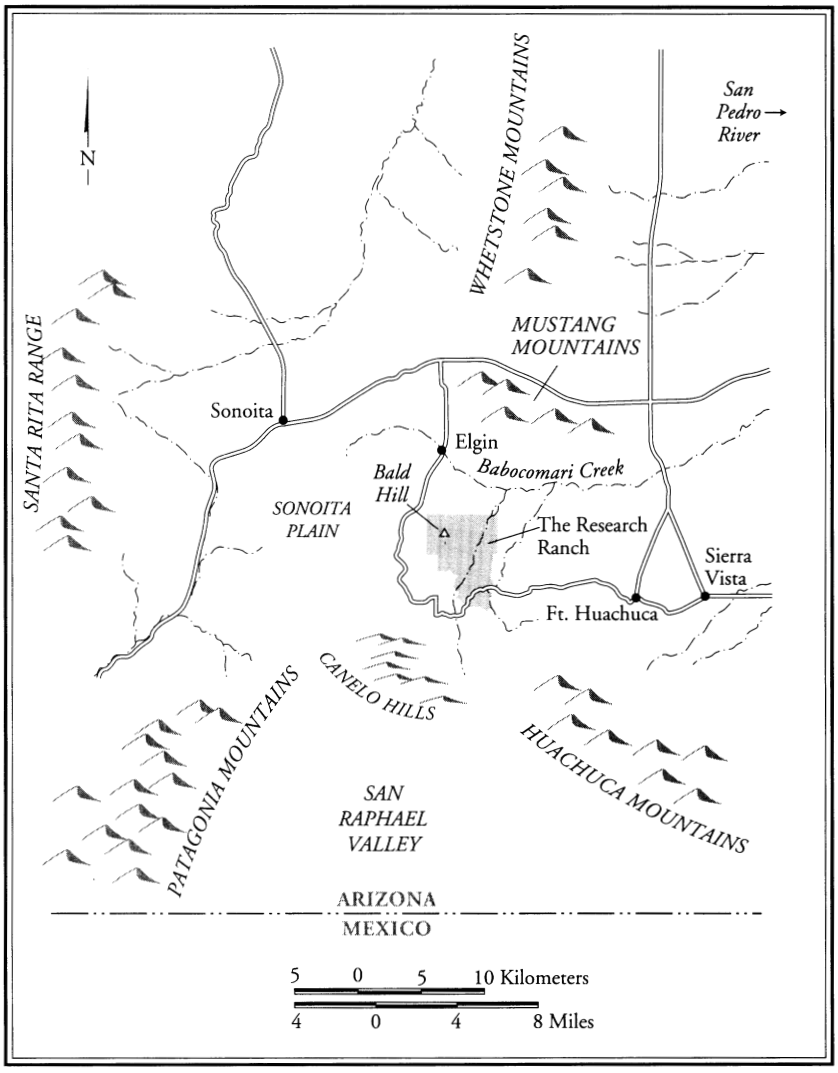
One

THE GRASSLANDS OF CORONADO

On the Sonoita Plain, beyond the far northern edge of the Sierra Madre Occidental, lies the small town of Elgin, Arizona. For many years there was a gas, grocery, and post office place in Elgin with a sign over the door that said simply, "Where the sun shines and the wind blows." The sign and the store are long gone, but it still is sunny and windy out there, especially in the dry months of May and June.

Elgin was scarcely alive in the summer of 1991, after they closed up the post office and moved the school. But its few remaining residents could see the increasing lights of Tucson and Sierra Vista against the night sky, and they probably knew that things were due for change. We moved away from the Sonoita Valley that year, and we thought it was for good.

About seven miles south of Elgin there is a rounded prominence called Bald Hill. Like most of the Sonoita Plain, Bald Hill is a high desert grassland, treeless except for an occasional mesquite and some live oak growing in washes around its base. Bald Hill is part of a rolling open valley that stretches out and then up into distant slopes of surrounding mountains (Map 1). It also is part of a unique property, managed not for cattle or grapes or housing like most of the region is today, but as a relatively undisturbed place where ecological patterns and



MAP 1. The Sonoita Valley and vicinity. (Redrawn from a map prepared at the Research Ranch by Erika Geiger)

FIGURE 1. The Research Ranch in 1998, looking west. Bald Hill is the low knoll to the right of the Santa Rita Range on the far horizon. (Photo by Erika Geiger)

processes in the grasslands and savannas can reveal themselves as nearly as possible without human interference. We began to study this Arizona high plain in 1974, and the present book is about some of the things we and others have learned there.

The view from Bald Hill is a classic landscape of the American West, an arid place usually more brown than green, with clear skies and far horizons (Fig. 1). It is basin and range country, like most of southeastern Arizona, except that the Sonoita Basin is higher and cooler and wetter than most, and so it is a grassland and neither Chihuahuan nor Sonoran desert.

A few miles to the north of Bald Hill are the cave-pocked limestone cliffs of the Mustang Mountains (Fig. 2). Behind the Mustangs are the Whetstone Mountains, and thirty miles east the otherworldly rocks of Texas Canyon and the Dragoons. The dark forested slopes of the Huachuca Mountains rise out of the plains to the southeast. The Santa Rita Range frames the western horizon. Even in the hottest days of

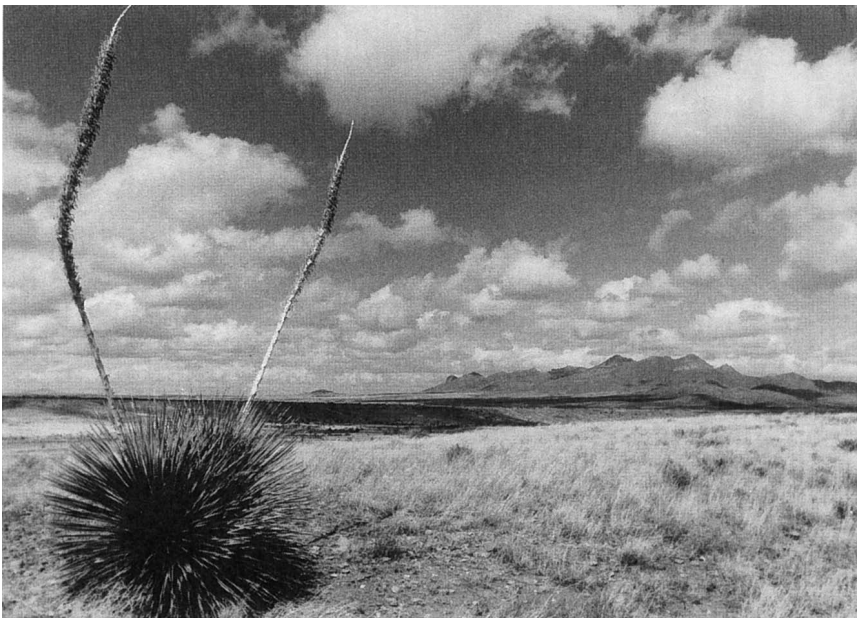


FIGURE 2. The Research Ranch in 1998, looking north to the Mustang Mountains. (Photo by Erika Geiger)

June, a patch of snow may persist atop the Santa Ritas, if it has been a wet spring. Due south, the country grades steadily and gently up into oak savannas of the Canelo Hills. Beyond these lie grasslands in the San Rafael Valley, and then Mexico—only twenty miles away as the Chihuahuan raven flies.

When the summer rains come in July or August, water runs north off the slopes of Bald Hill into Vaughn Canyon, and then east down Babocomari Creek to the San Pedro River. The San Pedro itself flows north to the Gila, which in turn feeds the Colorado. In the very old days it is possible that a drop of rain falling on Bald Hill might eventually have reached the Gulf of California by this route.

HISTORY

Prior to 1968 the history of Bald Hill was essentially the same as that of the Sonoita Plain as a whole. Humans had occupied the region for

at least the preceding ten thousand years, hunting game and collecting wild plant foods and perhaps exterminating some of both. Local peoples added agriculture to their repertoire over a thousand years ago, growing crops such as maize, beans, and squash. These earliest agricultural efforts were confined largely to floodplains and low benches along watercourses. The semiarid grasslands of Bald Hill probably were not much affected.

In 1540, Francisco Vásquez de Coronado traveled north out of old Mexico, probably down the San Pedro River east of Bald Hill. His expeditionary party brought horses and cattle. Because very few if any bison had occupied southern Arizona since at least the close of the last ice age, Coronado's livestock comprised an ecological force new to the region. For the first time in thousands of years, large herds of hooved mammals grazed the grasses of the Southwest. Although other hooved mammals were common in the valley of the San Pedro and on the Sonoita Plain, including peccary, mule deer, white-tailed deer, and pronghorn, these species forage relatively infrequently on grasses. They would never have controlled the structure and function of local grasslands in the manner of bison in the Great Plains, or wildebeest in the Serengeti.

Some few livestock doubtless grazed on the Sonoita Plain and perhaps even on Bald Hill between 1540 and 1800, during which time the region was variously influenced and occupied by Spaniards, Mexicans, and Native Americans. Cattle arrived to stay in 1832, when most of the area became part of the San Ignacio del Babocomari land grant. Livestock became the dominant regional ecological force they remain to this day with the arrival of Anglo-American ranchers and the establishment of nearby Fort Huachuca, in 1877.

By the 1880s, tens of thousands of cattle were grazing the Sonoita Valley. At first the land must have seemed fertile and the range inexhaustible. Summer rains were heavy. The preceding millennia of photosynthesis without grazing had provided the perennial grass plants with vast stores of ecological capital. It proved to be a short-lived bounty, however. Cattle soon beat down the native grasses, and shrubs and mesquite trees quickly spread into formerly pure grasslands. Black-tailed prairie dogs and frequent lightning-caused wildfires had played

key historic roles in keeping woody plants out of the grasslands. But the prairie dogs were extirpated, and now fires could no longer sweep across the Sonoita Valley because cattle had eaten away all the fuel.

A severe and prolonged drought finished off what little of the desert grass the cattle had spared. Most of the nineteenth century had been unusually wet in the American Southwest, and this had led to unrealistic expectations and a regional ranching mythology that nearly destroyed its grasslands. It all unraveled during the droughts of 1891 and 1892. Summer rains never came in those years, and by 1893 as many as three-quarters of the cattle had starved. Before they died, they pounded the range virtually into oblivion. This one event marked the time when the prehistoric high plains of southern Arizona were lost forever from our view.

With time the grasslands of the Sonoita Valley recovered to some degree from the drought of the 1890s, and ranching continued. While grazing intensity never again equaled that of the 1880s, it was sufficient to hold the land in a new ecological equilibrium, dominated now by certain grasses and other plant species that were more resilient to the effects of livestock grazing.

In September 1919, Juan Telles established a homestead claim around a small spring on the north slope of Bald Hill. Some time between then and now the spring pretty much stopped flowing, and Juan Telles' adobe house eroded away. Eventually, the Telles homestead became part of a much larger property, the Clark Ranch. In 1959 the Clark Ranch was purchased by Ariel and Frank Appleton (Fig. 3), who subsequently expanded the property to include the adjacent Swinging H Ranch. Together these properties made up the Elgin Hereford Ranch, which operated as such through 1967.

In 1968, a transformation occurred on the Elgin Hereford Ranch that changed the fate of Bald Hill as dramatically as had the journey of Coronado four centuries earlier. The Appletons removed all livestock and rededicated their land, now called the Research Ranch, as an environmental preserve and natural ecological laboratory. The National Audubon Society assumed management responsibilities for the property in 1980, using income from an endowment provided by the Whittell Foundation for that purpose, and the Appleton-Whittell Research Ranch Sanctuary came into being.

FIGURE 3. Ariel Appleton, with the endangered Bolson tortoise, a species she has worked to save. (Photo by the authors)

To those of us who have worked and lived there, the place has always been the Research Ranch, or TRR, or simply "the Ranch." Of course it is no longer a ranch at all, and this has been a source of understandable confusion for neighbors and colleagues. Some longtime ranching neighbors continue to use the old way of identifying a spread in the valley, by first name only. For example, the Diamond C Ranch is called simply "the Diamond C." By the same tradition they refer to the sanctuary as "the Research," and that is fine with us.

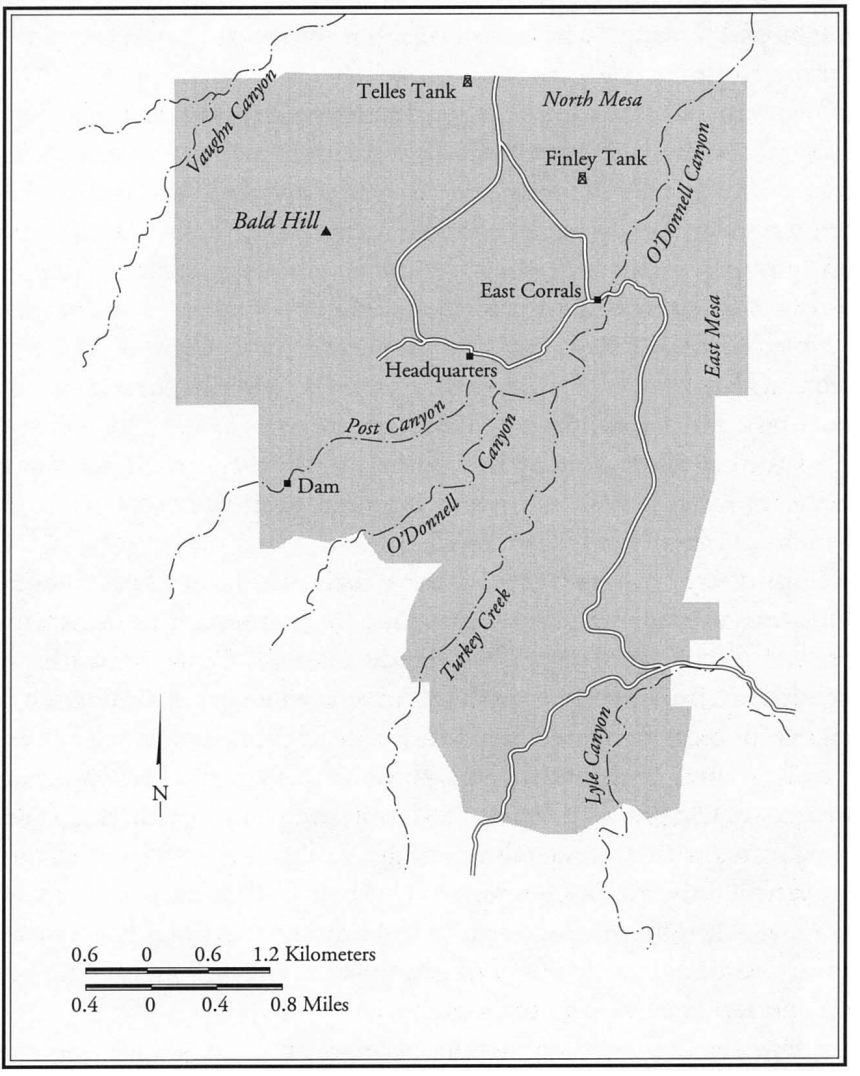
A research ranch might well be expected to be a place where ranching activities are implemented and studied. Perhaps the sanctuary, given its purposes, should be called the Not Ranch. But old and first names tend to stick, and so the Ranch probably will stay the Ranch indefinitely.

The sanctuary includes just over 7,800 acres (3,160 ha), about 40 percent of which is private land. The remaining 60 percent belongs to the people of the United States, with management responsibility being about equally divided between Coronado National Forest and the Bureau of Land Management. Through cooperative agreements between the National Audubon Society and these agencies, the former federal grazing leases that are part of the Appleton-Whittell Research Ranch have been dedicated to the overall research and conservation goals of the sanctuary.

THE LAY OF THE LAND

For more than twenty-five years we have been involved in conducting and coordinating field studies at the Research Ranch, with the goal of understanding the dynamics of its ecosystems, the natural history of its flora and fauna, and impacts of human land use in the Sonoita Plain as a whole. After all that time, the landscape of the Ranch and vicinity has become as familiar as the lines on an old friend's face. We can talk and plan our work using a kind of shorthand geography that is as useful to us as it would be meaningless to strangers. Because the stories we want to tell in this book happened in real places—and the nature of those places influenced the outcome of the stories—it is necessary at the outset for the reader to gain some appreciation for the geography of our study area.

Elevations of the sanctuary range from 4,600 to 5,100 feet (1400 to 1560 m), the high points being Bald Hill in the northwest and ridges above Lyle Canyon in the southeast (Map 2). Three major drainages transect the property, each flowing from south to north as tributaries of Babocomari Creek (see Map 1). Vaughn and Lyle Canyons cut through the northwestern and southeastern corners of the sanctuary, respectively. The major drainage is O'Donnell Canyon, which receives



MAP 2. The Research Ranch, showing major drainages, roads, and other features. (Redrawn from a map prepared by Erika Geiger)

two tributaries centrally on the sanctuary, Turkey Creek from the south and Post Creek from the southwest, and then flows northeast off the Ranch into Babocomari Creek. All of these drainages may have had year-round flowing water historically, but for the most part today the streams run only seasonally.

Two very different sorts of vegetation follow the drainages. The first is riparian woodland, consisting of varying mixtures of sycamore, walnut, ash, cottonwood, willow, live oak, and assorted shrubs. The second is a broad floodplain grassland dominated by sacaton, a tall grass that grows in nearly monocultural stands wherever stream drainages are broad and gentle enough for accumulation of deep soil sediments.

Uplands include Bald Hill and the North Mesa, between O'Donnell and Vaughn Canyons in the northern and western portions of the sanctuary. The broad and level East Mesa lies between O'Donnell and Lyle Canyons along the eastern boundary of the property. To the south are more heavily dissected ridges between Post, upper O'Donnell, Turkey Creek, and Lyle Canyons.

Upland vegetation on the Research Ranch consists of relatively open grasslands with scattered small mesquite trees, especially in the northern half of the sanctuary. These grade southward into increasingly wooded savannas of Emory oak and Arizona white oak. Dominant upland ground cover includes short and mid-height perennial grasses, especially grama grasses of the genus *Bouteloua,* threeawns (*Aristida*), and lovegrasses (*Eragrostis*). On localized limestone outcrops there also are some plants with a strong affinity to the Chihuahuan Desert: ocotillo (a relative of the famous boojum tree of Baja California, so named after Lewis Carroll's fanciful poem "The Hunting of the Snark"), a white zinnea, some acacia shrubs, and grasses such as black grama that are uncommon elsewhere on the sanctuary.

There are two very important permanent water sources on the Ranch. One is Finley Tank, an impounded perennial spring in a ravine off the North Mesa. The second is a dam on Post Canyon that holds enough water even in the driest years and months to support a small cattail wetland.

Two facilities provide living and work space for researchers and the resident manager of the Ranch. These are Headquarters (the original

Clark Ranch buildings) and East Corrals (the original Swinging H Ranch). We lived most summers, and a large part of many winters, in a house at East Corrals with a fine view looking north down O'Donnell Canyon and on toward the Mustang Mountains. To us, there was something mysterious and alluring about those dry hills, and if the Mustangs appear too many times in the photographs we have included in this book, that is why.