."[26] *Longue durée,* perhaps the best scale for environmental history, is also the time scale within which morality and myth develop. "Myths," wrote Braudel, "… correspond to structures of extremely long duration."[27]

Dave Egan and Evelyn A. Howell have suggested that the proper era for historical ecology to consider is the Holocene, the ten thousand years that have elapsed since the last ice age, a time period appropriate for the application of Braudel's *longue durée* and perhaps the longest useful time scale for ecologists and ecological restorationists. Among other reasons for choosing the Holocene, Egan and Howell assert, "[I]t is the period in which all of humanity's recorded history (both oral and written) exists."[28] While a psychologist may find the basis for human desires and actions in deeper reaches of the past, to ask a historian what happened before the Holocene is to ask a question that lies outside the boundaries of the field and so is for most purposes meaningless. We may as well ask an anthropologist about humanity's ancestors among the dinosaurs, or a geologist about what was happening on Earth while the sun was forming.

Daniel Boorstin emphasizes that myth arises as a community oral tradition. Because myth develops slowly it is the natural vehicle to explain origins. Because it is the product of a multitude of authors it gives voice to universal themes. Literacy can lead to a poverty of myth, as the emphasis on origins, universality, and the poetry of speech gives way to the written endeavors of inquiring individuals.[29]

Boorstin writes that in ancient Greece historians such as Thucydides and Herodotus turned from the "imagination of poets and the speculations of philosophers" to

"the prosaic facts of experience." "While myths explain origins – how things began – history would explain consequences. Historical thinking is teleological."[30] While myth asks, whence did we come?, history asks, where did we go? The answer comes in the form of a story, and stories flow only as we direct them. As Braudel pointed out, narrative history is not merely a form of history; it constitutes a full philosophy of history.[31]

The form of a story, as opposed to that of simple chronology, is what distinguishes environmental history from a listing of geological epochs or a recounting of evolutionary changes in species. William Cronon writes that for the historian, "a tale of environmental change must be structured so that, as Aristotle said, it 'has a beginning, middle, and end.'"[32] Cronon points out that each story also has a plot or theme. The stories of environmental history inevitably focus either on declension – i.e., the decline of natural ecosystems – or on the progress of creative human adaptation to environmental constraints.

But there are other – some would say more complete – ways of constructing the past than writing it. Boorstin recounts Socrates' distrust of writing as a way of knowing. "As Socrates explained (in Plato's *Phaedrus*), just as the painting, unlike the living person, cannot respond to questions, so too the written word is lifeless."[33] The act of writing can remove one from participation, leading more easily to a position of detached irony and the illusion of existing outside of events.

Today similar issues confront scholars who write environmental histories, and particularly those who attempt to include the perspective of American Indian peoples. John Miles Foley writes that the multi-step process of publishing oral histories –

inscription, transcription, interpretation, and translation – magnify the distortions of the original event that are inevitable whenever history is analyzed and retold.

> Gone are all of the performance parameters (voice, music, gesture), gone is the interactive audience and its participatory influence, gone is the network of indigenous-culture knowledge and belief that informs and quickens any verbal event by implication. The performance of verbal art, now repackaged for ready consumption by modern Western cultures, has become but a dim shadow of itself.[34]

Richard White claims that in writing the history of Indian peoples and their interactions with the natural world, modern historians are limited from the outset since they are "prisoners of the documents" and until recently, historical documents have nearly always been produced by non-Indians.[35] In the same volume, Angela Cavender Wilson argues that historians have to overcome the difficulties: "To truly gain a grasp of the field of American Indian history, native sources must be consulted."[36] Wilson, Foley and others suggest that in order to mitigate the distortions of transcribing oral texts, scholars should collaborate with performers and culture-bearers during all stages of the research process.[37] If the documents imprison historians, perhaps we can plot a jailbreak, or at least increase the dimensions of our prison cells by broadening notions of what constitutes a document.

The composition of full environmental histories requires that we use multiple time scales combined with careful analysis and interpretation. "Deconstruction is, in a sense, what historians have done for a considerable time," White writes. "We look for assumptions; hidden threads of connections; we probe for absences."[38] In order to reconstruct a landscape, environmental historians use conventional historical methods and also consult local tradition, ethnohistories, archaeology, glottochronology, and such scientific techniques as dendrochronology, pollen studies, repeat photography, and GIS mapping. Relevant historical evidence may include paintings, photographs, artifacts,

maps, dance, song, chants, legal documents, missionary reports, trader's records, military journals and correspondence, newspaper articles, and even the ecological and geographical changes that can be read directly from the land itself. "The best way for a modern historian to bring [an ecological] perspective to the land," according to William Cronon, "is to get out and walk the landscape: no amount of library work can replace the field experience gained by exploring different habitats as they exist today."[39]

The Example of Thoreau

Henry David Thoreau used many of the techniques of what we now call historical ecology a century and a half ago. Thoreau, whose stated ambition was to reconstruct "the actual condition of the place where we dwell, three centuries ago," provides a cogent example for anyone with similar goals today, and it is worth devoting space here to examine his methods. His writing and intense observational skills fed each other until he reached that point where he could "read" stories directly from his surroundings. He could read a story of landscape evolution in a stand of white pines, and decode population dynamics in the rings on tree stumps. "Had he lived longer," speculates Donald Worster, "perhaps Thoreau would have drawn from these techniques a complete chronicle of man's occupation, use, and misuse of this small New England habitat."[40]

While Thoreau's literary ambitions may have included the completion of such a chronicle, they comprised much more. As the following extract from his journal indicates, he took the metaphor of nature as book quite seriously.

> I take infinite pains to know the phenomena of the spring, for instance, thinking that I have here the entire poem, and then, to my chagrin, I hear that it is but an imperfect copy that I possess and have read, that my ancestors have torn out many of the first leaves and grandest passages, and mutilated it in many places. I should not like to think that some demigod had come before me and picked out some of the best stars. I wish to know an entire heaven and an entire earth.[41]

In his book *Changes in the Land* William Cronon takes Thoreau to task over these ideas. "However we may respect his passion, we must also recognize its limits," writes Cronon. "[W]e can never share his certainty about the possibility of knowing an entire heaven and entire earth. Human and natural worlds are too entangled for us, and our historical landscape does not allow us to guess what the 'entire poem' of which he spoke might look like. To search for that poem would in fact be a mistake."[42]

Here Cronon may not credit Thoreau with enough care in his use of the word "poem," for it is precisely the "historical landscape" that Thoreau was working to transcend. If Thoreau were interested only in reconstructing a chronology, or even a straightforward declensional history, Cronon would be justified in his criticisms. But the intense thought and observation Thoreau directed to his surroundings led him to see the limitations of conventional discourse about nature. Thoreau doubted the adequacy of history to give a full accounting of the environment. He reached instead for the symbolism of myth – with its inherently long time scale – and poetry in order to do justice to the task. H. Daniel Peck writes that although Thoreau read history "in order to recover a sense of primary contact with the past," he believed that "the historian's view is severely limited" and that "history obstructs an original relation to the universe by supplanting the eternal with the merely transient." According to Peck, Thoreau believed that historians tended to distort and omit too much from their accounts in order to advance their own points of view, and that as a result adequate histories of some groups, such as American Indians, had not been written.[43]

By the summer of 1840 Thoreau had begun to articulate the notion in his journal that myth offered the best description both of nature and of the human response to its

mysteries: "I do not know where to find in any literature, whether ancient or modern, any adequate account of that nature with which I am acquainted. Mythology comes nearest to it of any."[44] He was to become a careful, almost obsessive naturalist, but he never lost sight of the idea that, as Thoreau biographer Robert D. Richardson Jr. puts it, "the writer who aspires to a language adequate to nature must be able to link fact with myth."[45] Thoreau continually employed myth in order to explain what he observed in nature, and the human place in nature. "Calling myth a version of history and an approach to universal language, Thoreau looks to myth for a way to express the nature he experiences," writes Richardson.[46] As Thoreau himself put it, "Mythology is ancient history or biography."[47]

Even fact-gathering and categorization of observations, usually the provinces of science and rational thought, take on mythic meaning in Thoreau's hands: "A fact truly and absolutely stated is taken out of the region of common sense and acquires a mythologic or universal significance . . .. Express it without expressing yourself."[48] Richardson suggests, ". . . by concentrating on those aspects of nature common to all eras, i.e. the laws, [Thoreau] dechronologizes history . . . "[49] As a naturalist searching for the broad natural laws implied by specific observations, he linked the facts he gathered to philosophy, poetry, and myth.

Thoreau paid close attention to the most appropriate language in order to make these links. "Popular language, and even more the language of the American Indians, reflected the living, organismic world far better than did the jargon of science," writes Worster.[50] Thus Thoreau included in *The Maine Woods* a list of "Indian Words" that he learned from his Penobscot guide, Joe Polis.[51] The famed plant scientist Liberty Hyde

Bailey, who believed that knowing the scientific, Latin-binomial names of plants deepens one's connections with past botanists, once remarked, "To know the names of plants is one of the keenest of satisfactions; it brings one into relationship with living things, in endless variety; it multiplies the contacts."[52] Thoreau was interested in knowing indigenous names for similar reasons; he wished to multiply the contacts between himself and the natural world.

In his combination of universal myth and local detail, and of both the human and the greater community, Thoreau produced writings that seemed to contradict each other. Worster suggests that these apparent inconsistencies were the inevitable result of the scale of Thoreau's thought:

> It has been amply demonstrated that he was a man of contrary moods, especially in his vacillation between pagan naturalism and a transcendental moral vision. What remains is to suggest is that these polarities could become complementary views rather than simple opposites.[53]

Quoting such epigrams as, "I love the wild not less than the good," and, "Nature works by contraries," Worster argues that Thoreau was working through "the concept of the dialectic." Perhaps *pluralectic* would be a term we could coin to apply to his work, for Thoreau's view of nature in fact had myriad dimensions. The result was not a soft-focus vision, but one formed from within a house of prisms – a unique set of multiple images of various angles and wavelengths – a record, sketchbook, and calendar of New England like no others. Such are the types of records to which historical ecologists aspire today.

Science, History, and Culture

A century after Thoreau, ecological scientists still sought a timeless order in nature, asserting that ecosystems progressed through predictable stages to "climax

conditions" of maximum balance and stability. History and the humanities, meantime, had developed contrasting ideas of an unstable world. In the wake of the Holocaust, nuclear horrors, and large-scale political turmoil, human history seemed emphatically disorderly, even if the history of nature still seemed to tend toward orderly arrangement. By the late twentieth century, however, even ecology had come to a historical, contingent view of change over time. Donald Worster, in his essay "Disturbing Nature," writes:

> All history has become a record of disturbance and that disturbance comes from both cultural *and* natural agents, including droughts, earthquakes, pests, viruses, corporate takeovers, loss of markets, new technologies, increasing crime, new federal laws, and even the invasion of America by French literary theory.[54]

This leaning toward an emphasis on change over time, and away from the idea of timeless order, is a crucial distinction between what scholars long termed the "primitive" or "savage" mind and the view of late modernism. Worster quotes Claude Levi-Strauss: "the characteristic of the savage mind is its timelessness; its object is to grasp the world as both a synchronic and diachronic totality."[55]

Historian Richard White is deeply suspicious of recent attempts, such as those of Calvin Luther Martin, to bring ancient American Indian philosophy to bear on modern environmental problems. "This whole environmentalist position of asserting that different beliefs will yield purer actions is questionable," writes White. "The belief that we might literally borrow the worldview of selected Indian peoples seems but a deformed child of functionalism." White urges less emphasis on ancient traditions, and more inclusion of "Indians who speak… for compromised, contemporary Indian communities" in environmental discourse.[56]

Some writers draw on both traditional and modern sources. One example is Gary Paul Nabhan, who calls attention to the "cultural parallax" that occurs when indigenous

and mainstream views of wildlands conservation are contrasted. As Nabhan describes it, indigenous conservation evolves over time in response to local environmental conditions. Mainstream conservation, on the other hand, assumes that all people "view and use wildlands in the same manner." Thus worldviews depend upon whether people are participants in natural communities or only observers: "cultural parallax… might be considered the difference in views between those who are actively participating in the dynamics of the habitats within their home range and those who view those habitats from the outside."[57]

Toward Restoration

If conservation is understood as the maintenance of dynamic relationships among human beings and their surroundings, then ecology is not a complete science unless it includes a consideration of all aspects of this relationship. Among these aspects are cultural considerations – including economics, aesthetics, and myths or stories about the land. If ecology is the study of so many facets, then ecological restoration must also be broadly defined. According to Nabhan,

> We are learning of the need to restore not only the physical aspects of the habitats but also the cultural commitment to protect, to heal, to let the wildness of living communities continue to evolve… To restore any place, we must also begin to re-story it, to make it the lesson of our legends, festivals and seasonal rites… By replenishing the land with our stories, we let the wild voices around us guide the restoration work we do. The stories will outlast us.[58]

As restorers slowly move toward the realization that what they are restoring is an encompassing mythological *relationship* to a place, the criteria for success change from those for simple reproduction of the conditions of a specific time in history to a focus on

the process of the work itself. Kenneth Brower has recently written of early restoration efforts:

> The restorationists quickly encountered a core problem of restoration: authenticity. Rehabilitation of land is one thing; *recapitulation* is another… It dawned on the restorationists, as it dawns on most artists, scientists, mathematicians, that the end-product of their work – the restored prairie, marsh, or woodland – was no more important than the process of arriving there. The best way to learn how a marsh or prairie works, it turns out, is to attempt to restore it.[59]

The best way to study ecology, in other words, is to actively engage in the living community.

Some ecologists have backed off the word "restore" in recent years, suggesting alternatives: re-create, rehabilitate, reestablish, redevelop, reclaim, reconstruct, replace, or reallocate. Mark K. Briggs uses the term *recovery* as a catchall to describe any attempt to "improve the condition of degraded … ecosystems."[60] Historian Dan Flores broadens the restoration idea further, indicating that what may be restored along with species and ecosystems is an optimistic feeling that once resided in the land – Wallace Stegner's "geography of hope." Flores tempers any optimism, though, by pointing out that the process of restoration is surrounded by difficult questions – political and otherwise – and concludes with an old historians' saying: "What happens next is going to be awfully interesting."[61] The biologist and law professor Holly Demerus writes that restoration is fraught with difficulty because it represents a collision between two fundamentally opposed worldviews.

> On one side the environmentalists of the new West seek a paradise where nature represents an awesome presence, an intricate and beautiful dance to be admired and respected in its own right. These advocates of wild nature measure choices against the standards articulated by Aldo Leopold: Things are morally right if they tend to preserve the integrity and beauty of nature; they are morally wrong if they tend otherwise. On the other side are the ranchers, loggers and miners of the old West, seeking to preserve the western utopia their forebears created through arduous labor and single-minded determination. Their Eden is a garden in which nature has been tamed, stripped of its wildness in order to maximize its utility as the servant of humankind.[62]

Though it certainly won't be an easy one, perhaps there is a way out of the conundrum of restoration vs. the utility of nature. We can make ecology into a more complete study of place, and widen the focus of our conservation efforts to include the restoration of proper human participation in the wild. Ecological restorationists inquire about the original state of affairs – about *nature* – in a certain place. They are interested, really, in philosophical sorts of questions: what is natural, and how can we work with nature to become what it is good to become? The answers are all around us, but in order to find them we will need work together, as well as be perceptive, intensely observant, and open to participate in the unique specifics of each place.

People's conceptions of nature have practical consequences; we order the world to conform to them. The rub is that people's conceptions of nature vary quite a bit, and sometimes we have a difficult time understanding each other and doing justice to these competing views. Wendell Berry has written that the natural world is currently composed of "punishments and ruins."[63] The punishments must simply be endured, but the ruins need not remain simply as perpetual reminders of what has been lost. From the remains of ancient Greece and Rome, medieval Europe fashioned the Renaissance. What happens next with the remnants of indigenous America is going to be awfully interesting.

The Great Community

Berry may understand the ecological model of community as well as any contemporary writer. He has written a series of novels and short stories about a rural Kentucky community – human and natural – that he calls the "Port William membership." His use of that word, membership, has its roots in the writings of St. Paul,

and is related to philosopher Josiah Royce's concept of the "great community," a term also used by Berry's teacher, Wallace Stegner.

In *The Philosophy of Loyalty,* Royce called for small, local communities to develop a

> new and wiser provincialism… which makes people want to idealize, to adorn, to educate, their own province: to hold sacred its traditions, to honor its worthy dead, to support and multiply its public possessions.[64]

Royce looked to Buddhism and Christianity, and especially to St. Paul, for lessons in community. He wrote, "The often misunderstood heart and essence of the Pauline vision of charity is that it is a vision belonging to a community." When Paul wrote to the Ephesians, "We are members of one another," his conception of an interdependent community comprised only Christians, living as one in the spirit of Christ. Royce extended this idea from the church to the "universal community" – a loose collection of distinct, local communities, forming a "great community" of diverse, respectful people who are aware of their interdependence.[65]

Stegner elaborated on Royce's conception of community in a speech, "The Book and the Great Community," given at the dedication of the University of Utah's library in 1968. He expressed admiration for Royce's ideas and their connection to Pauline charity, emphasizing that the great community includes the work of past scholars and artists, and that when we read their books, they also become members – parts – of us.[66] To books we can surely add oral tradition and mythology. When we hear the stories – and participate in them – they become part of us and us of them.

Berry's depiction of Port William brings together the two essential characteristics of the great community – membership and history – and adds a third to the mix: the role of the land. As his character Burley Coulter says, "The way we are, we are members of

each other. All of us. Everything. The difference ain't in who is a member and who isn't, but in who knows it and who don't."[67] Berry's inclusion of the word "everything" extends membership in the great community beyond humans.

Allegory, Salvage, and Restoration of the Great Community

James Clifford has written that all ethnographic writings are allegories. When an oral-discursive experience is inscribed, that experience is necessarily distorted and shaped into an allegorical structure. As Clifford notes, the very practice of converting experience to text has often implied an allegory of "salvage;" non-Western cultures have been portrayed by ethnographers "as fragile, threatened, and transient," saved for posterity only through academic publication.[68]

But Clifford claims that pessimistic, salvage-oriented views of cultural life are not inevitable in ethnography. Making an analogy to pastoral, which "frequently involves a *critical nostalgia,* a way… to break with the hegemonic, corrupt present by asserting the reality of a radical alternative," he calls for an ethnography and a history that describe processes not of "irresistible decay" but of "inventive life."[69]

Following Clifford's lead, one would think that similar analogies could be made to ecological restoration, which can be viewed not as a quixotic attempt to completely recover a lost, happier past but rather as a demonstration of alternatives for the future. Restorers may gain a full picture of the scope of their work by framing ecological restoration as part of the larger task of seeing a particular place as a great community, a place possessing both history and mythology, perhaps even a local language, a

community to which the restorer belongs. Through careful consideration of records of the past and a reflective participation in human and natural community one might be able to lead an inventive life and help to resist a process of decay.

Getting to Know San Felipe Valley's Poem

Thinking historically while eschewing systematization is possibly something that can only be done badly. But we won't know until we try it.[70]
-- *Louis Menand*

"By some accounts," Marcus Hall recently remarked, "students are departing from their environmental history courses with greater senses of gloom and despair. After all, decline, not progress, prevails in the stories told about humans changing the land… But such histories do not tell the entire tale."[71] This master's thesis suggests a framework for doing justice to the entire tale – Thoreau's "entire poem" – of San Felipe Valley, and for using this poem to counter gloom and despair.

The following chapters will consider various types of evidence in an attempt to sketch out San Felipe's poem. The evidence falls into three broad categories: science, history, and myth.

Science (Chapter 2): Scientists wish to describe the physical and biological processes of San Felipe. Which species and subspecies are present, and in what proportions? How do they interact? How do these species adapt to the specific conditions of the place? What are the population trends, and their causes? The tests of truth for the answers to these questions are mathematical – an ecologist's "confidence" is a statistically determined quantity. A great deal of quantitative study remains to be

completed, but to this point observations in San Felipe Valley show it to be an extraordinarily diverse area by numerous criteria. New species, recently bird species in particular, are being observed in San Felipe frequently. The entire area seems to be an ecotone, a meeting ground for plants and animals usually associated with distinct biomes.

History (Chapter 3): History – that is, documentary and oral history, as distinct from oral tradition and myth – takes a different view of facts and truth. Stories constructed by historians are not tested mathematically; they are determined to be true or false by examining and cross-referencing sources that form an entire network of evidence. While any number of stories can be constructed from the same set of sources by emphasizing particular aspects of the evidence, the test of historical truth lies in the thoroughness and consistency of the narrative produced.

The story of San Felipe told through written and oral-historical sources in this thesis is a declensional one regarding human ability to manage surface water and forage in the valley. Water and grass flourished during the indigenous regime and declined under the aegis of Euroamericans. My view of changes in riparian vegetation in the valley and Sentenac Cienega and Canyon is more ambivalent; more data are needed, but it is clear that streamside vegetation and its dependent animal life have shifted in terms of composition and structure since prehistoric and protohistoric times. While tamarisk and other exotic species have gained footholds and native species have undoubtedly been extirpated, it is unclear whether the overall variety of native riparian species has increased or decreased over time.

Myth (Chapter 4): Though myth is often dismissed as a generally held fiction, from another perspective myths are by definition true. Any tale told generation after

generation to listeners who react to, modify, and retell it contains community-determined symbolic, imaginative, or moral truths. To assert that myths are true in this sense is to advance a near tautology. Pervaded by an indigenous sense of "power," San Felipe-area myths describe plants, animals, and fire as full members of the local community.

Finally, Chapter 5 attempts, or begins to attempt, a synthesis of the three general approaches of the three previous chapters. This concluding chapter also describes my work – in collaboration with public school students and other members of my local community – on the beginnings of a restoration program in San Felipe, along with thoughts on prospects for future work.

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[1] Fernand Braudel, *On History,* trans. Sarah Matthews (Chicago: The University of Chicago Press, 1980), 4.

[2] Ronald F. Lockmann, compiler, "About the Author," in Henry J. Bruman, *Alcohol in Ancient Mexico* (Salt Lake City: The University of Utah Press, 2000), 145.

[3] Michael Edmonds, "The Pleasures and Pitfalls of Written Records," in Dave Egan and Evelyn A. Howell, eds., *The Historical Ecology Handbook: A Restorationist's Guide to Reference Ecosystems* (Washington, D.C.: Island Press, 2001). Edmonds cites the following works of Carl Sauer's as examples of syntheses of historical data: *The Early Spanish Main* (Berkeley: University of California Press, 1966); *Northern Mists* (Berkeley: University of California Press, 1968); *Sixteenth-century North America: The Land and People as Seen by Europeans* (Berkeley: University of California Press, 1971; and *Seventeenth-century North America* (Berkeley: Turtle Island Press, 1980).

[4] Carl Sauer, "Land Forms in the Peninsular Range of California as Developed about Warner's Hot Springs and Mesa Grande," *University of California Publications in Geography,* Vol. 3, No. 4 (1929), 201.

[5] Carbon copy of letter, 26 August 1932, from Carl Sauer to John Treanor, Carl Sauer Papers, BANC MSS 77/170 c, The Bancroft Library, University of California, Berkeley.

[6] John W. Audubon, "San Felipe to Santa Ysabel Route: The Journal of John W. Audubon," in George M. Ellis, ed., *Gold Rush Desert Trails to San Diego and Los Angeles in 1849* (San Diego, Calif.: Brand Book Number Nine, San Diego Corral of the Westerners, 1995), 89.

[7] Raymond Williams, "Ideas of Nature," in *Problems in Materialism and Culture: Selected Essays* (London: Verso, 1980), 67.

[8] A comprehensive treatment of the evolution of the idea of nature up to the nineteenth century is given by Clarence J. Glacken, *Traces on the Rhodian Shore: Nature and Culture in Western Thought from Ancient Times to the End of the Eighteenth Century* (Berkeley and Los Angeles: University of California Press, 1967). Other sources that discuss Western metaphors of nature include Daniel B. Botkin, *Discordant Harmonies: A New Ecology for the Twenty-first Century* (Oxford: Oxford University Press, 1990) and Carolyn Merchant, *The Death of Nature: Women, Ecology and the Scientific Revolution* (San Francisco: Harper & Row, 1989).

[9] Aldo Leopold, *A Sand County Almanac* (New York: Oxford University Press, 1968), viii.

[10] See John Herman Randall, Jr. and Justus Buchler, *Philosophy: An Introduction* (New York: Barnes & Noble, Inc., 1960), 259-60.

[11] William Holland Drury, Jr., *Chance and Change: Ecology for Conservationists* (Berkeley and Los Angeles: University of California Press, 1998), 20; 12-13.

[12] For a discussion of Clements's ideas and their effects on the science of ecology, see Donald Worster, *Nature's Economy: A History of Ecological Ideas,* 2d ed. (Cambridge: Cambridge University Press, 1994).

[13] Botkin, *Discordant Harmonies*, 10.

[14] Robert M. Emerson, Rachel I. Fretz, and Linda L. Shaw, *Writing Ethnographic Fieldnotes* (Chicago: The University of Chicago Press, 1995), 1.

[15] Clifford Geertz, *Local Knowledge: Further Essays in Interpretive Anthropology* (New York, Basic Books, 1983), 23.

[16] Given what Robert F. Heizer and Albert B. Elsasser call the "extraordinary localism" of indigenous California tribes, perhaps game theory could provide a particularly apt approach to studying the community history of San Felipe Valley. The historian Fernand Braudel made analogies to mathematics when discussing the various approaches to social science – the traditional approach, which deals with "given facts" and their consequences, the probabilistic approach, which concerns "contingent facts" and leads to the smooth curves and predictions of economics, and finally game theory, which studies the "conditioned facts" of specific constraints and rules, and attempts to takes into account all possible relationships and strategies among a local set of players. See Heizer and Elsasser, *The Natural World of the California Indians* (Berkeley and Los Angeles: University of California Press, 1980), 203, and Braudel, *On History,* 42.

[17] Geertz, *Local Knowledge,* 23-24

[18] Calvin Martin, "The Metaphysics of Writing Indian-White History," in Martin, ed., *The American Indian and the Problem of History* (New York: Oxford University Press, 1987), 27-34.

[19] William R. Jordan III, "Restoration, Community, and Wilderness," in Paul H. Gobster and R. Bruce Hull, eds., *Restoring Nature: Perspectives from the Social Sciences and Humanities* (Washington, D.C.: Island Press, 2000), 34.

[20] Riall W. Nolan, *viva voce* remark at Prescott College Master of Arts Program Colloquium, February 8, 2002.

[21] Albert Borgmann, "The Nature of Reality and the Reality of Nature," in Michael Soulé and Gary Lease, eds., *Reinventing Nature?: Responses to Postmodern Deconstruction* (Washington, D.C.: Island Press, 1995), 31-46

[22] Simon Blackburn, *The Oxford Dictionary of Philosophy* (Oxford: Oxford University Press, 1994), 174.

[23] Discussions of causation and narrative in history are offered by Jacques Barzun and Henry F. Graff, *The Modern Researcher,* 3rd ed. (New York: Harcourt Brace Jovanovich, Inc., 1977), 142-46, and, with an emphasis on environmental history, William Cronon, "A Place for Stories: Nature, History and Narrative," Journal *of American History,* 78 (March 1992), 1347-1376.

[24] Barzun and Graff, *Modern Researcher,* 165.

[25] Daniel J. Boorstin, *The Seekers: The Story of Man's Continuing Quest to Understand His World* (New York: Random House, 1998), 247-48.

[26] Braudel, *On History,* 3-4.

[27] *Ibid.,* 45-46

[28] Dave Egan and Evelyn A. Howell, "Introduction," in Egan and Howell, eds., *The Historical Ecology Handbook: A Restorationist's Guide to Reference Ecosystems* (Washington, D.C.: Island Press, 2000), 17.

[29] Boorstin, *Seekers,* 124.

[30] *Ibid.,* 116-17.

[31] Braudel, *On History,* 4, 11.

[32] Cronon, "A Place for Stories," 1365.

[33] Boorstin, *Seekers,* 33.

[34] John Miles Foley, "Foreword," in Larry Evers and Barre Toelken, *Native American Oral Traditions: Collaboration and Interpretation* (Logan, Utah: Utah State University Press, 2001), viii.

[35] Richard White, "Indian Peoples and the Natural World: Asking the Right Questions," in Donald L. Fixico, ed., *Rethinking American Indian History* (Albuquerque, N.M.: University of New Mexico Press, 1997), 93.

[36] Angela Cavender Wilson, "Power of the Spoken Word: Native Oral Traditions in American Indian History," in Fixico, ed., *Rethinking American Indian History*, 101.

[37] Foley, "Foreword," viii.

[38] White, "Indian Peoples," 93.

[39] William Cronon, *Changes in the Land: Indians, Colonists, and the Ecology of New England* (New York: Hill and Wang, 1983), 211. For a detailed list of types of ethnohistorical evidence, refer to James Axtell, "The Ethnohistory of Native America," in Fixico, ed., *Rethinking American Indian History*, 18-19.

[40] Worster, *Nature's Economy*, 72.

[41] Quoted in *Ibid.,* 66.

[42] Cronon, *Changes in the Land*, 15.

[43] H. Daniel Peck, *Thoreau's Morning Work: Memory and Perception in* A Week on the Concord and Merrimack Rivers, *the Journal, and* Walden (New Haven, Conn.: Yale University Press, 1990), 16-17.

[44] Quoted in Frederick Turner, *Beyond Geography: The Western Spirit Against the Wilderness* (New York: The Viking Press, 1980), 270.

[45] Robert D. Richardson Jr., *Henry Thoreau: A Life of the Mind* (Berkeley and Los Angeles: University of California Press, 1986), 135.

[46] *Ibid.*, 182.

[47] *Ibid.*, quoted on 185.

[48] *Ibid.*, quoted on 251.

[49] *Ibid.*, 158.

[50] Worster, *Nature's Economy,* 92-93.

[51] Henry D. Thoreau, *The Maine Woods* (Princeton, N.J.: Princeton University Press, 1972), 320-23.

[52] L. H. Bailey, *How Plants Get Their Names* (New York: Dover Publications, 1963), 27.

[53] Worster, *Nature's Economy,* 107.

[54] *Ibid.*, 424.

[55] *Ibid.*, 426. Given this definition, perhaps we can say that Thoreau tried to attain a savage mindset.

[56] Richard White, "Environmentalism and Indian Peoples," in Jill Ker Conway, Kenneth Keniston, and Leo Marx, eds., *Earth, Air, Fire, Water: Humanistic Studies of the Environment* (Amherst, Mass.: The University of Massachusetts Press, 1999), 127, 130, 141.

[57] Gary Paul Nabhan, *Cultures of Habitat: On Nature, Culture, and Story* (Washington, D.C.: Counterpoint, 1997), 158-159.

[58] *Ibid.*, 319.

[59] Kenneth Brower, "Leopold's Gift," *Sierra,* Vol. 86, No.1 (January/February, 2001), 30.

[60] Duncan T. Patten, "Restoration as the Order of the 21st Century: An Ecologist's Perspective," in Robert B. Keiter, ed., *Reclaiming the Native Home of Hope: Community, Ecology and the American West* (Salt Lake City: The University of Utah Press, 1998), 69; Mark K. Briggs, *Riparian Ecosystem Recovery in Arid Lands: Strategies and References* (Tucson: The University of Arizona Press, 1996), 12.

[61] Dan Flores, "Making the West Whole Again: A Historical Perspective on Restoration," in Keiter, *Reclaiming the Native Home.*

[62] Holly Doremus, "Private Property Interests, Wildlife Restoration, and Competing Visions of a Western Eden," in Keiter, *Reclaiming the Native Home.*

[63] Wendell Berry, "A Few Words in Defense of Edward Abbey," in *What Are People For?* (San Francisco: North Point Press, 1990), 47.

[64] Josiah Royce, *The Philosophy of Loyalty* (New York: The Macmillan Company, 1908), 245-246.

[65] Josiah Royce, *The Hope of the Great Community* (Freeport, New York: Books for Libraries Press, Inc., First published 1916; reprinted 1967), 34.

[66] Wallace Stegner, "The Book and the Great Community," in *The Sound of Mountain Water* (Garden City, New York: Doubleday & Company, Inc., 1969), 276-286.

[67] Wendell Berry, *The Wild Birds* (San Francisco: Northpoint Press, 1983), 136-137.

[68] James Clifford, "On Ethnographic Allegory," in Clifford and George E. Marcus, eds., *Writing Culture: The Poetics and Politics of Ethnography* (Berkeley and Los Angeles: The University of California Press, 1986), 114.

[69] *Ibid.*, 114, 119.

[70] Louis Menand, "Modernity and Literary Theory," in Conway, Kenniston, and Marx, eds., *Earth, Air, Fire, Water,* 319.

[71] Marcus Hall, "Repairing Mountains: Restoration, Ecology, and Wilderness in Twentieth-Century Utah," *Environmental History,* Vol. 6, No. 4 (October 2001), 584.

Chapter 2

Favorite Collecting Grounds: San Felipe Valley's Physical and Living Environment

"The state of drainage peculiar to a country seems to establish principally the existence of one or the other species of those ruminants, which are indigenous to the regions adjacent to the boundary line."

"Thus, the common deer belongs to the more shady lowlands, the mule deer to the uplands; the antelope ranges over the open mountain table lands, whilst the mountain sheep has its home over the rugged crests of the waterless sierras of northwestern Sonora and New Mexico."

-- Arthur Schott,
in William H. Emory's *Report on the United States and Mexican Boundary Survey*, 1859.

From its source to the head of Sentenac Canyon, a distance of some thirteen miles, San Felipe Creek flows through an area of diverse habitat types. The creek's watershed includes in close proximity habitat for three of the species noted by Arthur Schott in the epigraph above: mule deer, bighorn sheep, and even pronghorn, though the latter has been extirpated from the San Diego region since the early twentieth century. The valley's striking array of landforms and microhabitats has attracted a corresponding diversity of scientists over the years; the area is a familiar haunt for geologists as well as botanists, lepidopterists, herpetologists, ornithologists, and other biologists.

Rocks and Water

The extraordinary diversity of San Felipe Valley's life forms is rooted in an equally extraordinary variation in landform. The spatial scale of the processes that have shaped the area exhibit a huge range, from gargantuan to microscopic, and their durations

can be nearly instantaneous or imperceptibly slow. On a large scale, massive movements along earthquake faults have shaped the valley. On smaller scales physical and chemical weathering slowly breaks down rock into fine particles that erode away slowly or in a flash of water or wind; debris may creep downslope over a period of years or roar down in a sudden landslide. Living organisms have also shaped the landscape: humans erode soil by ranching, farming, and building; plant roots crack open boulders; animals burrow through and aerate the soil; and microorganisms slowly deposit thick layers of calcareous tufa on the rocks along San Felipe Creek.[1]

The Colorado Desert is a relief desert, meaning that its lack of precipitation results from the rain shadow cast by the steep escarpment of the Peninsular Ranges.[2] San Felipe Valley offers a rare gradual ascent through the mountains, starting from Sentenac Cienega at 2, 224 ft. and reaching the coastal-desert divide of Teofulio Summit at the relatively low elevation of 3686 feet. San Felipe is a broad, generally flat, well-watered, southeast-tending valley, running parallel to California's coastline. Two fault zones determine the shape and orientation of the valley. One of these fault zones runs NW-SE along the length of the valley. The activity in this fault zone has created structural weaknesses that are particularly susceptible to the erosive force of water. With each rain, more material washes away and the valley deepens. Thus San Felipe is known as a fault-controlled valley.[3] The second fault zone takes a perpendicular course, extending through Banner and Sentenac canyons and crossing San Felipe Valley at its greatest breadth.[4]

Volcan Mountain, a rising mountain block,[5] forms one of the valley's margins. Volcan and other mountain ranges in the area are mostly granitic – composed of a formation called a "batholith," meaning "deep rock" – along with some sedimentary and

"mixed" rock, or migmatite.[6] 500 million years ago a sea covered the area.[7] One of the area's characteristic formations, the gold-bearing Julian Schist, consists of metamorphic rocks formed from shoreline carbonate deposits, 200-225 million years old.[8] Narrow bands of light-colored rock called pegmatite dikes formed during explosive intrusions into fissures in the surrounding batholith, in a process called contact metamorphosis.[9] The pegmatite is a particularly rich source of gems;[10] W.P. Blake observed "immense, imperfect crystals of tourmaline" at San Felipe in 1853.[11]

Alluvial fans of decomposed granite line the valley, sloping gradually to steep fault scarps; the name of Volcan Mountain likely derives not from a mistaken impression that it is volcanic in origin, but from an American-Spanish meaning of *volcán* – a precipice.[12] The alluvial fan at the outlet of Arkansas Canyon offers clues to the climatic and geological development of the entire valley. The oak grove on this fan comprises numerous old trees with several large milling sites located nearby.[13] Carl Sauer noted the curious coincidence of a desert landform and an oak woodland here, suggesting that Arkansas Canyon's alluvial fan indicates that arid conditions prevailed during previous eras, while the presence of the ancient oaks demonstrates that the rising mountain block has led to more mesic conditions.[14]

Alluvial deposits in the valley are older along the perimeters of the mountains and younger in the central valley floor. The older fan deposits include sand, gravel, and boulders, while the younger deposits – where deposition continues today – are composed of sand, gravel, silt and clay. The central portion of the valley contains deep fill, "at least scores of feet thick," according to Sauer.[15] The valley's ground water is contained mainly in the older alluvium; the younger deposits transmit runoff to the older.[16] Ravine

cutting in the lower part of the valley may have lowered the level of ground water within the last century.

Sentenac Cienega, a wetland formed atop exceedingly deep fill, is the result of a granite dam that extends underground from the Cigarette Hills at the lower end of the valley,[17] combined perhaps with the blockage of drainage by a fan.[18] In the southern half of valley, arid conditions still prevail. The valley floors are pediment fans, formed by desert weathering of the valley flanks.[19] This part of the valley includes several dry lakes, formed by drainage blockage by fan fronts.[20]

The creek bed beyond the cienega proper in Sentenac Canyon is lined with calcareous tufa or travertine, formed through depositions by algae.[21] W. P. Blake noted these deposits in 1853, writing, "...the rocks in the bed of the stream are partly covered by a remarkable encrustation...."[22] The occurrence of a calcareous crust, usually deposited slowly under swamp-like conditions, proved remarkable to later observers as well, since Sentenac is a steep desert canyon. Deep pools formed by tufa accretion may help to reinforce swampy conditions – essentially an extension of the cienega – down the streambed, providing footholds for reeds and other plants typical of marshes. Sauer described Sentenac Cienega as "a tule-choked marsh of deep, black, organic soil resting on a cemented floor of cobbles," and noted that algae-produced tufa and its associated wetlands are found only on desert, not the coastal, side of the mountains.[23]

Climate

The desert of San Diego County receives little annual precipitation, yet unlike cismontane areas the desert has two rainy seasons. Paul Long and Ronald May state that

perhaps 50% of San Felipe Valley's precipitation comes from summer thunderstorms, but this high a percentage may be more characteristic of the Arizona monsoon country to the east. State Park biologist Paul Jorgensen states that the eastern slope of the Peninsular Range receives about 1/3 of its precipitation from summer storms.[24] In the winter snow is possible throughout the valley; depending on the exact location, one can expect between 177 and 270 frost-free days.[25] The amount of precipitation varies greatly with elevation, from less than ten inches in the southern part of the valley to as much as fifty inches in the uplands in a very wet year.[26] Sauer remarked on the abruptness of climatic change in the valley: "The change from mesothermal to arid conditions takes place in a zone perhaps not more than two miles wide…"[27] This abrupt change and the associated change from one to two rainy seasons are two principal reasons for the astonishing variety of life found in San Felipe.

Plants

From the summit of Volcan Mountain at more than 5000 feet elevation to the valley floor and canyon, San Felipe encompasses nearly all the life zones known for the eastern slope of the Peninsular Ranges. Plant communities present include coniferous forest, grassland, southern oak woodland, desert transition chaparral, rocky slope (desert succulent scrub), desert wash woodland, riparian woodland, and freshwater marsh.[28] Above 3000 feet, plant species include bigcone Douglas fir, ponderosa pine, Coulter pine, Jeffrey pine, California juniper, coast live oak, California black oak, and Great Basin sagebrush. Upper Sonoran life zone plants, occurring between 1500 and 3000 feet, include sage, juniper, barrel and prickly pear cactus, and scrub oaks. At around 2000 feet

and below, creosote bush, mesquite, ocotillo, palo verde, brittlebush, cholla cactus, willow, and cottonwood are present. The diversity of San Felipe's plant life was noted by E. Yale Dawson, who wrote in the field guide *Cacti of California* that a student of California's desert plant life can do no better than to visit San Felipe: "Most of the interior species of the southernmost desert parts of California may be seen along Highway 78 from Banner down Sentenac Canyon."[29]

Two rare and threatened plant communities appear at the creek and cienega, mesquite bosque – Thomas Coulter collected the type specimen for screwbean mesquite here in 1832 – and Sonoran cottonwood willow forest. The thick riparian gallery that runs from the cienega upstream more than two more miles is one of the most extensive sets of big (higher than 35 feet) cottonwoods in San Diego County.[30] Parish lip fern is one of the rare or endangered species in these areas.[31] Farther up the valley, the fan at the outlet of Arkansas Canyon may qualify as alluvial fan sage scrub.[32] Range limits reached in San Felipe Valley or nearby on Volcan Mountain include those for the recently discovered Nevada small sunflower, the bigcone Douglas fir, western redbud, San Felipe coyote-mint, and California black oak.[33]

Mesquite beans are highly prized as forage by both livestock and native animals. Ranchers in the area actively clear mesquite, and the plant can in fact be a sign of overgrazing. The hard shell covering mesquite beans is an adaptation to life in an area prone to intense flooding- the casings won't be broken open until sufficient water is coursing through the area, smashing the pods against rocks. But the intestinal tracts of cattle are also efficient mechanisms for opening the pods. As Peggy Larson writes, "Mesquites have thus been ready-planted in often overgrazed rangeland, further

deteriorating it and arousing ranchers' ire."[34] The next chapter of this thesis presents historical evidence implicating overgrazing as a factor in the spread of mesquite in desert-edge grasslands near San Felipe.

Grasses tolerate high fire frequencies, so the presence of significant grassland in the valley suggests recurrent fires in the past. The hillsides expect and encourage fire, for fire-adapted chaparral plants dominate the transition between grassland and higher elevation forest. Many of these plants sprout from roots or buds after a fire, or depend on heat to break the dormancy of their seeds; some also contain volatile oils or bear highly flammable fibrous or ribbonlike shreds of bark.[35] Pure stands of Chamise (*Adenostoma fasiculatum*), a plant high in volatile oils, occupy many of San Felipe Valley's slopes, awaiting only a spark on the right day to ignite a firestorm.

One climatic characteristic of the valley that has a profound effect on its plant life is its winds. Long and May state, "Surface winds contribute significantly to the high rate of evaporation in the valley."[36] Away from available ground water, succulence is an adaptation to quick soil drying; succulents have extensive shallow root systems.[37] Non-succulents tolerate drought through dormancy, leaf changes (creosote leaves become more resinous during extended drought, for instance), and perennial growth.[38] Wildflowers and other annuals avoid drought by producing seeds that may wait years for a drenching rainfall to leach out their chemical germination inhibitors. Creosote bush is perhaps North America's most drought-tolerant perennial. The creosote bush scrub community is the driest desert community, and due to the amount of space available to annuals between the creosotes this community tends to have the densest wildflower display in wet years.[39]

Insects

The dense blooms of the desert floor and other areas of San Felipe attract a host of pollinators. According to biologist Jack N. Levy, "the Scissors Crossing and Sentenac Canyon areas were favorite collecting grounds for Lepidopterists earlier in the [twentieth] century."[40] In all, fifty-two butterfly species have been recorded for the area.[41] A one-day spring count in 1996 recorded thirteen species, and a spring count in 1998 noted fifteen species.[42] This last count found most of the butterflies necturing on alkali goldenbush, the prevalent blooming plant at the time. Butterflies are important prey for insectivorous birds and other predators, and have shown other interactions in ecosystems as well. Larvae of various gossamer winged-butterflies, for instance, produce a type of honeydew that is attractive to ants. Included in this family (Lycaenidae) are the hairstreaks, coppers and blues. A total of fourteen species of Lycaenidae have been recorded for Sentenac Canyon and Cienega, including three that show strong associations with honey mesquite.[43]

Birds

In an area rich with insects, one would expect to find a corresponding wealth of insectivores, and San Felipe Valley abounds with insectivorous birds. It may also be the most important inland flyway for migratory birds in San Diego County. In a single weekend in April 1999, William E. Haas witnessed a prairie falcon, cliff swallows and Vaux's swifts, plus migratory birds including Wilson's, yellow and Nashville warblers,

warbling vireos, and a "remarkable" eight gray flycatchers. He also noted more than 320 western bluebirds and at least 620 black-headed grosbeaks in a single day. "Surely San Felipe Valley," wrote Haas, "leading northwest to a low pass to the coastal slope, is a key route for spring migrants, used more heavily perhaps than any other in San Diego County."[44]

At least eight nesting pairs of the endangered least Bell's vireo have been found in San Felipe's riparian area, and sightings of other sensitive species have recently taken place. "Amid desert dryness and heat," writes Paul Jorgensen, "San Felipe Creek has produced magical surprises. Most of these surprises have come in the form of riparian birds; that is, birds that can't survive without streamside woodland habitat."[45] The thin tendril of riparian habitat stretching through Sentenac Cienega and Canyon extends the reach of a mesic environment into the desert. Anza-Borrego Desert State Park Superintendent Mark Jorgensen recently located a Cooper's hawk nest with nestlings, rare for the desert, in a large cottonwood tree in the Scissors Crossing area.[46]

In just the last few years, biologists have discovered a panoply of riparian birds in San Felipe, including the first breeding pairs of summer tanagers to be found in San Diego County, as well as rare southwestern willow flycatchers and the extremely elusive and endangered yellow-billed cuckoo. Other species recently observed – many of which exhibited breeding or nesting behavior – include western screech owls, indigo and lazuli buntings, Pacific-slope and brown-crested flycatchers, blue-gray gnatcatchers, northern harriers, oak titmice, western wood-pewees, yellow warblers, blue grosbeaks, and yellow-breasted chats. As Paul Jorgensen notes, "Now, virtually every riparian-loving bird species known to inland southern California has been found at San Felipe."[47] In

May 2002 the rare long-eared owl was added to the list of San Felipe Valley breeders, found at Scissors Crossing in a stick nest in a cottonwood.[48]

Away from the riparian area, birds adapt variously to the warmer, drier conditions. Some species, such as California quails and house finches, feed on succulent plant parts such as flowers, seed heads, and berries or other fruits. Black-throated sparrows can survive exclusively on dry seeds. The lesser nighthawk's survival strategy consists of sleeping through the heat of the day and feeding on flying insects during the crepuscular hours of dusk and dawn. The nighthawk's relative, the poor-will, may actually hibernate in order to avoid an insect-poor winter. Loggerhead shrikes use the thorns of cacti and other desert plants to skewer their prey. Costa's hummingbirds thrive on red-flowered ocotillo and chuparosa. Mistletoe has a symbiotic relationship with phainopeplas and northern mockingbirds. Subsisting on mistletoe berries, the birds spread the seeds of the parasitic plant through their droppings to mesquites, catclaws and other plants.[49]

Some species, such as bushtits and Bewick's wrens, are near the eastern limit of their range in San Felipe. In the case of the woodpecker genus, *Dendrocropus,* the valley provides an example of the phenomenon known as parapatric distribution: the ranges of Nuttall's woodpeckers and ladderbacked woodpeckers fit together precisely, like the pieces of a jigsaw puzzle. According to Philip Unitt,

> Nuttall's Woodpeckers occur from the coast east over the summit of Volcan Mountain, down the west slope of San Felipe Valley in the live oak trees, and into the cottonwoods and willows growing in the bed of San Felipe Creek above Scissors Crossing. Ladderbacked Woodpeckers range west through the mesquite thickets along Vallecito Creek, high up into the piñons on the north slope of Whale Peak, to the desert-edge scrub of the San Felipe Valley. The two species occur within a mile of each other in this valley, yet their ranges do not overlap. Within its range, each species occurs in a variety of habitats, yet at their contact point they are precisely segregated.[50]

Reptiles and Amphibians

Herpetologists have also encountered a mosaic in San Felipe – another echo of the general pattern of confused relief – composed of the home ranges of reptiles and amphibians. As Mark Dodero has written (in what he terms "an oversimplified explanation"), the herpetofauna of the eastern slope of the Peninsular Range converge from three main source regions: the cool, mesic mountainous areas, the rocky desert slopes, and the vast Sonoran Desert region of which the mountains form the western border.[51]

In San Felipe Valley the riparian areas and cienega complicate this basic picture of reptile and amphibian distribution. The Sentenac Cienega – Scissors Crossing area seems to mark a major range boundary for several species of herpetofauna. For instance, Joe Copp has identified this area as the only place where the San Diego gopher snake (*Pituophis melanoleucus annectens*) and the Sonoran gopher snake (*P. m. affinis*) engage in gene exchange. The resulting hybrids are markedly less fecund than either parent, resulting in a suppressed population. Thus we have another possible example of parapatry – the two taxa "occupy extensive geographic distributions on either side of the narrow contact zone," but "[g]opher snakes are much less common around Scissors Crossing" than elsewhere in the valley.[52]

That this area is a meeting ground for animals from various source regions is evidenced by intergradation of subspecies here of western blind snake. In addition, some evidence exists for intergradation of western patch-nosed snake subspecies. Another indication of the special character of the area is its population of the Colorado Desert shovel-nosed snake. According to Copp, "There is a remarkable, unique, and, perhaps,

isolated population of this snake around Scissors Crossing that is characterized by exceptionally large wide black bands, most of which encircle the body, and bright reddish orange saddles occupying most or all of the interspaces."[53]

The cienega area defines a limit for several species, also. The western leaf-nosed snake, for example, reaches its western limit here. The San Diego horned lizard occurs near Sentenac Cienega, but is more common in the central portion of San Felipe Valley.[54] Scant records exist for a host of other species, awaiting confirmation by a careful field survey. Meantime, the California red-legged frog, once abundant throughout the canyon, cienega, and upper creek, has apparently been extirpated.[55]

Down and up the watershed from the cienega, herpetofauna with specialized habitat adaptations can be found. The rocky, dry microhabitats of the sides of Sentenac Canyon make it a perfect home for the Peninsular leaf-toed gecko, so named for the discs on the ends of its digits, which possess hair-like projections that allow the gecko to navigate smooth vertical rock surfaces at high speed and easily catch insects and spiders.[56] In the upper portions of San Felipe Valley the large-blotched salamander occurs, a beautifully patterned animal that requires moist areas underground or within a decaying log to lay its eggs.[57] The distribution of rattlesnake species, meanwhile, seems to be keyed to slope and shade. According to William Haas, speckled rattlesnakes (*Crotalus mitchellii*) are more common on west-facing slopes, while red diamond rattlesnakes (*C. exsul*) are found in cooler locations. Finally, the western rattlesnake (*C. viridis*), though distributed throughout the valley, is most concentrated in disturbed areas.

Mammals

San Felipe Valley's mammal population also shows a mixed set of distributions. Generalists such as bobcats, cougars and coyotes can be found throughout the valley. Other species use the area seasonally. California Department of Fish and Game biologists describe the valley as a critical seasonal site for southern mule deer: "…San Felipe Valley… is an extremely important fawning and summer area for southern mule deer occupying the east-central desert of San Diego County."[58] Sensitive mammal species observer or expected in the valley include the pallid bat, California leaf-nosed bat, San Diego pocket mouse, peninsular bighorn sheep, and American badger.[59]

Fish

The endangered unarmored threespine stickleback is present in San Felipe Creek. This particular population is descended from an introduction by state biologists,[60] and the fish does not appear to be native to the creek, though J.G. Cooper noted in 1874, "Trout and sticklebacks are found at Warner's Pass fifteen miles north of San Felipe at the head of the San Luis Rey river."[61] Small populations of the Mohave tui chub were introduced in the 1936 and again in 1940, but this species does not appear to be present today.[62]

Summary

Observations in San Felipe show it to be a physically and biologically diverse area, a place of innumerable competitions and collaborations in the natural community. Plant and animal species of the valley show elaborate adaptations to landforms, climate, fire, and each other. Salient features of the ecosystem, to be revisited in later chapters,

include a dense, extensive riparian area in the lower part of the valley, a lowered streambed in the same area, a heavily grazed grassland, and a landscape that is built to burn.

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[1] Lynne Foster provides an excellent, brief discussion of arid land processes in *Adventuring in the California Desert* (San Francisco: Sierra Club Books, 1987), 19-22.

[2] *Ibid.*, 10.

[3] Diane M. Burns, ed.; Harold J. Clifford, Frederick W. Bergen, Steven G. Spear, *Geology of San Diego County: Legacy of the Land* (San Diego, Calif.: Sunbelt Publications, 1997), 29.

[4] Sauer, "Land Forms," 237.

[5] *Ibid.*, 238.

[6] Frederick Jee, "Geology of Anza-Borrego: A Window to the Past," *Environment Southwest,* No. 511 (Autumn 1985), 15.

[7] Paul Remeika and Lowell Lindsay, *Geology of Anza-Borrego: Edge of Creation* (San Diego, Calif.: Sunbelt Publications, 1992), 55.

[8] *Ibid.*, 56.

[9] Foster, *Adventuring,* 18.

[10] Remeika and Lindsay, *Geology of Anza-Borrego,* 58.

[11] W.P. Blake, *Geological Reconnaissance in California: Made in Connection with the Expedition to Survey Routes in California, to Connect with the Survey of Routes for a Railroad from the Mississippi River to the Pacific Ocean, under the Command of Lieut. R.S. Williamson, Corps. Top. Eng'Rs, in 1853* (New York: H. Bailliere, 1858), 107.

[12] Universidad de Oviedo, "Dicconario de Español," http://tradu.scig.uniovi.es/busca.html; website visited April 8, 2002.

[13] Long May, "Archaeological Survey," 10.

[14] Sauer, "Land Forms," 246.

[15] Long and May, "Archaeological Survey," 15; Sauer, "Land Forms," 238.

[16] Long and May, "Archaeological Survey." 15.

[17] Long and May, "Archaeological Survey," 10.

[18] Sauer, "Land Forms," 239.

[19] *Ibid.*, 243.

[20] *Ibid.*, 244.

[21] *Ibid.*, 244.

[22] Blake, *Geological Reconnaissance in California*, 124.

[23]Sauer, "Land Forms," 245.

[24] Paul Jorgensen, personal communication.

[25] Long and May, "Archaeological Survey," 17.

[26] Sauer, "Land Forms,"

[27] *Ibid.*, 243.

[28] The life zone characterizations listed in this section are derived from the author's personal observations and are based on the descriptions of life zones and biotic communities given by Remeika and Lindsay, *Geology of Anza-Borrego*, 79, 81; and Foster, *Adventuring,* 31-32.

[29] E. Yale Dawson, *The Cacti of California* (Berkeley: University of California Press, 1966), 12.

[30] Paul Jorgensen, personal communication.

[31] Diana Lindsay, *Anza-Borrego A to Z: People, Places and Things* (San Diego, Calif.: Sunbelt Publications, 2000), 314.

[32] Robert Faught, personal communication.

[33] Fred Sproul, "Reflections on Volcan Mountain's Biological Survey," *The Julian News,* April 10, 2002.

[34] Peggy Larson, *The Sierra Club Naturalist's Guide to the Deserts of the Southwest* (San Francisco: Sierra Club Books, 1977), 131.

[35] Allan A. Schoenherr, *A Natural History of California* (Berkeley and Los Angeles, University of California Press, 1992), 341.

[36] Long and May, "Archaeological Survey," 17.

[37] Foster, *Adventuring,* 27-28.

[38] Foster, *Adventuring,* 29.

[39] Foster, *Adventuring,* 31.

[40] Jack N. Levy, letter to Paul Jorgensen, October 3, 1996. Copy in possession of author.

[41] John Brown, "Butterflies Recorded from the Sentenac Canyon Area, San Diego County, California," 1996, list in files of Paul Jorgensen. Copy in possession of author.

[42] Brown, "Butterflies Recorded;" "Butterfly Count – Oct. 11, 1998: Sentenac Canyon / Cienega, ABDSP," data sheet in files of Paul Jorgensen. Copy in possession of author.

[43] Schoenherr, "Natural History," 501; Brown, "Butterflies Recorded."

[44] William E. Haas, "Floodgates Open: Migrants Attack San Diego County," in "Wrenderings: Reports from the Field, Summer 1999," San Diego County Bird Atlas, San Diego Natural History Museum website, http://www.sdnhm.org/research/birdatlas/wrenderings/99summer-reports.html. Visited on April 15, 2002.

[45] Paul Jorgensen, "Treasures of San Felipe," in "Wrenderings: Reports from the Field, Winter 2001," San Diego County Bird Atlas, San Diego Natural History Museum website, http://www.sdnhm.org/research/birdatlas/wrenderings/01winter-reports.html. Site visited on April 15, 2002.

[46] *Ibid.*

[47] *Ibid.*

[48] Paul Jorgensen, personal communication.

[49] The information in this paragraph results from a cross-comparison of a list of species present in the central portion of San Felipe Valley, provided by William Haas to Paul Jorgensen (copy in possession of author), with Philip Unitt, "On Being a Bird in Borrego," *Environment Southwest,* No. 511 (Autumn 1985), 18-19.

[50] Unitt, "On Being a Bird," 19. Note that recent evidence has emerged for overlap of the two species' ranges (Paul Jorgensen, personal communication).

[51] Mark Dodero, "Lizards and the Like," *Environment Southwest,* No. 511 (Autumn 1985), 22.

[52] Joe Copp, Letter to Jim Dice, March 25, 1996. Copy in files of Paul Jorgensen.

[53] *Ibid.*

[54] Paul Jorgensen found two coast horned lizards near the cienega in 2000 (personal communication). In the fall of 2001, I had a brief glimpse of two skittering horned lizards at Scissors Crossing, but later could not describe the color in enough detail to park biologists for them to hazard a guess as to whether I had seen the coast or desert subspecies.

[55] Joe Copp to Jim Dice, March 25, 1996.

[56] *Ibid.;* Dodero, "Lizards," 23.

[57] *Ibid.,* 22-23; Haas, species list.

[58] "Wildlife Conservation Board Approves More Than $5 Million San Felipe Valley Wildlife Area Expansion in San Diego County," Wildlife Conservation Board News Release, November 30, 2001.

[59] "Sentenac Canyon and Cienaga: Scissors Crossing," handout prepared by the Anza –Borrego Foundation (March 1994), 8.

[60] U.S. Fish and Wildlife Service, "Biological and Conference Opinions," http://www.r5.fs.fed.us/sccs/download/programmatic-bo.pdf, visited June 5, 2002.

[61] J.G. Cooper, "Animal Life of the Cuyamaca Mountains," *American Naturalist,* Volume 8, Issue 1 (January, 1874), 15.

[62] Leo Nico and Pam Fuller, "Nonindigenous Aquatic Species: *Gila bicolor* (Girard 1856)," http://nas.er.usgs.gov/fishes/accounts/cyprinid/gi_bicol.html, visited June 5, 2002.

Chapter 3

Time out of Mind: Historical Interactions between Humans and the San Felipe Valley Environment

In 1846 Capt. A. R. Johnson of the American Kearny Expedition took the trail through San Felipe and commented, "the constant seeing of pieces of pottery shows that Indians have traversed it time out of mind."[1] Over that time, of course, Indians were doing more than traversing the trail and dropping pottery, and many changes in the land have occurred since 1846. The previous chapter of this thesis focused on the current state of the San Felipe Valley environment. This chapter will tell part of the long story of how things got to be that way.

A sophisticated indigenous land management regime was in place in San Felipe for perhaps thousands of years, but the agents of expansion for the Spanish Empire and American Manifest Destiny saw the valley's indigenous people as savages and its natural community as a collection of consumable resources. The native land-management techniques were embedded in a cultural complex that unraveled under the combined pressures of missionization, heavy migration and settlement by Euroamericans, and the associated assimilation into new cultures. Thus the travelers and settlers who documented the progress of empire simultaneously described the decline of local culture and land. San Felipe chroniclers noted signs of acculturation and assimilation such as the use of alcohol, money, European-style clothing and other products by the mid-nineteenth century, and these cultural changes occurred hand in hand with extreme new pressures – in the form of intense livestock grazing – on local natural resources. Some historians also count climate change as a major factor in land transformation in San Felipe.[2] The

changes in San Felipe resulting from all these factors have included a reduction in grass, a lowered water table and modifications in streamside vegetation, mesquite distribution, and animal populations. But let's begin at the beginning, or at least at as early a point as the data will allow.

Prehistory

Archaeologists have delineated three main cultural periods in the Colorado Desert region's prehistory: Paleoindian, Archaic, and Late Prehistoric or Patayan.[3] The Paleoindian Period, lasting from approximately twelve to seven thousand years ago, was characterized by small, mobile bands of hunter-gatherers. Some of these bands, collectively referred to as the San Dieguito Complex, probably occupied the San Felipe Valley area from time to time, but the evidence is elusive. Archaeologists found a few rock circles dating from early in the Paleoindian Period and three San Dieguito projectile points from later in the period on the San Felipe Ranch property in 1969,[4] but a recent survey of the Scissors Crossing area uncovered no Paleoindian artifacts.[5]

Researchers have found some evidence for occupation during the Archaic Period, from about 7,000 to about 1,200 years ago. This period is distinguished from the Paleoindian by a greater diversity of hunting and gathering activities. Large dart points appeared in the Archaic Period and milling equipment became common, indicating increased use of plant resources. An Archaic Period point was recently found in Arkansas Canyon.[6]

The Late Prehistoric or Patayan Period, marked by the introduction of ceramic pottery around 1,200 years ago and continuing until Spanish contact, saw increased use