

Appendix I

CULTURE HISTORY OF THE PROPOSED WITHDRAWAL AREA

I.1 PREHISTORIC AND HISTORIC CULTURAL CHRONOLOGY

Following Willey and Phillips (1958), archaeologists generally divide the cultural history of the American Southwest (including the proposed withdrawal area) into five major periods: Paleoindian (9500–6500 B.C.), Archaic (6500 B.C.–A.D. 500 in the Grand Canyon region), Formative (A.D. 500–1300 at the Grand Canyon), Protohistoric (A.D. 1300–1540 at the Grand Canyon), and Historic (A.D. 1540–present at the Grand Canyon). The region from the Grand Canyon (or Canyon) south to the Mogollon Rim and Bill Williams River and from the San Francisco Peaks west to the Colorado River was occupied during all these periods, as discussed in numerous archaeological overviews, most importantly those of Stone (1987), Altschul and Fairley (1989), Ahlstrom et al. (1993), Burchett et al. (1994), Bair and Stoker (1994), Fairley et al. (1994), and Fairley (2004). Figure I-1 illustrates the general chronological sequence and cultural-historical units in the region.

The above-cited overviews also discuss the important research themes and questions pertaining to the Grand Canyon and surrounding region. The following overview of the culture history of this region summarizes and updates the historic contexts of the region and current research questions.

Although early occupants of the proposed withdrawal area were hunter gatherers, many groups, such as Ancestral Puebloan groups, Paiute, Cohonina, and others, practiced various types of farming and inhabited settlements on a seasonal or longer-term basis. Many factors may have affected changes in the occupation and use of this area over thousands of years, including environmental changes, population growth, migrations, conflicts, shifts in trade networks, and the adoption of farming. The following overview of the culture history of the proposed withdrawal area demonstrates its long and varied use by many different peoples.

I.1 PALEOINDIAN

The Paleoindian period was a time when peoples of the Southwest subsisted by hunting now-extinct large mammals using distinctive lanceolate projectile points (Fairley 1989a:86). During the Clovis period (9500–8800 B.C.), they hunted primarily mammoths, using fluted Clovis points. During the Folsom period (ca. 8800 B.C.), long-horned bison were hunted using fluted Folsom projectile points. During the Late Paleoindian period (ca. 7500–6500 B.C.), they hunted primarily modern bison using a number of unfluted, lanceolate projectile points.

Simonis (2001) indicates that “several mammoth sites have been found along the Colorado River,” which suggests that the principal game animal for the Clovis people was present in the region. Two Clovis point bases, two “Clovis-Folsom” point bases, and one Folsom projectile point found in the portion of northwestern Arizona from the Grand Canyon to the Mogollon Rim and from the San Francisco Peaks to the Grand Wash Cliffs provides evidence that Paleoindians used the region. Moreover, Paleoindian projectile points made from Mount Floyd and Government Mountain obsidians and rhyolites found elsewhere in the northern Southwest demonstrate that Paleoindians procured volcanic stone resources in the region and carried or traded these materials throughout the region.

	GENERAL GRAND CANYON REGION	PRESCOTT	CERBAT	COHONINA	PUEBLOAN	VIRGIN BRANCH	KAYENTA
A.D. 2000							
A.D. 1900	HISTORIC	PAI			PUEBLO V		
A.D.1800		STABILITY					
A.D.1700							
A.D.1600							
A.D.1500							
A.D.1400	PROTO - HISTORIC				PUEBLO IV		
A.D.1300	FORMATIVE	CHINO PHASE	EXPANSION		PUEBLO III	MESA HOUSE	TSEGI PHASE
A.D.1200				HULL PHASE			TRANSITIONAL PHASE
A.D.1100			DESERT	COCONINO PHASE	PUEBLO II	LOST CITY PHASE	BLACK MESA PHASE
A.D.1000		PRESCOTT PHASE					
A.D. 900					MEDICINE VALLEY PHASE		PUEBLO I
A.D. 800							
A.D. 700							
A.D. 600					BASKETMAKER III	MOAPA PHASE	LINO PHASE
A.D. 500							
A.D. 250	ARCHAIC	LATE ARCHAIC			BASKETMAKER II		
A.D. 1							
1000 B.C.					EARLY MAZE		
2000 B.C.							
3000 B.C.							
4000 B.C.	MIDDLE ARCHAIC						
5000 B.C.	EARLY ARCHAIC						
6000 B.C.							
7000 B.C.	PAI FOINDIAN	PAI FOINDIAN					

Figure I-1. Chronological sequence of cultural-historic units.

Two fluted projectile points (a base and a reworked point) classified as “Clovis-Folsom” and made of Presley Wash obsidian were found on a Formative site south of Ash Fork (Huckell 1982). Two Clovis projectile point bases from the Coconino Plateau are in Kaibab National Forest collections (Lyndon 2005). One of these was made of Government Mountain obsidian, the other, Black Tank obsidian. Pilles and Geib (2000) note that a Clovis point base found in the Village of Oak Creek, a Clovis point base from Cabin Draw (near Winona, Arizona), and the extensively reworked base of a Clovis point from

Kinnikinick Ruin (a Formative pueblo site south of Winona) were made of Government Mountain obsidian.

To date, the best evidence of Paleoindian presence in the Grand Canyon is a Folsom point from above the Redwall near Nankoweap and a Clovis point made from “paleo-pink chert” found near Desert View. A Lake Mohave point (9000–6000 B.C., which some archaeologists classify as Paleoindian and others as Archaic [Fairley 1989a:88; Lyndon 2005:56–57]), was found at AZ H:4:79(ASM) in the Watson III Prescribed Fire Unit on the South Rim of the Grand Canyon. Lyndon (2005:56–57) identified one Lake Mohave point from the Coconino Plateau in the Kaibab National Forest collections that was made of Government Mountain obsidian.

Paleoindian artifacts made from obsidians and rhyolites of the Mount Floyd volcanic field indicate that Paleoindians were using the region, acquiring stone for tools, and transporting the stone across the region. The “Clovis-Folsom” point bases of Presley Wash obsidian found near Ash Fork (Pilles and Geib 2000) have been mentioned above. According to Pilles and Geib (2000), a complete Clovis point found at Wupatki National Monument (Downum 1993) was made of Presley Wash rhyolite. A parallel-flaked Late Paleoindian projectile point of Presley Wash rhyolite was found at El Malpais National Monument near Grants, New Mexico, 490 km (307 miles) east of Mount Floyd (Powers and Orcutt 2005:46). On the other hand, Pitblado (2003:Table 7.1, Figure 5-7.1) found no Mount Floyd or Flagstaff obsidians or rhyolites in the western Colorado Paleoindian points that she sourced, which suggests that the Grand Canyon may have been a barrier between Paleoindian groups north and south of the Canyon.

Although Paleoindian projectile points from the region demonstrate that people used the area from the Grand Canyon to the Mogollon Rim and from the San Francisco Peaks to the Grand Wash Cliffs, evidence for Paleoindian use of the region is extremely rare, and none of the sites have been identified in this area, let alone excavated. Hence, almost nothing is known of the Paleoindian use of the area, other than that Paleoindians were present. Any evidence of Paleoindian use of the region is thus extremely important, even when it consists solely of isolated Paleoindian projectile points. Among the places where Paleoindian sites and artifacts might be expected are terraces around dry lakes (such as Red Lake in the Hualapai Valley) and springs (such as the springs in Grapevine Canyon near Grand Canyon West Ranch).

I.2 ARCHAIC

Following the Paleoindian period, the Archaic period began ca. 6500 B.C. and lasted until ca. A.D. 500 in the Southwest region of North America. It was marked by a subsistence strategy that was based on hunting modern species of animals and gathering wild plants (Ahlstrom et al. 1993:69). The Archaic period in the Grand Canyon was first recognized when split-twig figurines were found in caves that contained the bones of an extinct mountain goat (Emslie et al. 1995). Shaman’s Gallery (AZ B:9:201, Grand Canyon), a rock art site with painted images, dates to this period (Schaafsma 1990).

Archaeological surveys on both rims of the Grand Canyon continue to document an extensive Archaic presence. Sites and artifacts from the Early Archaic period are well represented. In the woodlands and forests of the Grand Canyon area, these sites have all been identified on the basis of projectile points, virtually all of which have been associated with the Archaic projectile point traditions of the Great Basin. A few Bajada points in the Pinto tradition, representing the Archaic tradition of the southeastern Colorado Plateau, have been found. The Oshara tradition includes Rio Puerco of the east, the San Juan Basin of the Four Corners area, and the Little Colorado River valley.

Most Archaic sites consist of artifact scatters ranging in number from 30 to more than 1,000 artifacts, with an average of 200 to 250 artifacts. These assemblages are dominated by flaked stone. Ground stone has been observed at only some of the sites, and, where present, it occurs in small numbers. Thermal features have been reported, but they are relatively rare at Archaic sites. Projectile point styles include

Gypsum, Elko, Elko Corner-notched, Elko Side-notched, Elko Eared, Sudden Side-notched, Northern Side-notched, Hawken Side-notched, Rocker Side-notched, Humboldt, Pinto, and Bajada. Other tools include bifaces, unifaces, knives, scrapers, a scraper plane, choppers, both retouched and utilized flakes, and utilized cores. Local Kaibab chert dominates the flaked stone assemblage, but obsidian (from Government Mountain, Presley Wash, and Partridge Creek, based on visual inspection) occurs at a minimum of 25% of Archaic sites on the South Rim of the Grand Canyon.

McNutt and Euler (1966) reported three lithic sites on Red Butte, just south of Grand Canyon Village. Tools from the sites included stemmed Pinto points, corner-notched Ventana-Amargosa points, knives, drills, punches, ovate knives, end scrapers, and other scrapers made from Kaibab chert and a range of volcanic material. See the Ethnographic section for more on this location.

Fifteen sites with evidence of Archaic use were investigated during the Transwestern Pipeline project (Burchett et al. 1994). One site contained two middens with charred *Portulaca* and *Chenopodium* seeds; bones of cottontail, dog or coyote, and small, medium-sized, and large mammals. Most of the rest of the sites were shallow artifact scatters with few if any subsurface deposits and artifact assemblages of mixed time periods. Flaked stone included cores, flakes, and tools (mostly projectile points but also bifaces, knives, scrapers, and drills). Projectile points were mostly of the Pinto style; a few side-notched points and Gypsum points were also identified. Flaked stone was mostly Kaibab chert, along with undifferentiated cherts, quartzite, rhyolites, and obsidians from Partridge Creek and Presley Wash (in the Mount Floyd volcanic field) and two pieces of obsidian from the Government Mountain source in the San Francisco Mountains volcanic field. At least three of the sites were interpreted as lithic raw material procurement sites at which Kaibab chert was collected and initial processing occurred. The lithic raw material procurement sites often contained a few tools, including obsidian tools, which suggested that lithic raw material procurement probably occurred in conjunction with other activities.

Excavations at Bighorn Cave in the Black Mountains west of Kingman (Geib and Keller 2002) provided extensive data on the Archaic subsistence practices and material culture in the region. Four periods of occupation were represented: 1) Late Archaic (1200–400 cal. B.C.); 2) terminal Archaic (200 cal. B.C.–cal. A.D. 100); 3) Formative (cal. A.D. 550–1200); and 4) Late Prehistoric–Protohistoric (cal. A.D. 1300–1700). The Late Archaic occupation of the cave was represented by one vegetation-lined pit (perhaps for curing screwbean mesquite pods), one roasting pit, and five hearths, as well as artifacts that included San Pedro points, Gypsum points, corner-notched dart points similar to Elko points, and two split-twig figurines (previously collected by looters). Oak leaves, hackberry leaves, and pinyon nuts indicated that the climate may have been somewhat cooler and wetter at this time. Flaked stone tools were indicative of a reliance on hunting.

Lyndon (2005) analyzed projectile points recovered from archaeological projects on the Coconino Plateau of the South Parcel. All periods from Paleoindian to Historic were represented. Archaic points could be classified as Great Basin types (Northern Side-notched, Sudden Side-notched, Gypsum Cave, Elko Eared [Jennings 1986]), and Oshara tradition types (Jay, Bajada, San Jose, Armijo [Irwin-Williams 1973]). Early Archaic (8000–6200 B.P.) projectile points were mostly Bajada points (n=15), although six Northern Side-notched points were present. Most of these points were made of obsidians and rhyolites from Mount Floyd and Government Mountain, but one Bajada point was made from Owl Rock chert from east of the San Francisco Peaks. Middle Archaic (6200–4600 B.P.) projectile points were mostly Pinto or San Jose points (n=33), although 10 Sudden Side-notched points were present. Most of the Middle Archaic points were made of obsidians and rhyolites from Mount Floyd and Government Mountain, but some were made of chert. Late Archaic projectile points included 34 Gypsum Cave Points, 23 Elko Eared points, nine “Chiricahua” projectile points, eight Armijo projectile points, seven San Rafael Side-notched points, and two Gatecliff Split-stemmed points. Most of the Late Archaic points were made of obsidians and rhyolites from Mount Floyd and Government Mountain, but some were made of Kaibab chert, other cherts, and chalcedony.

During Late Archaic times, maize was introduced to the Colorado Plateau. Maize has been found on Carrizo Wash in west-central New Mexico dating to as early as 2000 B.C. (Huber and Miljour 2004) and in the Chinle Valley and on Black Mesa dating to as early as 1000 B.C. (Gilpin 1994; Smiley 1994). In his analysis of projectile points from the Coconino Plateau in the collections of the Kaibab National Forest, Lyndon (2005) identified 17 side-notched points and 25 knives that he thought were characteristic of the Basketmaker II period (2400–1550 B.P.). At Bighorn Cave (Geib and Keller 2002), the terminal Archaic (200 cal. B.C.–cal. A.D. 100) was represented by one pit, one roasting pit, and one hearth, along with San Pedro points, Gypsum points, corner-notched dart points similar to Elko points, fringed split twigs, fabric made from S-twist cordage, and human coprolites (which contained agave, prickly pear fibers, screwbean mesquite pods, and goosefoot or pigweed greens); the only cultigen present was a squash seed. To date, few sites representing the transition to agriculture have been found at or near the Grand Canyon, although sites dating to the relevant time have been found along the Colorado River Corridor (Fairley 2004:82–88; Fairley et al. 1994:100). The major focus of research on the Early Agricultural period is to directly date cultigens to find out when they were first grown in the area and to collect other data on subsistence at sites dating to the Early Agricultural period to examine the role of cultigens in the overall subsistence strategy of the period.

I.3 FORMATIVE

The Formative period (from about A.D. 500–1300 at Grand Canyon) is defined as the time when peoples of North America domesticated crops, began making pottery, and transitioned to settled village life (Ahlstrom et al. 1993:72; Willey and Phillips 1958:146). Although maize appears on the southern Colorado Plateau, near Quemado, New Mexico, as early as 2000 B.C. (Huber and Miljour 2004), cultivation of domesticated plants in northwestern Arizona did not begin until about A.D. 500, at which time pottery making also began, the bow and arrow were introduced, and settled villages appeared (Ahlstrom et al. 1993:72; Bungart 1994a:101–102; Fairley 1989a:112). People originally lived in pit houses (essentially a roofed pit), but by about A.D. 900, they were constructing aboveground masonry houses. During the Formative period, three archaeological traditions developed in northwestern Arizona: Cohonina, Prescott, and Cerbat (see Figure I-1). In addition, the Ancestral Puebloan, Virgin Branch (or the Virgin Branch) tradition is found mainly north and northwest of the Grand Canyon, while the Ancestral Puebloan, Kayenta Tradition (or the Kayenta Tradition) tradition is found mainly south and east of the Grand Canyon.

Archaeological studies surrounding the Grand Canyon from the Arizona Strip to the Mogollon Rim and from the San Francisco Peaks to the Colorado River have resulted in several classifications of the Formative cultures in the area. Different classifications have resulted from different interpretations of the cultural history, centering on whether the Puebloan, Cohonina, Prescott, and Cerbat cultures were contemporaneous or not. Bone (2002) has a good discussion of the changing interpretations of the Cohonina.

Patayan, Upland Patayan, and Hakatayan refer broadly to the Formative traditions that existed in the region. Gladwin and Gladwin (1930) called these sites Yuman. Colton (1939) objected to the use of a linguistic term, Yuman, to designate archaeological material culture, proposing instead the term Patayan (Pai for “ancient ones”) with three branches: Cohonina, Prescott, and Cerbat.

Euler (1958, 1963) inferred that Cerbat culture, initially (from about A.D. 700–1150) restricted to the Lower Colorado River, expanded eastward and onto the Colorado Plateau after about A.D. 1150 and ultimately became the Pai culture. Euler, however, thought that the Cohonina and Prescott cultures were not closely enough related to the Cerbat to be considered Patayan. Furthermore, he argued that the Cohonina had once (prior to about A.D. 1150) extended almost all the way to the lower Colorado River on

the west and that they had been replaced by the Cerbat after about A.D. 1150. In similar fashion, Prescott culture was replaced by Cerbat culture after about 1300 or 1400.

Schwartz (1955, 1956, 1957, 1958) at one time suggested that the Cohonina were ancestral to the Havasupai. He has since adopted Euler's reconstruction (Schwartz 1989:38).

Schroeder (1979) proposed a Hakataya culture that occupied the region from the Colorado River on the north to the Gila River on the south and from the Mazatzal Mountains on the east through the Mojave Desert of California on the west, extending south into Baja California. Schroeder incorporated 11 archaeological traditions within this culture: Roosevelt, Verde, Cohonina, Prescott, Agua Fria, Gila Bend, Cerbat, Amacava, La Paz, Palo Verde, and Salton. All of these groups were highly mobile, relying on agriculture only to supplement hunting and gathering, and constructed rock-outlined jacal dwellings, made paddle- and anvil-thinned pottery, and used bedrock milling stones.

Schroeder's classification has not been widely accepted (Bone 2002:19), and most archaeologists today follow Euler's reconstruction, with modifications (see Ahlstrom et al. 1993; Fairley 2004; Fairley et al. 1994). Most archaeologists working in the Grand Canyon today accept Euler's contention that Cohonina culture once (prior to A.D. 1150) extended almost all the way from the San Francisco Peaks west to the Colorado River, that Cerbat culture replaced Cohonina culture after about A.D. 1150, moving from west to east, and that Cerbat culture replaced Prescott culture after about A.D. 1300 or 1400.

These archaeologists, however, are revising the descriptive-classificatory views of what constitutes Cohonina, Prescott, and Cerbat archaeological material cultures and the views about what it means for one archaeological material "culture" to replace another. Cartledge (1979, 1986) introduced a new way of looking at the Cohonina: in terms of communities. In a series of M.A. theses, students at Northern Arizona University have further examined the organization of communities and have begun to examine how styles of various categories of archaeological materials (flaked stone, pottery, architecture, settlement patterns) reflect cultural identity (Bone 2002; Horn-Wilson 1997; Lyndon 2005; Roberts 2001; Samples 1992).

1.3.1 Ancestral Puebloan, Virgin Branch

The Ancestral Puebloan, Virgin Branch tradition was centered on confluence of the Virgin and Colorado rivers and extended east through most of the Arizona Strip. The Puebloan cultural chronology throughout the Southwest is usually described in terms of the Pecos Classification (Kidder 1927), which divides Ancestral Puebloan cultural development into seven periods: Basketmaker II (500 B.C.–A.D. 400), Basketmaker III (A.D. 400–700), Pueblo I (A.D. 700–900), Pueblo II (A.D. 900–1100), Pueblo III (A.D. 1100–1300), Pueblo IV (A.D. 1300–1540), and Pueblo V (A.D. 1540–present). The Pecos Classification was largely developed in the Kayenta region, so the classification quite accurately reflects Kayenta culture history. The Virgin tradition developed on the edge of the Puebloan world and departs from the Pecos Classification to some degree. In the Virgin cultural chronology, for example, the Pueblo II period is usually dated from A.D. 900–1150, and the Pueblo III period is usually dated from ca. A.D. 1150–1225.

During Basketmaker II times, maize horticulture was practiced and shallow pit houses and slab-lined storage pits were constructed. Pottery had not yet been introduced to the Southwest.

During the Basketmaker III period, pit houses continued to be used, circular aboveground storage units were constructed, and plain gray ware pottery (called Mesquite Gray in the Virgin River area) and black-on-gray pottery (called Mesquite Black-on-gray in the Virgin River area) began to be produced. The bow and arrow was introduced. In most of the Pueblo world, most habitations consisted of a pit house with an arc of circular aboveground storage structures behind (north and west of) the dwelling. In the Virgin

River area, pit houses without aboveground storage structures were most prevalent (Fowler and Madsen 1986:175–179).

During the Pueblo I period, habitations in most of the Pueblo world consisted of a pit structure with an arc-shaped multi-room surface structure behind the pit structure. The pit structures were beginning to take on increasingly ceremonial functions; surface rooms were used for a variety of functions, including storage and workspace. In the Virgin River area, the most complex settlements were like Basketmaker III sites elsewhere, pit houses in front of arcs or chains of circular, slab-lined storage cists and rooms. In most of the Pueblo world, utility pottery was sometimes neck banded; black-on-white painted pottery also began to be produced. In the Virgin River area, neck banding was not as common, and the painted pottery is called Washington Black-on-gray (Fowler and Madsen 1986:175–179).

During the Pueblo II period, habitation sites in most of the Pueblo world were generally composed of a block of aboveground coursed-masonry rooms with a subterranean kiva in front. In the Virgin River area, these aboveground pueblos often consisted of arcs or chains of irregularly shaped rooms. In the heartland of the Virgin culture area, the Moapa Valley of Nevada, a large settlement known as Pueblo Grande de Nevada or the Lost City complex consisted of more than 100 individual sites (Lyneis 1996:Table 2.1), which were as large as 18 habitation rooms and 106 storage rooms arranged in chains, arcs, and circles (Lyneis 1996). Possible kivas have been reported in the Virgin culture area. In most of the Pueblo world, indented corrugated utility ware pottery and black-on-white painted pottery were produced. In the Virgin River area, the black-on-white pottery style of this period is called St. George Black-on-gray. Ceramic variability increased as the Virgin area increased, and regional variants of Virgin pottery—Moapa, Shivwits, and Shinarump wares—were developed. Moapa Gray Ware, tempered with olivine from the Mount Trumbull area, was the most distinctive ware produced by the Virgin Branch peoples during this period, and it was widely traded.

During the Pueblo III period, large, plaza-oriented pueblos began to be constructed over much of the Puebloan region. Pottery was indented corrugated, black-on-white, black-on-red, and polychrome. In the Virgin River area, the Pueblo III period was characterized primarily by the gradual end of permanent Puebloan habitation.

Permanent Puebloan habitation is not represented in the Virgin River area during the Pueblo IV period, when Puebloan populations elsewhere continued to aggregate into progressively larger pueblos in Arizona and New Mexico. During the Pueblo IV period, permanent habitation coalesced around the locations of the modern pueblos: Hopi, Zuni, Acoma, Laguna, and Rio Grande.

Although the Virgin Puebloans were adjacent to the Cohonina on the north and west prior to the spread of Cerbat culture into the area ca. A.D. 1150, the Virgin Puebloans and the Cohonina were separated by the Grand Canyon. Puebloan pottery produced by the Kayenta peoples, who lived northeast of the San Francisco Peaks, is commonly found in eastern Cohonina sites. Sherds with olivine temper were reported at Locus B of AZ G:1:10(ASM), which suggests some trade relations between the Virgin Puebloans and the Cohonina.

1.3.2 Ancestral Puebloan, Kayenta Tradition

Kayenta is the largest Ancestral Puebloan region, spanning northern Arizona, southern Utah, and southwestern Colorado. Bounded on the south by the Grand Canyon and the Little Colorado River valley, it extends up the Colorado River through Glen Canyon to the junction with the Fremont River. Some researchers call the western part of the region Virgin Kayenta, for the Virgin River in southwestern Utah and northwestern Arizona. The Kayenta region is well defined as a result of large-scale, long-term projects that have yielded high-quality information (Cordell 1997:195).

There is a wealth of data representing the Basketmaker II and Basketmaker III periods, with the unique addition of perishable wares recovered from cave sites such as White Dog Cave. Kayenta tradition follows similar development patterns found elsewhere in the Ancestral Puebloan region during these periods. The cultural markers include pit houses, Lino-style pottery, twined basketry, and one-hand ground stone. There is also little divergence from other Puebloan traditions into Pueblo I, with the continued use of pit houses, introduction of surface storage rooms of jacal or jacal-and-masonry construction, and production of Kana-a ceramics. Alkali Ridge Site 13, in southeastern Utah, is an example of a Pueblo I (ca. A.D. 750–975) period Kayenta settlement and is noted for its extraordinary size (Cordell 1997:196).

During Pueblo II (ca. A.D. 975–1150), the Kayenta Tradition population reaches its greatest geographic extent while also becoming more insular, as evidenced by the decrease in the amount of trade goods recovered from sites of this period. The adoption of smaller dispersed homesteads during this period further supports this theory. However, Dogoszhi style pottery from the Chaco Canyon region has been recovered from these sites, which suggests that while insular, the Kayenta did have outlets into the Ancestral Puebloan world (Neitzel 2007:407).

The Upper Basin Archaeological Project has greatly contributed to the understanding of the Kayenta south of the Grand Canyon during Pueblo I and II (e.g., Carter and Sullivan 2007; Sullivan 1986, 1988, 1992, 1995; Sullivan and Becher 1991; Sullivan et al. 2003). The Upper Basin is located just south of the Grand Canyon National Park (or Park) in the northeast corner of the South Parcel. Survey and excavation by the Upper Basin Archaeological Project has demonstrated that the Kayenta subsistence system consisted of a “three-tiered settlement system” (Sullivan 1995). The first tier consisted of villages occupied year-round; the second tier consisted of settlements occupied on a seasonal basis, such as field houses and one-room settlements; and the third tier consisted of sites briefly occupied during plant processing or other short-term activities (Sullivan 1995). Significantly, a one-room settlement second tier site excavated in the Upper Basin provided clear evidence of ceramic manufacturing, including an ash-filled depression with waster sherds where ceramics could have been fired (Sullivan 1986, 1988).

The Kayenta did not follow the village aggregation pattern found in other Ancestral Puebloan areas, such as Chaco Canyon and Mesa Verde, until Pueblo III (ca. A.D. 1150–1300), and maybe as late as A.D. 1250. Around A.D. 1150, there was upheaval in the Kayenta world, with the abandonment of areas such as Black Canyon and Virgin River while large pueblos were being constructed elsewhere, such as at Tsegi Canyon. These changes herald the final Kayenta occupation from A.D. 1250–1300. The Tsegi phase, as it is called, is identified by erratic settlement patterns, circular and keyhole-shaped kivas, and the production of “Kayenta style” ceramics with negative-painted designs. By A.D. 1300, it appears that the Kayenta had abandoned the landscape; however, there is evidence of cultural continuity with the middle Little Colorado drainage and other Ancestral Hopi areas (Cordell 1997:196).

I.3.3 Cohonina Tradition

Cohonina sites have been identified from the Grand Canyon on the north to the Mogollon Rim and the headwaters of the Big Chino Wash and Big Sandy River on the south, and from the Little Colorado River on the east to the Colorado River on the west. Euler (1958) found evidence of the Cohonina in the Kingman area, where it was usually present stratigraphically beneath Cerbat material and usually in association with Prescott Gray Ware (Simonis 2001).

A number of chronological sequences have been developed for the Cohonina. Colton (1939) defined three foci: Medicine Valley (A.D. 700–900), Coconino (A.D. 900–1120), and Hull (A.D. 1120–1200). Gladwin (1943) later used the term phases for Colton’s foci, a practice followed by most archaeologists today (see, for example, Schwartz [1955], who added a Hermit phase [A.D. 600–700] to the beginning of the

sequence). The range of chronological sequences for the Cohonina led Cartledge (1986) to recommend that Cohonina archaeology needed no more chronological frameworks and cultural classifications, an idea seconded by Bair (1994:269). On the other hand, Brew (1946) long ago pointed out that classifications are not an end in themselves and should always derive from the research goals of the classifier.

The Cohonina made San Francisco Mountain Gray Ware (Ahlstrom et al. 1993:73–74). The paste is sedimentary clay, which is tempered with fine quartz and feldspar sand, angular to subrounded, with some mica. The relatively thin pottery is ring-built (formed by adding thick coils to a base slab), scraped, and thinned using a paddle and anvil. Pottery types are Floyd Gray (A.D. 700–900), Floyd Black-on-gray (A.D. 700–900), Deadmans Gray (A.D. 775–1200), Deadmans Fugitive Red (A.D. 850–1150), Deadmans Black-on-gray (A.D. 900–1100), Kirkland Gray (undated), and Bill Williams Gray (undated). Ceramic compositional studies to date have not been successful in identifying production localities for San Francisco Mountain Gray Ware (Mills et al. 1993; Roberts 2001).

Schroeder (1979:Figure 9) originally defined Cohonina projectile points as being long and thin with serrated edges. Horn-Wilson (1997), however, identified 12 types of projectile points on Cohonina sites and concluded that while Schroeder's "Cohonina projectile points" were one of these types, they were not the only type made and used by the Cohonina. In his analysis of projectile points recovered from archaeological projects on the Coconino Plateau of Kaibab National Forest, Lyndon (2005) classified virtually all (n=69) of the Early Ceramic period (A.D. 400–700) projectile points as Rosegate points. Late Ceramic period (A.D. 700–1300) projectile points were mostly Cohonina points (n=43, although Lyndon did not analyze all the available specimens, since Horn-Wilson had previously analyzed them). Also dating to this period were 24 un-notched triangular points, 10 Kahorsho Serrated points, three Nawthis Side-notched points, two Parowan points, one basal-and-side-notched point, and one Sitgreaves Serrated point.

Although the Cohonina practiced limited agriculture, they primarily relied on gathering wild plants and hunting. Sites on the headwaters of the Big Sandy River, excavated during the Transwestern Pipeline project (Bair and Stoker 1994), provide some of the most recent information on Cohonina subsistence practices. Pollen samples yielded pollen of pine, cheno-ams, beeweed, purslane, Umbelliferae (parsley family), cholla, and maize. Flotation samples yielded wood of juniper, pine, saltbush/greasewood, and Apache plume. Maize was the only cultigen present. Wild plants represented in the flotation samples included seeds of juniper, dropseed, clammyweed, cheno-ams (including goosefoot), purslane, sunflower, panic grass, Deschampsia, and yucca, as well as pinyon nuts. Faunal bone from the sites represented a wide range of taxa: large mammals (including medium-sized ungulates, artiodactyls, pronghorn, deer, and bighorn sheep), medium-sized mammals (gray wolf, coyote/dog, bobcat), rabbit-sized mammals (cottontail and jackrabbit), rodent-sized mammals (prairie dog, Botta's pocket gopher, pocket mouse, grasshopper mouse, kangaroo rat, woodrat), birds (including northern flicker and roadrunner), lizards, snakes, and turtles/tortoises (including snapping turtle).

Cohonina architecture included masonry pueblos and pit houses, but they did not construct kivas. Bone (2002) investigated Cohonina public architecture ("forts," plazas and long rooms, and ball courts) on the Coconino Plateau. He divided his study area into a northern area (bounded by SR 180 on the north and east, Interstate 40 on the south, and SR 64 on the west) and a southern area (south of Interstate 40 between Interstate 40 and the Mogollon Rim). More than 200 habitation sites were present in the northern area, along with seven "forts" and five plaza sites or sites with long rooms. More than 200 habitation sites were present in the southern area, along with three "forts," one site with a plaza or long room, and four ball courts.

Cartledge (1979, 1986) proposed that the Cohonina lived in communities clustered in the woodlands around the bases of the major mountains of the Coconino Plateau: Kendrick, Sitgreaves, and Bill Williams mountains. (In addition, based on McGregor's [1967] work around Mount Floyd, a community

may also have surrounded this mountain as well.) Most communities apparently consisted of small, single-family residential sites clustering around the bases of these mountains (Cartledge 1979, 1986; Samples 1992; Wilcox et al. 1996). Within each cluster are several types of public architecture: “forts,” sites with large plazas, sites with long rooms, and ball courts (Bone 2002).

Samples (1992) and Bone (2002) identified community organization in the Sitgreaves Mountain cluster that appears to mirror that of the Medicine Valley area and, to a lesser extent, the Red Butte and Mount Floyd area, but not the other areas. Samples (1992) analyzed 380 sites in 40 square miles (64.4 km²) around Sitgreaves Mountain. The sites included 242 habitations, one rock art site, five check dams, and 132 artifact scatters. The habitation sites contained an estimated 649 structures, including 301 pit houses and 348 masonry structures.

In 1980 and 1981, Westec Services, Inc., conducted archaeological survey and data recovery in the Hualapai Valley (Schilz 1982). The archaeological survey of 12 sections of land (7,680 acres) and 51 miles of proposed roads, power lines, and pipelines identified 67 sites. Data recovery was conducted at 20 sites (Simonis 2001). The project indicated that the Hualapai Valley was occupied by the Cohonina and the Cerbat from ca. A.D. 900 to historic times. The people using the valley were camping on the dunes, probably seasonally, and farming and gathering on the dunes next to mudflats, manipulating water with check dams. The archaeologists did not excavate any structures, but they observed some depressions in the dunes that were probably shallow pit houses, basically wickiups. No masonry structures were present. The area would have had substantial food potential, with cultigens, grasses, dock, and other wild plants. The Hualapai Valley was probably home to a perennial stream until the late 1800s, when ranchers began drilling wells and lowering the water table.

Horn-Wilson's (1997) analysis of projectile points from different clusters of excavated sites on the Coconino Plateau indicated that settlement locations may have shifted over time. Early Cohonina (A.D. 850–1000) projectile points were found in four areas: Red Butte, Medicine Valley, Baker Ranch, and Mount Floyd. Late Cohonina (A.D. 1000–1075) points were found in four areas: Red Butte, Medicine Valley, Sitgreaves Mountain, and Red Lake. Very late Cohonina (A.D. 1075–1200) points were found in only two areas: Red Lake and Medicine Valley. Thus, only Medicine Valley was probably occupied throughout the Formative period, Red Butte was probably occupied in the early and late periods, Red Lake was probably occupied in the late and very late periods, Baker Ranch and Mount Floyd were probably occupied only in the early period, Sitgreaves Mountain was probably occupied only during the late period, and Mesa Butte yielded no projectile points dating to any of the three periods.

Investigations over a broad area have demonstrated the range of variability in the Cohonina tradition. Horn-Wilson (1997) found that archaeological excavations had occurred at almost 70 Cohonina sites. Forty-nine of these sites were within seven areas: Medicine Valley, eight sites (Colton 1946); Baker Ranch, five sites (Colton 1946; McGregor 1951; Spicer 1934); Mesa Butte, one site (Fiero et al. 1980); Red Butte, four sites (McGregor 1951; Schroeder 1997); Red Lake, 19 sites (Colton 1946; Fiero et al. 1980; McGregor 1951); Sitgreaves Mountain, three sites (Samples 1992; Wilcox et al. 1996); and Mount Floyd, six sites (McGregor 1967). In addition, Matson (1971) has investigated sites north of Kingman, Schilz (1982) conducted survey and excavation at Cohonina sites in the Hualapai Valley, Geib and Keller (2002) excavated a Cohonina component at Bighorn Cave, and Bair and Stoker (1994) excavated 15 Formative sites during the Transwestern Pipeline project: 14 at the headwaters of the Big Sandy River, west of Seligman, and one (Site 442-39) in the Chino Valley east of Seligman. The 14 sites at the headwaters of the Big Sandy River constitute a cluster not included in Horn-Wilson's study area; the latter site is in her Mount Floyd cluster.

In addition, many of these excavations were conducted prior to the development of modern methods of pollen analysis, flotation analysis, flaked stone debitage analysis, obsidian sourcing, and other analytical

tools that are routinely employed today. Thus, new excavations at sites in the region supplement data from previously excavated sites by gathering types of information not previously recovered.

I.3.4 Cerbat Tradition-Yuman Groups

Evidence of the Cerbat cultural tradition (primarily Tizon Brown Ware) is found from the Colorado River on the north and west to the Verde River on the east and the Bill Williams River on the south.

The tradition dates from about A.D. 700–1850 and is considered ancestral to and including the modern Pai (U.S. Forest Service [Forest Service] 1996:180). The Cerbat were primarily mobile hunters and gatherers who practiced limited agriculture and lived in natural rock shelters or constructed temporary shelters such as wickiups. Cerbat culture is defined primarily on the basis of Tizon Brown Ware.

The Cerbat are considered to be one of the western Arizona Pai groups that made up part of the Upland Patayan culture. Patayan was term that was coined by Colton for the archaeological material culture of the people who inhabited southern California, northern Baja California, and western Arizona. Populations who inhabited the lower-elevation desert areas were part of what he called the lowland groups and included the Mojave and Quechuan, among others. Their pottery included Tizon Brown and Lower Colorado Buff wares, which were paddle and anvil pottery that was similar in some respects to most Arizona wares, with the exception of Puebloan ceramics.

One view portrays the Pai and other Yuman groups as originating in southern California and Baja California. Anthropologists theorize that these groups moved into Arizona some time after A.D. 1300, gradually spreading northward and eastward (Dobyns 1974b; Reid and Whittlesey 1997). Ceramic evidence from archaeological contexts suggests otherwise, however; this evidence shows that the groups were in place sometime ca. A.D. 1000 and perhaps long before that. Their pottery appears on sites throughout the northern Mojave and upper Sonoran Deserts in Nevada, California, and western Arizona at that time. It is not known whether they had been in the region for much longer and became visible at that point in the archaeological record as a result of the adoption of ceramic technology.

The Cerbat are generally believed to be the direct ancestors of the Upland Pai groups of the Havasupai, Hualapai, and Yavapai, although the Yavapai also claim descent from the Prescott culture, whereas the Havasupai and Hualapai also claim descent from the Cohonina (Hanson 1996; McKey 1996; Simonis 1996). The relationship between the Yavapai and the Prescott culture is a matter of debate among archaeologists. This argument is based, in part, on a gap in the archaeological record between the prehistoric cultures of the area and the Protohistoric cultures observed by the Spanish.

Research on mitochondrial DNA (mtDNA) has led researchers to conclude that Upland Yuman groups such as the Yavapai may have had their origin in Arizona–New Mexico rather than southern California (Malhi et al. 2003). Other genetic studies demonstrate a high frequency of the same Albumin Mexico gene in Upland Yuman and Pima groups (Schell and Blumberg 1977). Linguistic evidence further suggests a concordance between Upland Yuman and Piman. Far less of a link can be established between the Upland and Lowland Yuman groups. All of this evidence, combined with other lines of proof from throughout the Southwest, suggests successive early and pre-ceramic migrations of linguistically and genetically related people from northern Mexico into adjacent areas. Sometime later, the Patayan Ceramic tradition spreads, from south to north, into entire region (Rogers 1936, 1945; Seymour 1997; Stone 1991; Waters 1982).

Cerbat and Prescott peoples may have contributed to a relationship analogous to that of the various groups of Yuman-speaking peoples at the far western edge of Arizona. Each of these different Lowland groups relied on agriculture to varying extents. Where extensive areas for agriculture were available, some groups relied on agriculture, supplemented by gathering wild plants and animals. Other areas along the

river were less conducive to farming, so populations there relied primarily on hunting and gathering, supplemented by farming or trade with those other agriculturally based groups (Braatz 2003; Khera and Mariella 1982; Steward 1983; Stone 1991). Upland groups often traded upland resources such as acorns and pine nuts for corn and squash with lowland people, or in some cases, reciprocal use of territories was allowed by select Upland and Lowland groups.

The best example of this is the relationship between the Tolkepayas (westernmost Yavapai) and the Quechans (Lowland Yumans). The Tolkepayas periodically settled in Quechan territory along the Colorado River where they would seasonally plant crops. The Quechans would, on occasion, venture into Tolkepayas territory in the mountains where they would hunt game and collect raw materials for grinding stones (Braatz 2003:33–34).

Analogous to the above relationships, the Cerbat were known to occupy marginal areas where agriculture was risky even in the best of times, while the Prescott peoples lived in zones where agriculture normally could be practiced. When climatic conditions were good for agriculture, some Cerbats would have moved in with their Prescott relatives for trade and intermarriage. When climatic conditions were not compatible with high agricultural productivity, the more sedentary Prescott peoples probably increased their reliance on wild resources temporarily abandoning fields to join the Cerbats. Droughts throughout the Southwest in the thirteenth and fourteenth century might have severely limited the agricultural potential of the Prescott area. This created a situation where some Prescott culture farmers had to abandon agriculture and integrate into the Cerbat bands. Others may have joined Puebloan groups in the Little Colorado River valley.

Cerbat sites have been identified from the Grand Canyon on the north to the Bill Williams River and northern Phoenix Basin on the south and from the Verde River on the east to the Colorado River on the west. Euler (1963) divided Cerbat cultural history into three periods: 1) the Desert period (A.D. 700–1150), when the Cerbat lived in lowland areas west of the Grand Wash Cliffs; 2) the Expansion period (A.D. 1150–1300), when the Cerbat expanded eastward onto the Colorado Plateau; and 3) the Stability period (A.D. 1300–1850), when the Cerbat and Pai lived in the region where they were observed at first contact with Europeans.

The Cerbat practiced limited agriculture and relied heavily on the gathering of wild plants and hunting. Based on both ethnographic and archaeological data, Matson (1971), Swarthout (1981:63–74), and Wright (1993:16) have hypothesized the following reconstruction of Cerbat and Pai subsistence and settlement. In the winter, small groups of Cerbat and Pai, generally three or four families, established base camps near water sources. In the spring, they dispersed into smaller groups of only two or three families to collect agave, grass seeds, and other wild plants from valley floors and upper bajadas. In the summer, they dispersed still further into groups of only one or two families to collect cactus fruits and mesquite beans, which they processed and cached for use during the winter.

Stone tools found on Cerbat sites include scrapers, knives, triangular basal- and side-notched projectile points, and shallow-basin grinding slabs (Euler 1963:83). Basketry was coiled and twined (Euler 1963:83). Cerbat pottery, Tizon Brown Ware, is reddish brown with granitic rock and granitic sand temper or quartz and feldspar sand temper. Tizon Brown Ware has coiled construction, thinned by scraping and paddle and anvil (Clauss 2001). Tizon Brown Ware is divided into eight types: Cerbat Brown, Cerbat Red-on-brown, Cerbat Black-on-brown, Aquarius Brown, Aquarius Black-on-brown, Sandy Brown, Tizon Wiped, and Orme Ranch Plain (Goetze and Mills 1993:82). Although Griset (1996) directly dated carbon residue on examples of Tizon Brown Ware from southern California to as early as A.D. 545–950, Arizona examples of the ware are poorly dated. Based on the association of Tizon Brown Ware with Lino Gray pottery at Willow Beach (Schroeder 1961), Clauss (2001) suggests that the ware could date to as early as A.D. 700 in Arizona, although he also proposes a beginning date between A.D.

1100 and 1500. Goetze and Mills (1993:82) date the ware after A.D. 1300. Except for Orme Ranch Plain, individual types are not more precisely dated.

Bighorn Cave (Geib and Keller 2002) yielded perhaps the broadest range of Formative material culture of any site in the region from the Grand Canyon to the Bill Williams River and from the San Francisco Peaks to the Colorado River. The assemblage from Bighorn Cave also exemplifies the admixture of cultural traditions in northwestern Arizona during the Formative period. The Formative (cal. A.D. 550–1200) occupation at Bighorn Cave was represented by seven pits and five hearths, along with flaked stone, ground stone, small amounts of pottery, perishables, and human coprolites. Pits were used for storage; several were lined (including one lined with juniper bark). Maize, beans, and squash were present. Wild plants represented by macrobotanical specimens included phragmites, Indian rice grass, dropseed, juniper, buffalo gourd, prickly pear, ceroid cacti, century plant (agave), screwbean mesquite pods, sedge corm, walnut, and mustard. Yucca, agave, and beargrass were used to make artifacts, including two-warp plain-weave sandals and cordage. Wooden tongs, perhaps used to handle cactus, were found. Quids (wads of chewed agave fibers) indicated consumption of agave during this period.

Human coprolites contained mesquite pods, prickly pear stems, yucca buds and flowers, and goosefoot and mustard seeds. A bone bead necklace was also recovered from deposits dating to this occupation. Flaked stone, which included an obsidian arrow point, indicated that although the bow and arrow had been introduced at this time, plant processing was the focus of the Formative occupation of the site.

Three sherds of San Francisco Mountain Gray Ware were present, but only one sherd was from contexts securely dated to the Formative occupation. Lower Colorado River Buff Ware (two sherds of Topoc Buff [A.D. 1000–1300] and three sherds of Parker Buff [A.D. 1050–1800]) were also recovered from the site. Geib and Keller view Bighorn Cave as having been occupied seasonally by Lower Colorado River peoples, harvesting wild plants when they were not farming. As summarized by Geib and Keller, ethnographies describe the Lower Colorado River peoples as being only partly dependent on farming and as living seasonally on the Lower Colorado River in impermanent settlements. They would plant crops on the muddy floodplain after the spring floods, then live in the uplands while the crops matured, then move back to the river for harvest and for the winter, returning to the highlands when the river rose again in the spring.

The site of Boulder Springs, south of Kingman in the Hualapai Mountains, evidenced at least three occupations: ca. A.D. 800 or 900, ca. A.D. 1000 or 1050, and ca. A.D. 1100 or 1150 (Hewitt 1974). The 3,059 sherds from the sites were overwhelmingly Tizon Brown Ware (2,244 sherds), but 330 Lower Colorado River Buff Ware sherds indicated visits by or trade with members of the Lower Colorado River tribes, 72 Prescott Gray Ware sherds represented relations with the Prescott area, 316 San Francisco Mountain Gray Ware sherds represented the Cohonina, 13 San Juan Red Ware sherds were imported from the San Juan River area near the Four Corners, and 12 Tusayan White Ware sherds were imported from east and north of the Little Colorado River (74 sherds could not be identified to ware).

As mentioned above, for the Transwestern Pipeline project, Bair and Stoker (1994) excavated 14 Cohonina/Cerbat sites on the headwaters of the Big Sandy River. The sites were in two clusters: one cluster of seven sites on Muddy Creek and one cluster of seven sites on Willow Creek.

I.3.5 Formative Period Summary

During the Formative period, peoples of the Cohonina, Prescott, and Cerbat cultures used the region from the Grand Canyon south to the Mogollon Rim and Bill Williams River and from the San Francisco Peaks west to the Colorado River. Archaeological sites in the region have yielded evidence that peoples of three neighboring traditions—the Virgin Puebloans, the Kayenta Region Puebloans, and the Lower Colorado

River tribes—traded with the Cohonina, Prescott, and Cerbat peoples in the region during the Formative period.

The Kayenta tradition developed east of the Cohonina, in the region north and east of the Little Colorado River, west of the Chuska Mountains on the Arizona–New Mexico border, and south of the San Juan River. The Kayenta tradition developed out of local Archaic culture and was one of the direct antecedents of modern Hopi culture. Maize was being grown in the Kayenta region by 1000 B.C. (Gilpin 1994; Smiley 1994). The Kayenta people made Tusayan Gray Ware, Tusayan White Ware, and Tsegi Orange Ware (Colton and Hargrave 1937; Hays-Gilpin and Van Hartesveldt 1998; Mills et al. 1993).

The Virgin Branch tradition centered on the confluence of the Virgin and Colorado rivers and extending east across much of the Arizona Strip (the portion of Arizona north of the Grand Canyon). The Virgin tradition probably developed out of local Archaic culture beginning as early as 300 B.C. and continued until ca. A.D. 1200 (Forest Service 1996:14). Much of their gray ware and white ware pottery was similar to Puebloan pottery of the Kayenta tradition or was imported from the Kayenta area (to the east and north of the confluence of the Little Colorado and Colorado rivers). The Virgin Branch made Moapa Gray Ware and Moapa White Ware using olivine temper from the Mount Trumbull area (Bungart 1994a:102; Lyneis 1992, 1995; Samples 1992; Seymour 1997, 2000, 2001, 2004).

As mentioned above in the discussion of Bighorn Cave, the Lower Colorado River tribes practiced farming on the floodplain of the Lower Colorado River, living in temporary villages on the floodplain during the winter, moving to the highlands when the river flooded in the spring, planting crops in the river bottom after the spring floods, living in the uplands while the crops matured, and returning to the river to harvest crops and set up their winter residences. The Lower Colorado River tribes produced Lower Colorado River Buff Ware pottery, which comprises five types (Seymour 1997; Waters 1982).

I.4 PROTOHISTORIC AND HISTORIC AMERICAN INDIANS

I.4.1 Hualapai, Havasupai, and Yavapai

The period from A.D. 1300 to the permanent colonization of the area by Euro-Americans (ca. A.D. 1850) is designated the Protohistoric period. Pai (Hualapai and Havasupai) and Paiute use of the Grand Canyon region, which began after ca. A.D. 1300 (Euler 1958:65–66), was a hunting-and-gathering adaptation supplemented by agriculture (Ahlstrom et al. 1993:82). Although some locations were occupied year after year, dwellings were impermanent wickiups that were rebuilt each year. As mentioned above, the Pai manufactured Tizon Brown Ware; they also made a distinctive triangular projectile point with two notches on each side (Bungart 1994b:64, Figure 4r–t). Euler (1958) excavated 10 sites ranging in date from A.D. 500 to the early twentieth century. Euler’s archaeological excavations traced the transition from prehistory to history among the Hualapai (Euler 1958).

At Bighorn Cave (Geib and Keller 2002), the Late Prehistoric–Protohistoric period (cal. A.D. 1300–1700) was represented by one pit and one roasting pit, along with flaked stone, pottery, and perishables. Among the flaked stone was a Desert Side-notched projectile point. The 14 sherds of Tizon Brown Ware included seven sherds of Cerbat Brown and seven sherds of Aquarius Brown. A Jeddito Black-on-yellow sherd, collected by looters, dates to this occupation and demonstrates trade relations with the Hopi pueblos more than 200 miles to the east. A crude split-twig figurine was also directly dated to this time and was interpreted as an imitation of Archaic figurines.

The Hualapai, Havasupai, and Yavapai languages are a group of related Upland Yuman languages (Kendall 1983). The Hualapai lived in an area bounded by the Colorado River on the north, the Bill

Williams and Santa Maria rivers on the south, the Coconino Plateau on the east, and the Black Mountains on the west (McGuire 1983). The Hualapai were divided into 13 to 14 bands, which were then divided into three larger groups (Dobyns and Euler 1976:16–18). They mixed gardening with hunting and gathered wild plants. Throughout the year, they exploited various resources as they became available. For example, agave would be available in the late spring; in the summer, saguaro fruit would be harvested from Big Sandy Valley and grasses from upland valleys; and in the fall, pinyon nuts would be gathered from the Hualapai Mountains and mesquite from the various canyons (Kroeber 1935; Martin 1985). In addition, during the summer they lived in villages along major streams (such as Matawidita Canyon and Big Sandy Valley) and raised corn, beans, squash, and pumpkins in irrigated fields (Dobyns 1956, 1974a; Euler 1958; Kroeber 1935; McGregor 1935; Spier 1928). The amount of farming versus hunting and gathering may not have been consistent across all the Hualapai and would have varied, depending on how much arable land was within the territories of each group of Hualapai (Martin 1985).

The Hualapai were driven from much of their homeland as a result of conflict with the U.S. Army during 1866–1869, after which they were placed on various reservations, culminating in their current reservation on the south side of the Grand Canyon, which was established in 1883 (McGuire 1983:27). One small (ca. 60-acre) outlying reservation is located on the upper Big Sandy River, just below the confluence of Knight and Trout creeks.

The Hualapai refer to the springs at Grand Canyon West Ranch as *Tanyika Ha'a* (Grass Springs). They held a Ghost Dance at Tanyika Ha'a in 1889 (Dobyns and Euler 1967; Simonis 1998, 2001; Stoffle et al. 2000). Ghost Dances were also held on the plateau near South Parcel by the Hualapai and the Havasupai. The Ghost Dance was a revitalization movement that began among the Paiute and swept through the American Indian tribal communities of the western United States during the late nineteenth century (recently, the movement has been experiencing a rejuvenation, as well). *Wevoka* (the Prophet), who founded the religion, was present at the 1889 Ghost Dance at Tanyika Ha'a.

During the Protohistoric period, the Havasupai's traditional territory stretched from the Grand Canyon south to Bill Williams Mountain and from the Aubrey Cliffs to east of the Kaibab National Forest (Schwartz 1983). Like the Hualapai, there are several theories of the origins of the Havasupai. Schwartz (1955, 1956) posited that they were the descendents of the Formative period Cohonina. Others theorize that both the Hualapai and the Havasupai are the descendents of the Formative Period Cerbat peoples (Euler 1958). During the Protohistoric period, the Havasupai and the Hualapai were then a single tribe; the Havasupai were a band of the larger Pai group that later split off as a result of historical circumstances (Dobyns and Euler 1970; Euler 1958; Kroeber 1935; Stewart 1966). Like the Hualapai, they relied on farming within canyons as well as hunting and gathering on the plateau (Martin 1985; Schwartz 1983).

Early Spanish explorers and later European explorers had some contact with the Havasupai (Dobyns and Euler 1970; Schwartz 1983); however, was not until the nineteenth century that they began to feel real pressure from settlers and miners. In the late nineteenth century, ranchers began to demand more land for cattle grazing in the area used by the Havasupai. In addition, the copper deposits in Havasu Canyon were attracting the attention of miners (Schwartz 1983). Under pressure from the ranchers and miners, the U.S. government established a reservation within Havasu Canyon in 1880; a school and a Bureau of Indian Affairs agency office were established in 1895. The government encouraged the Havasupai to remain in the Canyon year-round and abandon their use of the plateau (Hirst 2006; Schwartz 1983). Although the Havasupai had all but abandoned their traditional hunting and gathering territory by the 1940s, in the 1970s they fought to re-establish territory outside Havasu Canyon. The Havasupai fought for their right to include plateau lands in their reservation and won an expansion of their reservation in 1975 (Hirst 2006).

The Yavapai were one of the primary users of northwest-central Arizona during what is referred to as the Protohistoric period (A.D. 1500–1820). They relied predominantly on hunting and gathering but also practiced some floodwater farming (Braatz 2003; Gilpin and Phillips 1999:66). By the end of the

sixteenth century, the Spaniards had made a couple of brief forays into Yavapai territory (Braatz 2003:34–35). By the eighteenth century, the Western Apache had formed a cooperative relationship with the Yavapai and were residing in the Prescott area (Gilpin and Phillips 1999). Fur trappers exploring the Verde Valley in the early 1800s reported that both groups were in the valley (Motsinger et al. 2000). The Apache and Yavapai traded with one another, often collaborating in raids against common enemies, particularly the Pima and Maricopa. Intermarriage sometimes occurred between Apache and Yavapai. When confined to the White Mountain Reservation, intermarriage of these two groups was common (Braatz 2003). The genetic studies mentioned above support these historic accounts about intermarriage between the Yavapai and Apache (Malhi et al. 2003).

By the nineteenth century, the Yavapai themselves comprised four subgroups: Tolkepayas, Yavapés, Wipukepas, and Kwevképayas. The Yavapés occupied the Prescott area. Each subgroup was composed of a number of small bands that varied in size throughout the year. Size was dependent on the availability of resources, such as water, plants, and animals. Although every band made its own alliances, the Tolkepayas, Yavapés, and Kwevképayas all shared a common enemy in the Pima and Maricopa during this century (Braatz 2003). However, years earlier, they had had a civil relationship with these two groups. The Kwevképayas and the Apache were strong allies. The northern Tolkepayas, northern Yavapés, and Wipukepas all shared a common enemy in the Havasupai. Yavapai consultants reported that, not unlike what had happened with the Pima/Maricopa relationship, the Havasupai, Hualapai, and Yavapai had been close friends until an argument over a child's game created enmity between the Yavapai and the Havasupai and Hualapai (Braatz 2003). As mentioned above, the Tolkepayas and the Quechans in the Colorado River valley enjoyed a relationship of mutual benefit.

I.4.2 Southern Paiute

During the seventeenth century, Spain colonized most of western North America, expanding as far north as present-day California, Arizona, New Mexico, and Texas. Eager to exploit the resources of the new territory, trappers, miners, and missionaries entered these lands and met the inhabitants. Of the many who came to the new world, very few explored the area known as the Arizona Strip, preferring the moderate climate of Santa Fe or the ocean access afforded by California. Those who did pass through the Arizona Strip encountered a people living a subsistence lifestyle in bands of 10 to 50 people (Knack 2001:20).

At contact, the Southern Paiute existed as a dispersed band of kinship-based groups moving seasonally along the landscape. While they subsisted mainly from hunting and gathering, there is ethnographic evidence of small-scale agriculture of squash and corn along riverbanks (Knack 2001:15). Groups would maintain resource areas and use what was locally available to them. There is no ethnographic or written evidence of conflict or warfare among the Paiute or their neighbors prior to contact (Knack 2001:15). Consultants assert that the Paiute would share resources in times of environmental stress and would join other bands until the conditions improved (Knack 2001:15).

The arrival of Europeans had many negative effects for the Kaibab Paiute. Most evident is the loss of life as a result of diseases brought to the New World by the Spanish. The lack of immunity and effective medicines left the Paiute defenseless against the diseases that decimated their population (Fairley 1989b:160). The Spanish had further impacts on the culture through the encouragement of the slave trade, which put the Paiute on the defensive against the neighboring Ute tribe and the more distant Navajo. Normally a peaceful people, the Paiute were not able to adequately defend themselves against the raiding parties. The passage of the Spanish Trail through their homeland made the Paiute a convenient target for the caravans of traders traveling between New Mexico and Arizona. The caravans also brought with them large herds of sheep and horses. The intensive use by livestock despoiled the area around major springs. As a result of these impacts, it was observed that by the early 1800s, some traditional resource areas had been abandoned by the Paiute (Fairley 1989b:160).

The end of the Mexican–American war in 1848 brought a flood of new immigrants to the Southwest from the East. Between 1852 and 1864, Mormon settlers moved into the Arizona Strip region and developed mission communities in the Paiute homelands. The Mormons had established settlements at Short Creek, Pipe Springs, Moccasin Creek, and at Beaver Creek Dam by 1866 (Fairley 1989b:165). Initially, the Paiute welcomed the Mormons, as they hoped that the Mormons would provide a buffer between them and the hostile Ute. However, the peaceful coexistence did not last long, as Mormon cattle ranching destroyed Paiute gathering lands, and they were reduced to begging or stealing cattle to survive.

The interactions with the Mormons initiated cultural changes in the Paiute community. Many converted to the religion in order to obtain goods and gain a share of the Mormons' resources. Those who did not convert formed chiefdoms, a new concept for the traditionally loosely banded group, to facilitate negotiations with the settlers (Stoffle and Evans 1978:18). Almost all Kaibab Paiute people adopted a new material culture that reflected the lifeways of the settlers. Glass, iron, and steel replaced traditional weaponry materials, and guns became commonplace. Pottery and baskets were replaced by iron and brass containers. Breechcloths and apron skirts traditionally worn by the Paiute were replaced by clothing cast off by the Mormons (McKoy 2000:23).

The U.S. government was made aware of the deteriorating conditions in the Arizona Strip by John Wesley Powell, who made contact with the Southern Paiute during his expedition down the Colorado River in 1869 (Fairley 1989b:176). He was distressed by the condition in which he found the Paiute and propositioned the U.S. Special Indian Agent in 1872 for assistance on their behalf. Powell's notes state, "The Kaibabits are camped three miles from me . . . and I find them in a truly suffering condition. They have exchanged their ornaments and clothing for food and do not have enough" (Fairley 1989b:183). The results of investigations on behalf of the U.S. government were to place the Paiute on the Moapa Reservation created in 1873 in Nevada. The Kaibab Paiute refused to go and faced even more dire straits as a result. By 1880, Jacob Hamblin, a Mormon explorer, sent a note to John Wesley Powell regarding the Kaibab Paiute in which he described them as "destitute" and noted how ranching had destroyed the fertile landscape on which they once thrived (Fairley 1989b:184).

The creation of National Parks and Reserves in the Arizona Strip increased the stress on the Paiute by denying them access to traditional hunting and collecting areas (McKoy 2000:66). The area around Buckskin Mountain was declared a National Reserve in 1893 (McKoy 2000:66). Special Agent James A. Brown noted that "formerly the Buckskin Mountain afforded excellent hunting ground, but since that has been made a forest reserve the Indians have been shut off . . . Deer are very plentiful on the Buckskin Mountain, and before it was made a reserve these Indians obtained most of their living from that source" (Brown [1903], cited in McKoy 2000:66). This occurred again in 1906, when President Roosevelt declared the Grand Canyon a National Reserve.

Conditions for the Kaibab Paiute remained dire until 1907, when they received a 12 × 18–mile tract of land at Moccasin and Pipe springs from the federal government (Fontana 1998:40). Prior to the official decree, the Paiute had received a small parcel of land and some water rights outside the settlement of Moccasin from the local Mormon community. In 1904, when a special agent to the Kaibab from the government visited the area, he found they had irrigation ditches along Moccasin Springs that supported small-scale agriculture and provided them with a meager means of subsistence (McKoy 2000:51).

The reservation lands provided the Paiute with a means of survival, even if it meant the end of traditional lifeways. At the time, there were about 80 Paiutes in the Kanab area who moved onto the reservation. The federal government set up irrigation pipes, provided cattle, and supplied a school building to the new residents. By 1914, Henry W. Dietz, Superintendent of Irrigation, notes that the Paiute were engaging in dry and irrigation ditch agriculture and cultivating corn and alfalfa (McKoy 2000:77). They were also moderately successful in cattle ranching.

As the region developed, the boundaries of the reservation became a topic of contention. Demands for access to resources and land by the settlers often put the Paiute on the losing end of government deals. In 1913, the General Land Office decided to exclude the town of Fredonia from the limits of the reservation at the request of the townspeople. Extracting it from the reservation allowed the people in the town to make claim to the land for themselves (McKoy 2000:76). The creation of public water reserves within ¼ mile of Canaan Reservoir, Two Mile Spring, and Pipe Spring in 1915–1916 further diminished the Kaibab Paiutes' acreage (McKoy 2000:78). In 1917, the Kaibab Paiute were permanently assigned 120,413 acres in Northern Arizona by President Woodrow Wilson.

In 1923, the National Park Service (NPS) created Pipe Spring National Monument. The Director of the NPS, Stephen Mather, wanted a roadway that would connect Zion National Park with Grand Canyon National Park. Mather envisioned tourists using Pipe Spring as a rest stop on their way between the two large parks (McKoy 2000:94). The ownership of the land and water at Pipe Spring was under dispute, as a local man claimed his family had rights prior to the establishment of the Paiute Reservation there. Maher took advantage of the murky legal situation to rush the establishment of the Monument into legislation. He was able to obtain 40 acres for the National Monument with little regard to the Kaibab Paiute, as “the Indians have no special need for the land,” according to Commissioner Charles Burke of the Office of Indian Affairs (McKoy 2000:105). In 1924, the sale of land was completed, despite objections by Dr. Edgar Farrow, the government agent to the Kaibab Paiute at that time, who contested the government's right to obtain the land and water rights from the reservation (McKoy 2000:137). Disputes over water rights would continue well into the 1930s, as the Paiute, NPS employees, and cattle ranchers fought for the right to use Pipe Spring.

The enforcement of Paiute water rights to one-third of the Pipe Spring flow made agriculture a difficult endeavor. A drought that lasted through the 1920s and 1930s, coupled with the Great Depression, made life even more difficult for the Paiute. There was no work outside the reservation as there previously had been. While they did own cattle, their success was minimal and often fraught with land and water conflicts with outside cattle ranchers (McKoy 2000:192).

Outside industries offered the Kaibab Paiute a chance to make an income when their land was not producing. Women sold buckskin and baskets to the tourists passing through Pipe Spring National Monument and took jobs working as maids in hotels. When Hollywood needed backdrops for their Western films, the Kaibab rented land to them and worked as extras on the set. Others took jobs working for the Civilian Conservation Corps (CCC).

The trend of leaving the reservation to look for work continued into the World War II (WWII) era, which saw a migration of Paiute to major cities. Few Paiutes enlisted in the military, but many worked in support service jobs. Most would return to the reservation, eventually feeling that their homeland was the Arizona Strip (Knack 2001:243).

Post-WWII, the federal government instituted many policies that profoundly affected American Indians living on reservations. The Indians Claims Commission Act of 1946 allowed tribes to sue for reparations as sovereign entities for loss of land, unfulfilled treaty obligations, and other claims against the federal government. By 1951, five bands of Southern Paiute tribes, including the Kaibab, filed suit against the federal government for loss of traditional land as a result of unlawful seizure and malfeasance (Knack 2001:246). The amalgamated tribes were successful in their lawsuit and received an \$8.25-million settlement in 1964 (Knack 2001:248).

The Kaibab Paiute, in order to join in the lawsuit, had to create a leadership position to represent them in legal matters. As a result, in 1951, they created their first tribal council under the provisions of the Wheeler-Howard Act (1934), which is more informally known as the Indian Reorganization Act. The Act encouraged the creation of a constitution that would have to be approved by the federal government.

In 1965, the Secretary of the Interior approved the Kaibab Paiutes' constitution, thereby making them eligible for federal funding and providing the tribe with a structure for self-government.

I.4.3 Navajo

According to archaeologists and historians, the Navajo, or Diné, are latecomers, compared with other groups in the Southwest; however, according to Navajo culture history they have been here since they first emerged into this world. This disparity of opinion has made specifying when the Navajo arrived difficult; the following account discusses the opinion of archaeologists and historians and does not represent the only version of how the Navajo came to the Southwest. Arriving in the Four Corners region sometime between the fourteenth and sixteenth centuries, the Navajo speak an Athapaskan language that is closely related to populations in western Canada (Correll 1976; Haines 2003; Haskell 1987; Jett and Spencer 1981; Reed and Reed 1996). Debate is centered on the time frame and actual route taken, but most consider the evidence to suggest that the migration started as early as A.D. 1000. Archaeological evidence suggests that they arrived as early as A.D. 1500 (Brugge 1983; Wilcox 1981) and were highly mobile hunters and gatherers. With the intrusion into the region by the Spanish in the subsequent two centuries, the Navajo acquired sheep, cattle, and horses. Some postulate that the Navajo adopted farming after the Puebloan revolt (Haines 2003); however, early Spanish accounts describe the Apaches de Nabajó as a semi-nomadic people who practiced limited agriculture (Brugge 1983). Regardless, by the late 1600s, warfare with the Spanish had forced the Puebloan people to seek refuge with the Navajo, creating a blending of cultures (Brugge 1983).

Warfare with the Utes had forced the Navajo to retreat farther into eastern Arizona by the end of the 1700s, and warfare with the Spanish flared up in the late 1700s, when the Navajo forced out Spanish settlers (Brugge 1983). After the Mexican independence in 1821, many Navajo were captured by slave traders as guns became more available to the traders. Conflicts between the New Mexicans and the Navajo increased into the 1830s and 1840s. With the Treaty of Guadalupe Hidalgo in 1848, the United States acquired California and much of what is now known as the Southwest from Mexico at the end of the Mexican-American War. Soon after, U.S. troops entered Navajo territory.

The Navajos had several violent conflicts with U.S. troops in the following years. These conflicts, the lack of protection from slave raiders, and land pressures created distrust between the Navajo and the U.S. government (Roessel 1983). In 1860, the Navajo attacked and almost captured Fort Defiance; this led to a call for action against the Navajo. In 1863, the U.S. military, headed by General James Carleton and Colonel "Kit" Carson, began a campaign to deport the Navajo to Fort Sumner in New Mexico. The subsequent "Long Walk" resulted in the death of hundreds of Navajo during this forced march. As many as 8,500 Navajos were held at Fort Sumner until 1868 (Roessel 1983). Once they were released, they returned to the Four Corners area but found it greatly reduced in size. Only about 10% of the traditional use area was available. Through the late 1800 and 1900s the Navajo manage to acquire more of the land, but it was still less than the area they had originally occupied. When the railroad cut through their lands, they built trading posts to capitalize on tourism and the increasing demand for Navajo weaving and silverwork in the late 1800s and early 1900s.

Unlike other Indian tribes across the United States, the Navajo increased their population significantly during this period. To support these many more people, herds of sheep increased in size and numbers, and by the 1930s, erosion problems were severe. In response, the federal government ordered mandatory sheep reductions between 1935 and 1940 (Kelley 1986). The numbers of stock were reduced by one-third. New Deal jobs provided jobs for the livestock-less Navajo.

The Navajo did not officially become U.S. citizens until 1924 and could not be drafted, so they did not fight in great numbers during WWI. During WWII, however, many Navajo signed up to fight for their

country after the attack on Pearl Harbor. The best known Navajo soldiers were the “Code Talkers:” U.S. Marines who used the Navajo language as a basis for sending messages (Oswalt 2006:367).

Wage jobs increased until the late 1940s, and the end of WWII brought on a recession. Federal and mining jobs filled some of the gaps, but because of ever-increasing populations, unemployment has continued to be a problem.

Traditionally, the Navajo maintained at least two seasonally occupied camps. Occupied in either the summer or winter, they were composed of at least one permanent structure and several temporary ones. Families would move between the camps, focusing on agriculture, collecting, and/or herding sheep. Depending on the resource focus, camps would be composed of various structures. According to Cleland et al. (1992) and Haines (2003), temporary camps were the most common types of sites on the Coconino Plateau.

Prior to the Historic period, the Navajo manufactured basketry and gray to black utility ware ceramics for use cooking, collecting, and storing. These items were no longer in use during the Historic period, when metal and glass containers became available. Following the introduction of sheep in the seventeenth and eighteenth centuries, the Navajo became skilled weavers. Besides the usefulness of having Navajo blankets and rugs around the camp, their talents became highly sought after for the tourist trade. Jewelry manufacture became commonplace during the early twentieth century, and the Navajo became expert silversmiths.

According to Haines (2003), there is some debate about the earliest occupation of the Coconino Plateau. Dendrochronological samples used by the Indian Claims Commission in the 1960s suggest that timbers used in Navajo construction dated to as early as the late 1700s. Euler (1974), however, discounts these early dates, suggesting there was a problem with old wood. He believed that the Navajo first began to appear in small number in the 1860s but were not well established until the 1890s. More recently, other scholars have reviewed the evidence and have come to the conclusion that in fact Navajo settlement was established in the 1700s (Roberts et al. 1995). In any event, some Navajo families made their way onto the plateau in the 1860s as a result of the conflict with the U.S. military and to avoid capture and relocation to Ft. Sumner. By the 1890s, some Navajo had become established along the eastern edge of the Grand Canyon and Coconino Plateau (Euler 1974). Once the Grand Canyon Forest Reserve was established in 1893, the government evicted the Navajo from that area and prohibited sheep grazing in the plateau. As a result of conflicts with Euro-American ranchers over water and lands, the boundary of the reservation was extended twice to alleviate this problem. The first time was in 1900 to the Little Colorado; it was extended again in 1930 to its present boundary along the edges of Grand Canyon National Park and Kaibab National Forest.

Beyond grazing activities, the Navajo seasonally frequented the plateau for pine nut harvests (Cleland et al. 1992). Early collection of these nuts was probably restricted to consumption by family members. More recently, however, they have been collected for sale to others as a source of income.

I.4.4 Hopi

The area of the villages at Hopi has been continually occupied for at least 1,000 years. Beginning in the late thirteenth and early fourteenth century, people moving into the Pueblo area (including New Mexico) had established several large towns on Antelope Mesa, although it is unclear whether these towns were Hopi (Brew 1979). By the time the Spanish arrived in the sixteenth century, many of these towns had been abandoned and most Hopi settlement could be found on Black Mesa; those pueblos on Antelope Mesa that were not abandoned were Hopi as well. The Hopi were primarily agriculturalist; cultivating corn, beans, and squash on the lands surrounding their mesa. While they were primarily dry farming

maize and beans, they did also practice flood agriculture and irrigation farming (Brew 1979). After the initial sporadic contact of Spanish explorers in the sixteenth century, Spanish missionaries established churches at several pueblo communities in New Mexico and Arizona, including the Hopi pueblo of Awatovi (Brew 1979; Clemmer 1995:29). The missionaries were initially successful at Awatovi; they converted many Hopi after the miraculous healing of a blind boy by a cross. Missions established at Oraibi and Shongopavi were less successful; however, the presence of the Spanish brought new material goods such as axes, saws, cloth, and sheet tin to the Hopi towns (Brew 1979). Most of the Hopi continued to resist conversion to Christianity. This resistance to conversion and Spanish influence in general led them to participate in the Pueblo Revolt of 1680 (Clemmer 1995:30; Rushforth and Upham 1992:104). The Hopi destroyed the churches and killed the five Spanish priests in their villages (Brew 1979). The Hopi remained relatively isolated after the revolt; although there were several attempts to conquer the Hopi, the Spanish never re-established themselves at Hopi (James 1974:59–70).

After Mexican independence, the Navajo increased their raiding activities on the Hopi, taking livestock and selling it to dealers to the east (James 1974:71–72). The Navajo even managed to drive off or kill most of the inhabitants of Oraibi in 1837. Other tribes and Mexicans also conducted raids on the Hopi for food, livestock, and slaves (James 1974:72).

The U.S. took control of the Southwest after the Mexican-American War. After 1850, the Hopi began to feel pressure from the influx of new settlers, primarily in the form of smallpox epidemics that greatly reduced the Hopi population (Dockstader 1979). Navajo raiding on the Hopi and droughts were also having an impact on Hopi life (Clemmer 1995:36). As a result, the Hopi helped the U.S. government as Army volunteers to capture and move the Navajo out of Pueblo territory (James 1974:80–81). In the 1870s, new missionaries from the Moravian, Mormon, and Baptist churches established churches in or near Hopi towns (Bailey 1948:349; Clemmer 1995; Dockstader 1979). Not long after, white settlers began to encroach on Hopi lands. Several towns were established by Mormons, and the Atlantic and Pacific Railroad (A&PRR) was built south of Black Mesa (James 1974:100). It was recommended that a reservation be established to stop the encroachment.

The Hopi reservation was established in 1882 on 2.45 million acres; however, this was done without consulting the Hopi, and little was done to enforce the boundaries once they were established (James 1974:101). The U.S. government increased its presence at Hopi with schools and Bureau of Indian Affairs offices. Factionalism between those opposed to the outside influence and those in favor of it eventually led to a split in the tribe at Oraibi in 1910 (Clemmer 1995:110; Dockstader 1979; Rushforth and Upham 1992:127–129; Titiev 1944:110). During the beginning of the twentieth century, more changes led to the decline in population at some towns and the establishment of new towns. Navajo encroachment on Hopi land was leading to tensions between the Hopi and Navajo. In the 1930s, the Hopi reservation was effectively limited to 750,000 acres surrounding their villages when grazing districts were created out of the Hopi and Navajo reservations (Clemmer 1979, 1995:167). Settlements in the case have increased the current Hopi reservation to 1.5 million acres; however, the dispute over land and resources rights between the Hopi and Navajo is still underway today.

Hopi economic development after WWII has included oil, gas, and mineral exploration, as well as tourism (Clemmer 1979). Although several factions within the Hopi Tribe have opposed it, strip mining for coal has become the primary income for the tribe. Currently, the Navajo Generating Station is the sole buyer of coal from Black Mesa.

I.4.5 Zuni

In the beginning of the Protohistoric period, pueblos in other areas were abandoned in favor of new settlements in the area of modern Zuni occupation, although the exact timing of when these new pueblos

were founded is still being debated (Kintigh 1985, 2007; Mills 2002). Like the Hopi, the Zuni were primarily agriculturalists, growing maize, beans, squash, and other domesticates. In the sixteenth century, the Zuni's initial contact with Spanish entradas looking for the legendary Seven Cities of Gold was violent and exploitative (Woodbury 1979). Spanish explorers intent on finding riches in the Southwest often embarked on their journeys with insufficient supplies. Upon reaching pueblo settlements in what is today New Mexico, they would demand food and clothing from the pueblos; if these supplies were not forthcoming, there would be violence (Knaut 1995). In the seventeenth century, Spanish attention turned to conversion of the Indians to Christianity, and several missions were established in Zuni towns (Knaut 1995; Woodbury 1979). The presence of the priests in the towns was not universally welcomed; the first mission was built in 1632, but the priest was killed by the Zuni not long after (Woodbury 1979). In the following years, tensions between the Spanish and the Zuni continued to build. Like most of other pueblos in the area, the Zuni participated in the Pueblo Revolt of 1680 (Hackett 1942; Knaut 1995; Woodbury 1979). After the Pueblo Revolt of 1680, many Zunis fled to defensive positions fearing that the Spanish would attack in retaliation. When they returned, they only occupied the town of Zuni and did not return to the five other towns. With a few exceptions, outside contact with the Zuni was minimal until the mid-1800s. Many Zuni began establishing "summer villages" away from Zuni near cultivable lands; Zuni would live in these villages during the summer and would go back to Zuni in the winter (Woodbury 1979). Some efforts were made to re-establish missions at Zuni after the revolt, but these were unsuccessful.

During Mexican control of the Southwest, little contact occurred between the Mexicans and the Zuni (Eggan and Pandey 1979). Like the Hopi, Navajo raids impacted the Zuni during this time. After the United States acquired the Southwest in 1848, contact between the Zuni and Euro-Americans increased with the arrival of travelers moving west in search of gold, settlers moving into the area, missionaries, and anthropologists. In the 1860s, a few towns with Spanish-speaking inhabitants began to appear near Zuni territory, and by 1881 the railroad had opened up access to the area to whites (Eggan and Pandey 1979; Woodbury 1979). Like other groups in the Southwest, smallpox epidemics greatly reduced their numbers in the nineteenth century (Eggan and Pandey 1979). Internal conflicts involving witchcraft accusations at Zuni led the Bureau of Indian Affairs to send in soldiers in the early 1900s (Eggan and Pandey 1979). Traditional ceremonialism remained important to Zuni culture, and efforts to establish Christian churches were met with resistance (Eggan and Pandey 1979; Trotter 1955). A Catholic mission was successfully established in 1922, but its presence split the Zuni into pro- and anti-Catholic groups. This division solidified into political parties over the years; however, few Zuni actually converted to Christianity.

Over time, the Zuni added to their original 1689 Spanish land grant of approximately 17,000 acres; the Zuni reservation today totals about 450,000 acres (Eggan and Pandey 1979; Pueblo of Zuni 2010). In the early 1900s, the Black Rock Dam and new irrigation systems were constructed for Zuni farmers (Pueblo of Zuni 2011). Silver jewelry manufacture became increasingly important after 1925, and by WWII, the sale of jewelry created the majority of Zuni income (Pueblo of Zuni 2011). After WWII, the Zuni expanded their support of silver jewelry manufacture, for which the Zuni are now known (Eggan and Pandey 1979).

I.4.6 Historic Period Euro-Americans

Euro-American knowledge of the region from the Grand Canyon south to the Mogollon Rim and Bill Williams River and from the San Francisco Peaks west to the Colorado River dates to the sixteenth century, when Spanish explorers traveled the area, searching for gold. Subsequently, additional Spanish explorers, American fur trappers, and U.S. military expeditions and surveyors investigated the area. In the late nineteenth century, the region became a major transcontinental transportation corridor and was soon colonized by miners and ranchers.

I.4.7 Spanish Exploration

In 1540, Francisco Vasquez de Coronado went to find the Lost City of Cibola. He did meet the Pueblos in the Rio Grande Valley and was told of a great city northwest of Zuni. Coronado sent Captain Pedro de Tovar to the area that the expedition called the Tusayan Province. Tovar found the Zuni Villages but was disappointed. He was told of a great river to the west and upon his return relayed this information to Coronado. Excited upon hearing this, Coronado sent another of his men, Garcia Lopez de Cardenas, to investigate. He traveled west to the Hopi Mesas, where he found the people to be welcoming. They agreed to supply his men with provisions in order for Cardenas to continue across what is now Kaibab National Forest to the Grand Canyon. Colton (1946) believed that they probably used one of the Hopi trade routes across the Coconino Plateau through the Coconino Basin and along the south side of Red Butte. They probably reached the Grand Canyon at the present location of the Grand Canyon Village. They were unable to descend to the bottom. Other than what must have seemed like endless forests, they did not find or hear of the vast riches they were seeking.

In 1598, Oñate colonized New Mexico and began exploring the Southwest. In 1604, Oñate traveled from the Rio Grande to California by way of the Bill Williams River. Two accounts of the trip have been published, one by Fray Gerónimo de Zárate Salmerón (Bolton 1916:269), the other by Fray Francisco de Escobar (Hammond and Rey 1953:1015).

In summer 1776, Father Francisco Garcés of the Yuma mission journeyed to Hopi. He traveled up the Colorado River to the vicinity of present-day Kingman (Garcés 1900:420 n. 5, 422; Walker and Bufkin 1986:13). Near the vicinity of modern-day Kingman, Garcés crossed the Colorado and headed east to Hackberry and Peach Springs, stopping perhaps at Truxton Spring. After making a detour to Havasupai, he continued on to Hopi. At Oraibi, he was at first ignored, then expelled, and was finally forced to retrace his steps to Yuma.

Later that summer, Fathers Francisco Atanasio Domínguez and Francisco Silvestre Vélez de Escalante, along with eight others, left Santa Fe, New Mexico, to scout a route from Santa Fe to Monterey, California (Vélez de Escalante 1996). Now known as the Domínguez-Escalante Expedition, the priests traveled north of the Grand Canyon in an attempt to find an overland route between Santa Fe and the Spanish colonies on the California coast (Vélez de Escalante 1996). During their time in the Arizona Strip area, they camped in House Rock Valley with the Paiute. Escalante's journals have provided information about the Arizona Strip and the Southern Paiute who inhabited the region at the time.

By the early 1600s, the Spanish empire had begun to exhibit signs of decline, and in the frontier areas under their control, native populations were becoming tired of Spanish hostilities. The culmination of this unrest, the Pueblo Revolt of 1680, resulted in the expulsion of the Spanish from Arizona, New Mexico, and part of Texas for roughly 20 years (Knaut 1995).

I.4.8 Mexican Period

Mexico won its independence from Spain in 1821. The Mexican government however, sponsored few expeditions into western Arizona. Despite Mexico's attempts to discourage incursions into its territories by citizens of the United States, fur trappers continued exploring the Southwest while it was still part of Mexico. Some of these trappers explored the Grand Canyon region. Although most left no records of their explorations, the several trips that have been reconstructed demonstrate the growing Euro-American knowledge of the region, which would be put to use when former trappers like Antoine Leroux guided U.S. military expeditions through the region in the 1850s.

In fall 1826, four groups of trappers traveled to the Gila River. One group, led by Antoine Robidoux, was attacked by Native Americans on the Salt River. Only three survivors, Robidoux, James Ohio Pattie, and an unnamed French trapper, survived. They then joined up with Ewing Young's party (Weber 1971:119–120, 123). The combined Young and Robidoux parties continued down the Gila River to the Colorado River.

In September 1827, Young and Sylvester Pattie led a group of 24 men, “including servants and campkeepers,” to the Gila and Colorado rivers. “They followed the usual route—to the Copper Mines, down the Gila to the Pima Villages” and then to the Colorado River (Camp 1966:43). At the Colorado River, Sylvester Pattie, James Ohio Pattie, and six others “became insubordinate, and parted from the main body” (Camp 1966:45). The rest of Young's group continued along the route followed in 1826, going up the Colorado River to the vicinity of present Lake Mead, returning to the Mohave Villages, traveling overland to the Grand Canyon (at the mouth of Spencer Canyon), then to Grand Falls, Hopi, Zuni, Laguna, and Taos (Camp 1966:53–54; Weber 1971:140–141).

I.4.9 U.S. Exploration and Transportation

Prior to the Mexican War of 1846, very few Americans traveled in northern Arizona. One exception was Jedidiah Smith. In 1826, Jedidiah Smith followed the Old Spanish Trail across the northeast corner of Arizona into what is now southern Nevada. Among other things, he noticed the presence of prehistoric salt mines in the Muddy and Virgin river region. These were to be explored at a later date by Harrington (1926).

Formal military exploration and survey of the Grand Canyon region began after the United States acquired the Southwest from Mexico in the Mexican War. In 1851, Lorenzo Sitgreaves was the first to conduct a survey. He was ordered to see whether the Zuni River provided a feasible route from Fort Defiance and Zuni Pueblo to the Colorado River at Camp Yuma. It was thought that the Zuni River flowed straight into the Colorado River south of the Grand Canyon, but, as Sitgreaves was soon to learn, the Zuni River was a tributary of the Little Colorado River (Wallace 1984:325–326). Guided by Antoine Leroux, Sitgreaves left Zuni on September 24, 1851, and traveled down the Zuni River to its confluence with the Little Colorado east of the South Parcel. The expedition followed the Little Colorado River to Grand Falls and then turned west, traversing the volcanic field north of the San Francisco Peaks. From Bill Williams Mountain, the Sitgreaves Expedition continued west past present-day Ash Fork, Seligman, and Peach Springs, stopping for two days (October 30 and 31, 1851) at Truxton Springs (Camps 27 and 28). Arriving at the Colorado River near present-day Bullhead City, Sitgreaves traveled down the east bank to Camp Yuma (Sitgreaves 1853).

In 1853 and 1854, François Xavier Aubrey, a Santa Fe trader who had gained fame for his rapid transits of the Santa Fe Trail, made trips across northern Arizona. Both times, he drove sheep from New Mexico to California along Cooke's route through southern Arizona and returned to Santa Fe by more northern routes to see whether they would be suitable for wagons or railroads (Bieber 1938).

From 1857 to 1859, Edward Fitzgerald Beale made two round trips across northern Arizona, surveying the route for a wagon road. The Beale expeditions traveled almost the same route as Sitgreaves, skirting the northern headwaters of the tributaries of the Big Sandy River. On the first trip, in 1857, Beale famously brought along camels in order to test their suitability as pack animals for travel in the deserts of the Southwest. Beale repeated his 1857 trip in 1858 and 1859, this time without camels. Along the way, he improved the road he had pioneered in 1857 (Beale 1858, 1860; Stacy 1970; Thompson 1983).

In 1857 and 1858, Lieutenant Joseph Christmas Ives explored the Colorado and Little Colorado rivers. Ives left the mouth of the Colorado on November 28, 1857, took a boat up the Colorado River as far as

Black Canyon (downstream of present-day Lake Mead), and then went overland, descending Diamond Creek into the Grand Canyon. He went southeast, skirting the south side of the San Francisco Peaks (Ives 1861:116).

In May 1863, gold was discovered in the area that would become Prescott. This discovery and the impending Civil War led the Union Army to develop a road from Santa Fe to central Arizona. In June 1863, Captain Nathaniel J. Pishon was to escort surveyor John A. Clark through northern Arizona.

They were to develop a road from the Beal Wagon Road to the gold fields to the south. The route selected was through the southern Kaibab National Forest between present-day Flagstaff and Prescott. The route connected Ft. Wingate in the New Mexico Territory to Ft. Whipple in Arizona.

In 1867 and 1868, William Jackson Palmer conducted surveys along the 32nd and 35th parallels to evaluate these routes for the Kansas Pacific Railway from Sheridan, Kansas, to the Pacific Ocean at either San Diego or San Francisco (Palmer 1869).

In 1862, Mormon explorer, missionary, and pioneer Jacob Hamblin explored the area (Bailey 1948; Simonis 1998, 2001). Crossing the Colorado River at modern-day Pearce Ferry, Hamblin traveled south, apparently to Tanyika Ha'a in Grapevine Canyon, at what is now the Grand Canyon West Ranch. Hamblin wrote, "The first day [after crossing the Colorado] we traveled south up a wash [Grapevine] for about 30 miles. We then traveled three days through a rough, bushy country" (Bailey 1948:251).

In the years after the Civil War, the federal government launched a concerted effort to survey the American West through four government expeditions, led, respectively, by John Wesley Powell, Ferdinand V. Hayden, Clarence King, and George M. Wheeler (Bartlett 1962). Dubbed the era of the "Great Surveys of the West," beginning in 1867, John Wesley Powell led a series of expeditions into the Rocky Mountains and around the Green and Colorado rivers. In 1869, he and his party set out to explore the Colorado River and the Grand Canyon (Bartlett 1962). Powell retraced the route in 1871–1872 with another expedition, producing photographs (by John K. Hillers), an accurate map, and various papers. In 1875, Powell published a book based on his explorations of the Colorado River that was originally titled *Report of the Exploration of the Colorado River of the West and Its Tributaries*; the book was revised and reissued in 1895 as *The Exploration of the Colorado River and Its Canyons* (Powell 1967 [1895]).

The Wheeler Expedition explored the region in 1871 and apparently stopped at Tanyika Ha'a in Grapevine Canyon (Simonis 2001; Wheeler 1872:86). The Wheeler map shows a trail running south from what is now Pearce Ferry into what is now called Grapevine Canyon to "Tin-nah-kuh" Spring and then back out into the Hualapai Valley. These surveying expeditions were ultimately replaced, in 1879, by the USGS (Bartlett 1962).

Other military and civilian geographical and exploratory surveys provided information on the region and its inhabitants during the mid-1800s (Ives 1861; Simpson 1876; Wheeler 1872, 1875, 1889; Whipple 1856). Two others reported on American Indian groups in the surrounding areas, including southern Nevada and the adjacent Colorado River: Hoffman (1878) and Whipple (1856). These reports documented the Chemehuevi and the Southern Paiute bands living in the Las Vegas area at Las Vegas Springs, Muddy River, and Ash Creek in southern Nevada and along the Santa Clara and Virgin rivers in southern Utah. These studies are important because they provide the means for comparative study with the Historic period Paiute in the proposed withdrawal area.

In 1874, the Historic Temple Trail was built between Mt. Trumbull and St. George and cuts through House Rock Valley to haul lumber. Portions of this road later became known as the Honeymoon Trail

because it was reported to have been used by young couples on their way to St. George to be married in the Temple and to return home.

Beginning in the mid-nineteenth century, livestock were herded from New Mexico into what is now the Kaibab National Forest. More than 551,000 sheep crossed this area on the way to California. The herders, traveling west, returned later to settle in these forests, and the West's cattle industry boomed by the 1870s. Money was to be made feeding miners, and many ranchers established ranches here. By the 1880s, permanent ranches were springing up.

The transition from the trails shown on Wheeler's map to the roads shown on Powell's map was part of a generally improving transportation network in the 1870s and 1880s. Sometime after 1875, Harrison Pearce established Pearce Ferry (Simonis 1998, 2001). Completion of the A&PRR's transcontinental route through northern Arizona in 1883, combined with various federal settlement and reclamation programs, accelerated the economic growth and development of the Grand Canyon region.

The A&PRR's construction of a line across Arizona might not have occurred if other railroads had not interceded with partnerships and funding (Janus Associates Inc. 1989). The A&PRR had been chartered in 1866 by Congress to build a line from Spring Field Missouri to the Colorado River and then to San Diego. The route was to generally follow the 35th parallel across Arizona. Unfortunately, the A&PRR went bankrupt in 1876 after completing only 361 miles of track from St. Louis westward, falling far short of the Arizona–New Mexico section. The company came into possession of the St. Louis and San Francisco Railroad (SL&SFRR), which itself was suffering from money troubles. In November 1879, the SL&SFRR, A&PRR, and Atchison, Topeka & Santa Fe Railroad (AT&SFRR) teamed up to complete the line to the West Coast. The AT&SFRR had the funds, and the A&PRR held the deed to the right-of-way west of Albuquerque.

As soon as the agreement was signed by the three companies, the AT&SFRR began to prepare for construction. A route was selected along the Rio Puerco to Holbrook to Kingman in part because of the earlier Whipple surveys, which were used as a guide and by the Union Pacific Railroad surveys across the area. Starting in Isleta, New Mexico, construction began in summer 1880. Contracts had already been signed between local companies along the route to clear, grade, and supply ties. Camps were established, and workers were hired to complete the line. Lewis Kingman ran the project by first leading the survey crews and then the construction itself. The track was finished to Holbrook in July 1881, but flooding prevented the first train to run until mid-September of that year. The tracks were completed to Winslow in December 1881. By August 1882, track layers had reached Volunteer, now called Bellemont, and the track reached Williams in September. Because of several tunnels and bridges west of Williams, the line did not reach Needles until August 1884, where it joined with the Southern Pacific Railroad. Although they were not major hubs like Winslow or Needles, Flagstaff and Williams did offer support services for the railroad, with structures at each stop.

Unfortunately, the line did not have the traffic that had been projected. Maintenance was deferred, leaving some of the wooden bridges to deteriorate and the bed itself to become eroded. In the mid-1890s, Edward P. Ripley bought the railroad and immediately began to refurbish it. He replaced cars, track, and all the wooden bridges with steel, including the 1,100-foot bridge across the Colorado River at Needles.

Fred Harvey was associated with the AT&SFRR as early as 1876, when he opened a lunch counter in Topeka. With success with this venture, he soon opened several restaurants and hotels along the line. Restaurants opened in Holbrook, Winslow, Williams, Ash Fork, Seligman, and Kingman. Next were resort hotels; the one in Williams was called the Fray Marcos. At the Grand Canyon, the El Tovar and the Bright Angel Lodge were constructed.

Prior to World War I (WWI), there were few roads providing access to the forests, and most of these were leftover, badly eroded trails that had been logging roads. By 1901, officials of the forests had concluded that they needed better access for management of the forests and protection from fire. The first federal funding for roads here was in 1910. Between 1910 and 1920, with the increase in automobiles, roads were being constructed across the region. By 1926, the volume of automobile traffic and their passengers surpassed what the trains brought to the Grand Canyon. The Federal Aid Road Act of 1916 provided matching funds to construct roads. The Old Trails Highway was built by the state this way; it followed the approximate path of the Beal Wagon Road. In 1926, the road was designated U.S. 66 (Route 66). Route 66 between Chicago and Los Angeles was paved by 1938. This 2,282-mile-long route was the nation's first completely paved transcontinental highway (Putt 1991).

In 1919, a road between Williams and the Verde Valley was proposed. Funding for this road was continually diverted for improvements to Route 66, however. A paved road between the Grand Canyon and Williams was proposed in 1925. This would replace the existing trail to the Bright Angel area. Unfortunately, it was not until the problem with ownership of that location was resolved that construction of the road began. It was begun in 1928 and was completed on Christmas Eve in 1930.

In May 1930, Congress passed the Colton-Oddie Bill, authorizing \$3.5 million in funding for forest road and trail development. In April 1931, the U.S. Department of Agriculture announced that they had \$560,000 for forest highways. With the onset of the Great Depression and the CCC, road building began in earnest.

Air flight began with the permitting of Scenic Airways to establish a landing field near Red Butte. The Grand Canyon Airport was used until the 1960s, when a new airport used today was built south of the village of Tusayan. The Grand Canyon Historic Airport District was listed in the NRHP in 2007.

I.4.10 The Forest Reserves and the Forest Service

In 1873, Congress passed the Timber Culture Act, and in 1880, they passed the Timber Cutting Act. These acts promoted the removal of timber from public lands for domestic and mining uses. After 1890, however, when John W. Powell's report to Congress on the state of the forests was issued, foresters and researchers pushed for action to fix the problem these acts had created. Powell revealed that the forests were in a serious state of decline and posed a serious environmental and economic threat to the country. In response, the Congress passed the Forest Reserve Act of 1891, which gave the authority for the President of the United States to set aside forests in order to manage their natural resources. This was the beginning of the forest reserves, and in 1893, President Benjamin Harrison passed a proclamation establishing the Grand Canyon Forest Reserve (Putt 1991).

In 1898, President William McKinley set aside more lands in northern Arizona as the San Francisco Mountain Forest Reserve. The forest reserves were transferred from the U.S. Department of the Interior to the Forest Service. In 1908, the area above the Colorado River became the Kaibab National Forest; the Tusayan National Forest, headquartered in Williams, was established in 1910. Grand Canyon National Park was created in 1919, which substantially reduced the size of the forest. In 1934, the Tusayan and Kaibab national forests were combined to create the present-day Kaibab National Forest.

I.4.11 Grand Canyon National Park

The establishment and evolution of Grand Canyon National Park began with the increasing interest with tourism in the late nineteenth century. The administrative history of the Park is detailed in Anderson (2000); a short synopsis is presented here.

In the late 1880s, the Grand Canyon attracted miners, ranchers, and entrepreneurs seeking to make their way in the West by obtaining lands from the federal government. Prior to the 1880s, wagon roads were the only real access to the areas, making settlement sporadic; however, the completion of the A&PRR, which was owned by the AT&SFRR, to the area in 1882 made travel to and from the Grand Canyon area easier and ushered in a new business in the West—tourism (Anderson 2000:2–3). Several new towns were settled along the rail line, which attracted new businesses to the area. Mining became more profitable as the railroad decreased shipping charges, ranching became big business, and lumber companies set up to supply wood for railroad facilities and other buildings and structures (Anderson 2000:3). Some of these early pioneers, such as William Wallace Bass, also set up tourism businesses, guiding people on excursions to and down into the Canyon. One group who later created problems consisted of Pete Berry and Niles and Ralph Cameron; they had control of the Bright Angel Trail from the rim to Indian Gardens, which they ran as a toll road. James Thurber built the Bright Angel Hotel at the head of the trail on the rim in 1896, and in 1901 a rail line from Williams to the Bright Angel Trail, Grand Canyon Railway, was completed, allowing even more tourists to journey to the Canyon (Anderson 2000:4–5).

The stage was set for the creation of the Grand Canyon National Monument and later the national park beginning in the 1890s in Washington, D.C. As noted above, Congress passed the Forest Reserve Act in 1891, which allowed federal forest lands to be set aside by the president. This allowed President Harrison to set aside the Grand Canyon Forest Reserve in 1893, portions of which were later declared a game preserve by President Theodore Roosevelt (Anderson 2000:7). In 1906, Congress passed the American Antiquities Act, which allowed presidents to declare places national monuments in order to preserve their historic or scientific value. President Roosevelt declared 1,279 square miles of the Grand Canyon the Grand Canyon National Monument in 1908 (Anderson 2000:7–8). The Grand Canyon Forest Reserve was renamed the Grand Canyon National Forest and taken over by the Forest Service in 1907; the monument was added to the Forest Service's care the next year. At this time, the Forest Service had very little in the way of amenities for visitors to the Grand Canyon; most facilities were owned and operated by the AT&SFRR, the Fred Harvey Company, and a few smaller independent operators (Anderson 2000:9–10).

In 1916, Congress created the NPS; in 1919, the Grand Canyon was transferred to the NPS and designated a national park. The NPS, along with its first director Stephen Mather, was very interested in promoting tourism to its parks. It promoted development of new roads to the parks to accommodate tourists and launched a See America First ad campaign to urge Americans to visit their own wonders rather than travel to Europe. In 1919, William Harrison Peters became the Grand Canyon National Park's first superintendent and began the task of upgrading what facilities the NPS could; however, most facilities will still provided by the outside sources noted above (Anderson 2000:13–14). Even with the many vendors competing for tourist business, visitors to the Grand Canyon suffered from shortages of housing options and unsanitary conditions. The Park did provide rangers to enforce laws and regulations and utilities such as new phone lines. Peters also had several new buildings constructed, such as a warehouse and a mess hall for employees (Anderson 2000:17). Peters' successors continued to construct other facilities to house and feed the growing workforce at the Park. The Park's first master plan was completed in 1924; the plan focused on development at the Grand Canyon Village, and although many of the ideas in the plan could not be constructed right away, the plan continued to guide development at the Park into the 1950s (Anderson 2000:18). Other developments within the Park included the construction of new trails, roads, and campgrounds to accommodate the growing number of tourists arriving by automobile in the 1920s and 1930s. The new trails included the South Kaibab Trail, which was completed in the 1920s and was designed to bypass the Bright Angel Trail (Anderson 2000:20–23).

In the 1930s during the Great Depression, the Park benefited from New Deal programs such as the Public Works Administration and the CCC (see above). The CCC began arriving in 1933 and began maintenance, construction, and conservation programs throughout the Park (Anderson 2000:26). Vendors in the Park suffered as a result of the downturn in tourism during the depression; some projects did move

forward, like the Utah Parks Company water system on the North Rim and the AT&SFRR's new water system from Indian Gardens to the Grand Canyon Village (Anderson 2000:27–28). Along with new infrastructure, educational programs began to rise in importance in the Park; for example, the Park began to develop more lectures and exhibits and to train more rangers in educating the public. Residents of the Grand Canyon Village also became more interested in education and in 1932 began the Grand Canyon Natural History Association, which later became the Grand Canyon Association (Anderson 2000:34). Other important developments in the 1930s included the addition of several square miles to the Park itself and the creation of the Grand Canyon National Monument in 1932 (Anderson 2000:38).

Like the rest of the country, during WWII the NPS and the Grand Canyon National Park did their part to assist with the war effort, although Grand Canyon National Park was not as heavily used by the military as other parks. The Army used the recently abandoned CCC camps to house troops coming to the Park for recreation but not for training (Anderson 2000:42). Government austerity measures cut down on the number of Park staff during the war, putting strain on some facilities, and overall visitor numbers were down (Anderson 2000:42). Starting in 1945, after the war was over, visitation to the Grand Canyon National Park once again picked up, and by 1948 more than 600,000 people visited the Park each year (Anderson 2000:44). The influx of visitors prompted more infrastructure development, including a new electric transmission line built by Arizona Public Service (Anderson 2000:49). Starting in the 1950s, the demand for services at national parks prompted the NPS to institute a massive building program called Mission 66, which would continue until the 1980s (Anderson 2000:57).

At Grand Canyon National Park, a new Mission 66 prospectus was developed that became the Park's Master Plan into the 1970s. New facilities such as the Grand Canyon Visitor Center, new campgrounds, and new sewer and water lines were built either by the NPS or through contracts with local companies (Anderson 2000:58–59). Over the next few years, the Park kept up facility development mainly on the South Rim; facilities on the North Rim were primarily the responsibility of the Utah Parks Company until they donated all North Rim facilities to the Park in 1972 (Anderson 2000:61). The Park boundaries continued to be defined and expanded, culminating the addition of the Grand Canyon National Monument and the Marble Canyon National Monument to Grand Canyon National Park in 1972 (Anderson 2000:67).

I.4.12 Timber and the Forests

Since the 1880s, the timber industry has been a primary industry in forested areas south of the Grand Canyon within the proposed withdrawal area. Logging and the necessary supporting infrastructure, such as rail lines, water works, and power-generating plants, sustained more than half of the workforce in both Flagstaff and Williams during the first part of the twentieth century (Stein 2006:5).

At first, lumber companies used horse and wagon to haul logs to the mill. As the timber was depleted, the mill was moved to the next location (Plummer 1904:14). Initially, the only market for lumber in the region was for mining. It was not until the railroads began building in earnest that the need for lumber for ties became paramount. In addition, once the rail lines were in, shipping lumber to other markets became feasible.

In 1880, construction began on the A&PRR, a subsidiary of the AT&SFRR. The A&PRR stretched across northern Arizona, passing through Flagstaff and Williams on its way from Albuquerque to Needles. Construction of the railroad to Flagstaff was completed in 1882. The A&PRR created a demand for ties, as many as 3,400 per mile, that was met in part by local lumber companies along the route. A secondary supporting market blossomed, supplying rails and other hardware, locomotives specific to moving logs over short distances, lumber equipment, and all the supplies necessary to keep logging crews fed and clothed. The A&PRR through Flagstaff became the AT&SFRR in 1902 (Hardy 2010).

Timbering first started south of the Grand Canyon in the 1880s to supply the mines near what would become Prescott after timber resources in the Prescott area had been depleted. While many of the logging companies in the Prescott area went out of business with the depletion of timber resources, W. Z. Wilson and Alvin Haskell moved their operation from Prescott to the forests surrounding Williams and Chalender and opened a mill near present-day Dogtown Reservoir. In 1881, Chicago industrialist Edward Everett Ayer received timber rights along the A&PRR right-of-way and established the Ayer Lumber Company, which was awarded a contract to supply railroad ties and other lumber to the A&PRR and to supply ties and telegraph poles to the Mexican Central Railroad. Ayer opened a sawmill in Flagstaff two weeks before the A&PRR reached town and subcontracted with other mill operators such as Wilson and Haskell to meet demand (Stein 2006).

By the late 1880s, the transcontinental AT&SFRR and its subsidiaries had created an enormous market for lumber locally and nationally. In addition, manufacturers had developed locomotives and other devices suited for lumbering. The so-called “timber barons”—individual landowners who had purchased land with timber rights prior to the construction of the railroad—were free to clear-cut the land on which they held timber rights; logging companies purchased their timber rights from the transcontinental railroads, which had been granted alternate “checkerboard” sections of land from the federal government (Stein 2006).

In 1886, Ayer sold his company to his manager, D. M. Riordan, who formed the Arizona Lumber Company. Riordan and his associate Francis Hinckley acquired the Arizona Mineral Belt Railroad in 1888; the railroad had been completed between Flagstaff and Mormon Lake in 1887. Soon after, the Mineral Belt was renamed the Central Arizona Railway, and a network of spurs was constructed off the main line to harvest timber south of present-day Lake Mary. The company reorganized in 1890 as the Arizona Lumber and Timber Company. The Arizona Lumber and Timber Company built and operated numerous mainlines and spurs under the name Central Arizona Railway from 1889 to 1937, reaching to Clark Valley, Rogers Lake South, Greenlaw North, Greenlaw South, Rogers Lake North, Woody Ridge, and Munds Park-Howard Spring (Stein 2006).

In 1893, the Saginaw Lumber Company purchased timber rights to thousands of acres of former A&PRR land and constructed mills in Williams and Chalender. The company became the Saginaw and Manistee Lumber Company after a merger in 1899. From 1898 to the 1940s, the Saginaw and Manistee Lumber Company built and operated railroads to access timber south of Williams, north of Chalender, north of Belmont, south of Garland Prairie, south of the Grand Canyon, and south of Mormon Lake (Stein 2006).

The Flagstaff Lumber Manufacturing Company (Flagstaff Lumber Company) was established in 1909 by Ed McGonigle, who had been the general superintendant of Arizona Lumber and Timber Company’s Flagstaff Mill. In 1910, the company completed construction of the Flagstaff & Southern Railroad from Flagstaff to Clark Valley. Other lines were constructed to reach timber stands at Howard Mountain, Anderson Mesa, and Mormon Mountain between 1910 and 1927, when the company was purchased by the Arizona Lumber and Timber Company. Loggers were housed in logging camps close to the areas being cut. Camps were usually portable and were moved to a new area once an area was depleted. The camps served as fueling and repair centers for workers, locomotives, and horses. In addition to loggers and railroad mechanics, blacksmiths were housed at the camps to keep the horses properly shod and to repair logging machinery. As the camps were temporary, most are evidenced today by food-related trash scatters resulting from the enormous quantities of food consumed by hard-laboring logging crews (Stein 2006).

During WWI, the government nationalized railroads and instituted price controls on railroad ties and other lumber. In addition to wartime restrictions, forest management plans were written and implemented in the 1920s. As a result of a 1923 plan, based on an earlier 1910 plan, timber harvesting guidelines were

finally put in place. Under these requirements, the forest was divided into blocks, and logging units and restrictions were applied. Forest replenishment (replanting) was considered for the first time. Sheep were to be limited, and an increase in fire protection was instituted in order to allow the seedlings to grow. By 1927, the Saginaw and Manistee Lumber Company had logged their own lands to the point that the only trees available to them were on federal lands. In 1938, the Forest Service began to limit timber harvesting to improve forest health. In 1941, the Arizona Lumber and Timber Company ceased its timber operations and leased its entire works to the Saginaw and Manistee Lumber Company, which supplied ties to the Prescott & Phoenix Railroad (Stein 2006).

Timbering north of the Grand Canyon began in the late 1800s. The earliest sawmill on the Kaibab Plateau was set up at Levi Stewart's ranch at Big Springs in 1871 and later moved to Castle Springs; but by 1878, the site had been abandoned (Altschul and Fairley 1989). A second mill was constructed at Jacob's Lake in the late 1870s or early 1880s and was the only mill operating within the Forest Service boundaries in 1910 (Lang and Stewart 1910). The Jacob's Lake mill burned in 1911 or 1912, and a new mill was built in LeFevre Canyon (Altschul and Fairley 1989). These early operations were steam driven, with crews of six to eight men. A crew would log in the spring until enough logs were stockpiled, and then that same crew would work the sawmill. When the timber was depleted, the entire operation was moved to a new location (Altschul and Fairley 1989).

The area that is now the North Kaibab Ranger District was originally withdrawn from the public domain in 1893 as part of the Grand Canyon Forest Reserve and transferred to the Forest Service in 1907 (Anderson 2000). The Forest Service conducted an inventory of the timber resources on the Kaibab Plateau in spring 1910 and determined that there were approximately 1,362,130 board feet of marketable lumber in the forest. However, the lack of adequate transportation, primarily a railroad, rendered large-scale timbering infeasible (Lang and Stewart 1910). The Utah Southern Company expressed an interest in constructing a railroad from Utah to the North Rim of the Grand Canyon in the early 1900s, but the plans fell through (Altschul and Fairley 1989).

Logging in the North Kaibab Ranger District remained a small, localized enterprise until the 1940s, when the WWII war effort and post-war economic boom created an increased demand for lumber. By 1945, the Whiting Brothers company from St. Johns, Arizona, operated a sawmill at Jacob's Lake and in House Rock Valley and eventually added a planing mill. In the early 1950s, the Forest Service increased the annual timber harvest in the North Kaibab Ranger District to 25,000,000 board feet and bid out a 25-year contract, which was known as the Big Saddle Timber Sale. The winning contractor was required to have enough capital to construct a complete single band sawmill with a daily capacity of 20,000 board feet, a fleet of logging trucks and tractors, and the means for installing logging camps and roads in the vicinity of the Big Spring Ranger Station. The Whiting Brothers won the contract, ensuring the company a monopoly on the Kaibab Plateau for 25 years (Altschul and Fairley 1989). Presently, logging is used as a forest management tool within the North Kaibab Ranger District.

1.4.13 Ranching and Grazing

Ranching in the West can be divided into two general periods (Sayre 1999). These periods are 1) open-range grazing; and 2) government regulated and fenced ranching. The open-range grazing period had become well established in Arizona by the late 1870s after the introduction of cattle on the range and continued until the Taylor Grazing Act of 1934. Cattle ranchers could obtain land through the 1862 Homestead Act, which provided 160-acre parcels; the Timber and Culture Act of 1873, which increased the amount of land if the owner planted 40 acres of trees over time; and the Desert Land Act of 1877, which expanded the acreage to 640 because of the lack of water in the West. The land had to be irrigated, and a small per-acre fee was assessed.

Along with these homesteading acts, land was claimed simply by its use. Livestock grazing in the region has evolved and changed considerably since it began in the 1860s. At the turn of the century, large herds of livestock grazed on unreserved public domain in uncontrolled open range. Eventually, the range was stocked beyond its capacity, causing changes in plant, soil, and water relationships. Protective vegetative cover was reduced, and more runoff brought erosion, rills, and gullies.

In response to these problems, livestock grazing reform began with the passage of the Taylor Grazing Act in 1934. This legislation was intended to prevent overgrazing and soil deterioration; to provide for the orderly use of the public lands; and to stabilize the livestock industry, which depended on the public range.

Before the passage of the Taylor Grazing Act, many different interests had pushed for either local or national control. Many in the federal government supported national control over these lands, viewing them as a public asset. This position was strengthened with passage of the Emergency Conservation Work Act, also in 1934, because administrators of this federal work program did not want to invest time, money, and manpower into lands not under federal control (Paige 1985; Seymour 1995).

Because it changed the way the government managed federal land, the Taylor Grazing Act of 1934 was probably the most significant federal legislation the West has seen to date. For one, it essentially ended the Homestead Act, and for the first time, the federal government asserted authority over the “public domain.” In the years leading up to this legislation, state and federal interests debated how to use and control western lands. This legislation ended that debate. One result of this legislation was that livestock associations were encouraged to organize and seek local oversight.

Ranching and Grazing on the Arizona Strip

Euro-American exploration of the Arizona Strip began in earnest with Mormon missionary expeditions in 1858–1859, which were led by Paiute guides. Missionary Jacob Hamblin remained with the Paiute through the 1860s (Spangler 2007). Hamblin and other settlers began staking claims to springs and establishing ranches in the western portion of the Arizona Strip and in the present North Kaibab Ranger District in the early 1860s. In 1871, at the urging of Hamblin, John D. Lee established a ranch and ferry crossing in Marble Canyon. The ranch became known as the Lonely Dell and the ferry as Lee’s Ferry. The ferry was operated by Lee’s wife Emma until 1874. She was followed by Warren Johnson, who purchased the ferry and operated it until 1894. The ferry was the only means of transporting cattle and Mormon settlers to the North Rim and the Kaibab Plateau (Altschul and Fairley 1989; Spangler 2007).

John D. Lee established ranches at House Rock Springs and Jacob’s Pools, named for Jacob Hamblin, in the House Rock Valley in 1872. Mormon settlement continued to grow throughout the 1870s, and in 1874 the Church of Latter-Day Saints (LDS Church) began to experiment with communalism. The United Order of Orderville (OUO) was the most successful of the communalism ventures, established in an effort to overcome the economic impact of the Panic of 1873. All possessions of the OUO were held in common among participating members, with the exception of houses and house lots. Labor was organized for the good of the community, and products were shared equally (Altschul and Fairley 1989). By 1878, the OUO had acquired the water rights to House Rock, Kane, Castle, and Elk Springs and Jacob’s Pools for watering cattle and sheep. Another large-scale venture, known as VT, was operating simultaneously out of Big Springs Ranch in what is now the North Kaibab Ranger District. OUO cattle and sheep grazed the northern lands of the Arizona Strip, and VT livestock grazed the southern lands of House Rock Valley and the Kaibab Plateau (Altschul and Fairley 1989; Spangler 2007).

In 1887–1888, the OUO and VT cattle companies dissolved, with livestock holdings distributed to shareholders. John W. Young, son of Brigham Young, formed the Kaibab Cattle Company with his share of both companies and obtained the rights to House Rock Valley and DeMotte Park (VT Ranch) on the

North Kaibab Ranger District. The Canaan Cattle Company also operated out of House Rock Ranch as a quasi-private enterprise made up of other shareholders of the defunct OOU and VT companies (Altschul and Fairley 1989).

In the late 1800s, while on a mission in England, John W. Young convinced “Buffalo” Bill Cody to act as a tour guide for a handful of English aristocrats at Young’s ranch. The group arrived in 1891 and stayed at Kane Ranch while touring the Kaibab Plateau and the North Rim of the Grand Canyon. The aristocrats deemed the area too remote and inaccessible to be profitable, and the failure of the venture encouraged Young to relinquish his ownership claims on the Kaibab Plateau to the government for the establishment of the Grand Canyon Forest Reserve in 1893 (Spangler 2007).

In 1895, the Canaan Cattle Company and House Rock Ranch were sold to Benjamin F. Saunders, a prominent rancher on the west side of the Arizona Strip. In 1899, Saunders obtained the Kane Ranch and became known as “the Bar Z Outfit.” Disputes with neighboring ranchers such as James Emmett led to the construction of a drift fence along the eastern edge of Saunders’ properties in 1906; overgrazing of areas west of House Rock Valley by Saunders’ cattle prompted the Forest Service to construct a drift fence along the western edge of his properties in 1909. In 1907, the Grand Canyon Cattle Company purchased Saunders’ holdings, and in 1909, they purchased Lee’s Ferry from the LDS Church in an effort to thwart James Emmett and secure access to Flagstaff for the sale and transportation of livestock (Altschul and Fairley 1989; Spangler 2007). The ferry was then sold to Coconino County the following year (Altschul and Fairley 1989). The company operated large-scale cattle ranching on the Arizona Strip until at least 1924 and hosted Theodore Roosevelt and his sons at House Rock Ranch during a mountain lion hunt on the North Rim of the Grand Canyon in 1913 (Spangler 2007).

Henry S. Stephenson and Genaro Fourzan purchased the Grand Canyon Cattle Company in 1930. By 1933, Fourzan was no longer listed as a partner, which left Stephenson as the largest landowner in the eastern Arizona Strip, with water rights to the whole of House Rock Valley (Spangler 2007). The Taylor Grazing Act of 1934 dealt a harsh blow to large-scale ranching, and in 1939, as the result of a divorce settlement, Stephenson began selling off his properties to neighboring ranchers. The last of his holdings, including all rights to House Rock Valley, were sold in 1945 to Royal Woolley (Spangler 2007).

The Grand Canyon Trust and the Conservation Fund purchased Kane Ranch and Two-Mile Ranch in House Rock Valley in 2005 with the intention of rehabilitating the ecosystem from years of overgrazing and developing conservation-based, sustainable land management practices (Grand Canyon Trust 2009).

Grazing in Arizona’s Forests

According to Putt (1991), grazing was the Kaibab National Forest’s first industry. Cattlemen began to bring livestock into the area in the 1850s and 1860s to support the early military excursions into the region. Beale’s Wagon Road was used by sheep herders to push herds from New Mexico to California at this time. Once the Civil War began, livestock was also herded to military bases in California, Arizona, and New Mexico.

Because of poor range conditions and overcrowding in California in the 1870s, many ranchers brought their herds east. Unlike in California, homesteaders had not created fences in Arizona, and open range was available to graze on. On the Kaibab National Forest, the first permanent ranches were established around the Bill Williams Mountain area in 1876, but it was construction of the railroad in 1882–1883 that increased settlement of the area. The area was particularly suited to sheep, and by 1884 many herds had been moved there. It did not take long before there were more livestock than there was forage for them. By 1890, conflict had developed with Euro-American ranchers, who were using Havasupai and Hualapai traditional lands.

Drought and overgrazing had caused the condition of the forest to deteriorate, and ranchers knew that something had to be done. In 1898, the San Francisco Forest Reserve was established. At that time, the reserve consisted of even-numbered sections, with the odd-numbered ones being private lands. Almost immediately, the federal government realized that managing these 1,500 sections of 1 square mile of forest would be almost impossible. Federal law allowed cattle grazing but not sheep grazing. Therefore, the government embarked on an ambitious plan to trade out the private lands into federal control. Property owners would have the opportunity of having equal lands elsewhere. The largest landowners were the AT&SFRR, the Perrin and Baker families, the Aztec Land and Cattle Company, and the Saginaw and Manistee Lumber Company.

A study of range conditions conducted by Gifford Pinchot in 1900 resulted in the finding that livestock grazing, including sheep, was compatible with forest management goals. Pinchot did, however, recommend that the Forest Service restrict the size of the herds. The government instituted several measures, such as increased grazing fees and fencing, but they were not strictly enforced. Permits were becoming harder to get, especially as officials cut the number of livestock permitted to graze on the forest. As WWI began, the increased need for meat caused prices to escalate, resulting in more permit applications' being submitted.

Into 1925, the range continued to suffer. Permit costs continued to rise as numbers of livestock allowed were dropping. Fees were to be tripled from those instituted in 1906. Fencing was to be required. Because of the demand for livestock and the poor economy, these measures were not enforced. The only change was the reduction in livestock numbers. With this one change, however, only the largest cattle operation had survived into the 1920s. Ten years later, with the enactment of the Taylor Grazing Act, federal lands administered by the Department of the Interior were subject to even greater control over grazing practices to improve the condition of the rangelands.

Basque sheepherders experiencing crowded ranges and increased expenses in California took advantage of the open spaces in the Great Basin and interior Arizona that had been approved for sheep grazing. Basque immigration, with the express intent of sheepherding, was highest from 1900–1930 (Egurrola 1998). Basque sheepherders had a unique tradition of carving dendroglyphs on aspen trees throughout their grazing areas, many of which are present in the Kaibab National Forest. The glyphs consisted of names, dates, pictures and symbols, and occasionally poetry (Mallea-Olaetxe 1992). While many of the carvings were simply the doodles of lonely sheepherders, others served specific purposes. Carving one's name in a tree was a way of staking a grazing claim, and symbols and messages served as a way to communicate with other sheepherders in the region. One such glyph in Nevada commemorated the meeting of two herders from separate Basque villages who met in the forest to celebrate the running of the bulls in Pamplona (Mallea-Olaetxe 1992). The carvings of specific sheepherders are so prolific that their migrations can be traced from season to season and year to year. Timbering in the forest, combined with the relatively short lifespan of aspen trees, has led to increased efforts in the recording of dendroglyphs within national forests (Mallea-Olaetxe 1992).

I.4.14 Homesteading and Farming

The 1862 Homestead Act allowed the head of a family to file on a parcel of 160 acres after living on it for five years. The land had to be surveyed first. Many settlers moved onto public lands, built a house, and plowed a field. They could then file a claim for the land. With enactment of the Creation Act in 1891, people who had not filed could no longer do so, and some lost their property. In 1902, the government gave these settlers a final chance to fill out the papers. The deadline for the act, which gave “relief for bona fide settlers on forest lands,” was two years.

The 1862 Homestead Act and the Forest Homestead Act of 1906 encouraged homesteading in the West. However, forest lands in the project area were withdrawn from the public domain in 1893 with the creation of the Grand Canyon Forest Reserve and as such could not be homesteaded.

Homesteading on the Arizona Strip was limited by the scarce water resources, which were mainly controlled by ranchers beginning in the 1870s (see above). The majority of homesteading claims in the Arizona Strip were created by Mormon families in a string of farmsteads along the base of the Vermilion Cliffs and the western flank of the Kaibab Plateau. The earliest farming communities on the Arizona Strip were Beaver Dams (1870s), Fredonia (1885), and Short Creek (Colorado City, ca. 1909) (Altschul and Fairley 1989).

The Dry Farming Act of 1909 encouraged homesteading claims further south into the strip, allowing homestead claims of 320 acres in areas potentially suitable for farming without irrigation. By the 1920s, homesteading communities in the western strip included Tuweep east of Mt. Trumbull, Little Tank in the Main Street Valley, Wolf Hole, and Bundyville west of the Hurricane Cliffs. In 1913, homesteaders began staking claims in the rangelands surrounding the Bar Z Canebeds Ranch and the southern portion of House Rock Valley. Increased competition for range lands and Forest Service grazing fees eventually led the Grand Canyon Cattle Company (Bar Z) to leave House Rock Valley (Altschul and Fairley 1989).

Beginning in 1927, there were several years of drought, which, coupled with the drop in prices during the Great Depression, caused many farmers to lose their land because they could not pay their taxes. Homesteads that were sold were bought by local ranchers, although subsistence farming was still popular because it fed families. With the passing of the Taylor Grazing Act of 1934, all vacant, unreserved, and inappropriate public lands were withdrawn from settlement. This was the end of new homesteads and slowly became the end of much of the farming in the region.

I.4.15 Mining

As early as 1650, the Spanish may have mined silver near Red Butte (Putt 1991). More widespread prospecting did not begin, however, until the 1860s, when Sam Ball of the Miller Party hunted north of Bill Williams Mountain. Discoveries of copper on the North Rim motivated miners to prospect on the South Rim, as well. Small discoveries in the 1880s of copper ore were made by the Cameron brothers, Ralph and Niles, and their partner, Pete Berry. These three filed numerous claims around the Grand Canyon (Billingsley et al. 1997).

Starting in 1866 with Revised Statutes 2318 (better known as the Lode Law of 1866), “the mineral lands of the public domain, both surveyed and unsurveyed, were opened to the free and open exploration and occupation by all US citizens of the United States.” A similar second law, the Placer Act of 1870, was then passed by Congress. Then in 1872, President Ulysses S. Grant signed a mining law intended to promote the settlement of publicly owned lands in the West. This third mining law combined the Lode Law of 1866 and the Placer Act of 1870 and promoted development by allowing mining interests to take valuable hardrock minerals, including gold, silver, and uranium, from public lands.

During Powell’s expedition in 1872 (see above), two of his packers discovered gold in the sand at the mouth of Kanab Creek. A rush of miners flooded the area, only to discover that the gold was too fine to be exploited profitably (Billingsley et al. 1997). Copper, however, was abundant and lucrative.

The Bentley Mining District was formed in the western portion of the Arizona Strip ca. 1873 and produced at least four successful mining ventures. Mining on the Kaibab Plateau picked up with a boom in the 1890s, when the Warm Springs District was formed. The earliest ventures at Warm Springs, led by the Petosky Mining Company and the Coconino Copper Company, failed within a few years as a result of the lack of transportation and other resources (Altschul and Fairley 1989).

An increase in copper prices during WWI renewed interest in copper on the Kaibab Plateau, prompting John Mackin to stake several mineral claims in 1916. In 1928, the St. Anthony Copper Company was organized, began mining the Mackin claims, and constructed a railroad to the former Coconino Copper Company site at Ryan. Another spike in copper prices during WWII led to the formation of the Apex Mining Company, which took over the Mackin deposits in 1943 (Altschul and Fairley 1989).

Hack's Canyon in the western Plateau was claimed in the 1890s and mined by hand until the early twentieth century. The Canyon Copper Company constructed a tramway to the bottom of the canyon during WWI. The company produced copper ore until 1946 and was reorganized as the Hacks Mining Company in 1951 after the discovery of uranium in the ore. The Hacks Mining Company leased out their mining claims, which resulted in little production, and the mine sat idle from 1954–1957. More leases and exploration from 1957–1964 yielded little, and the mine sat idle again until 1977. Energy Fuels Nuclear leased and eventually purchased the mine and produced uranium from three sites in the canyon until 1987, followed by two years of environmental cleanup (Billingsley et al. 1997).

In 1890, Fred Nellis found a surface outcrop 45 miles north of Williams that contained copper. Calling it the Anita Mine, he teamed up with others in 1897 to build a railroad to haul a steam tractor to the site and constructed a smelter in Williams. The Anita Mine went bankrupt the following year, and the rail line was purchased by the Santa Fe & Grand Canyon Railroad. As with most railroad ventures, numerous financing and related management changes occurred until the AT&SFRR took over and finished the line in 1901. Once the track was extended from the AT&SFRR line through Williams north to the South Rim, the Grand Canyon Railway began transporting tourists to the Grand Canyon (Billingsley et al. 1997; Stein 2006).

In 1902, William Lockridge bought up the Anita Mine's claims. He hauled the smelter from Williams to the mine and was convinced that a new chemical method would be profitable. He and his men sunk shafts more than 500 feet below surface but had little luck. The mine mostly closed for a second time in 1905. In 1907, Lockridge sent six ore cars to the Verde Valley Smelter, averaging \$1,200 per car. By 1910, the mine had been closed for good (Billingsley et al. 1997; Stein 2006).

In 1893, Daniel Hogan filed a claim on the South Rim of the Grand Canyon. After serving as a Rough Rider under Teddy Roosevelt in the Spanish-American War, Hogan began mining his "Orphan Mine" in 1903. Uranium was discovered in the deposits and mined by the Golden Crown Mining Company from the early 1950s through 1969. In 1953, the Mining Company purchased 10 acres in Tusayan to house mine workers in a U-shaped campsite (Coconino County 1995).

Other mining endeavors south of the Grand Canyon included cinders for road construction starting in 1920 and continuing into the 1930s; flagstone for building material mined near Ash Fork; and limestone from the same area, used for cement. Cinder and flagstone quarries are still in operation in the area (Billingsley et al. 1997; Stein 2006).

I.4.16 Tourism and Recreation

It was quickly learned that more money could be made by bringing visitors to the Canyon than by mining. There were three factors that influenced tourism and recreation in the region: the presence of the Grand Canyon, the development of forest transportation, and the instability of other local industries, such as mining, lumber, and ranching. Although tourism did not become a significant forest use until the 1920s, it did have roots in much earlier years. Early on, recreational activities were limited, travel was difficult, and accommodations were very rustic. The draw of the Canyon compensated for the rough facilities.

Tourism enterprises on the Arizona Strip began with John W. Young, son of Brigham Young, when he started his cattle ranches in House Rock Valley. As noted above, Young enticed Buffalo Bill Cody to

guide a group of English aristocrats through the area in 1891, but the isolation of the Arizona Strip from transportation thoroughfares rendered tourism infeasible until well into the twentieth century.

A pattern of bridle paths and wagon ruts interwoven through the Arizona Strip between the ranches of House Rock Valley and the Kaibab Plateau, west to the mines of Hacks Canyon and St. George, and north to Fredonia were the only “roads” in the Arizona Strip in the early 1900s; none reached the rim of the Canyon until 1917–1918. Funds were appropriated in the 1920s for improved roads, and construction began in the 1930s on a system that remains in place today (Anderson 2000).

South of the Grand Canyon was a different picture, with tourism developing in the late 1800s. The best-known stage line to cross the Kaibab National Forest was the Flagstaff–Grand Canyon Company. From 1892 to 1901, for \$20.00, the stage carried passengers for approximately 70 miles, from the trail depot to the South Rim of the Grand Canyon. Starting in Flagstaff, it headed northwest to Grandview Point. A stage station was established at Moqui Tanks, which was at the approximate halfway point of the route. No more than a small cabin, it did have water, which had to be hauled in. In 1883, Pete Berry (see above) built the Grandview Hotel at the end of the line (Putt 1991).

Two brothers, William and Phillip Hull, brought tourists to the Grand Canyon for the first time in 1884 via a wagon road they had built from Flagstaff to their sheep ranch. In 1885, their new partner, John Hance, built a cabin on the South Rim to house the guests the Hulls brought from Flagstaff by stagecoach. Hance operated asbestos mines at the bottom of the Canyon and led tourists down his mine trail to the river. Also in 1885, William Bass built two roads: one from Williams, the other from Ash Fork to the South Rim. In addition to mining asbestos claims, Bass operated a 12-room hotel at his camp and provided the only rim-to-rim trail in the Canyon (Anderson 2000; Billingsley et al. 1997).

Ralph Cameron was probably the biggest entrepreneur, laying claim to many of the better locations on the South Rim. Along with his brother, partner Pete Berry, and others, Cameron improved a Havasupai trail (now the Bright Angel Trail) in 1891. Berry obtained a franchise to operate the “Cameron Trail” as a toll road that same year (Billingsley et al. 1997).

By 1901, the Santa Fe and Grand Canyon Railroad had been completed from Williams to the Anita Mine camp. The AT&SFRR purchased the line from the owners of the mine and completed the tracks to the South Rim. From 1901–1968, the Grand Canyon Railway shuttled tourists between Williams and the South Rim before enduring a nearly 30-year hiatus in service. In 1902, Bass managed to get a flag stop on the railroad for his hotel and tour business, which operated until 1923. The AT&SFRR and the Fred Harvey Company constructed the El Tovar Hotel on the South Rim in 1905, and shortly thereafter, Daniel Hogan completed the Grand Canyon Trading Post (now the Grand Canyon Inn) near his Orphan Mine (Billingsley et al. 1997).

Cameron and his partners completed the Cameron Hotel at the head of the Cameron Trail in 1903, and Cameron began to file mining claims at strategic points along the trail. In one year he obtained 39 mining claims, including the area at the head of the trail (Cape Horn), the only water source along the trail (Indian Garden), and the section of trail along the Colorado River. Berry’s franchise for operating the trail as a toll road expired in 1906, and the trail reverted to Coconino County. As a member of the County Board of Supervisors, Cameron convinced the County to allow his friend Landes L. Ferrall operate the trail. The AT&SFRR filed for control of the trail; however, through his political influence, Cameron subverted the claim. In 1909, the General Land Office invalidated Cameron’s mining claims on the grounds that they were devoid of minable ore; at the same time, the AT&SFRR began a plan for its own trail and development that would bypass Cameron’s trail (Anderson 2000). In 1910, Cameron began selling off his claims to investors from New York and Philadelphia, selling the last of them to the Santa Fe Land Company in 1916 (Billingsley et al. 1997). After Grand Canyon National Park was established in 1919, Cameron became a U.S. Senator and retained control of the trail despite legal action from the Forest

Service against his claims (Anderson 2000). In 1923, he was sued once again, this time for not removing his structures and employees from the Cape Horn and Indian Garden areas. After losing his senate seat in 1926, Cameron gave up his hold on the trail, and in 1928 the title for the “Cameron Trail” was transferred to the NPS (Billingsley et al. 1997).

The area was put under Forest Service control in 1905. That same year, rangers began to use the abandoned Hull cabin, making it the Grand Canyon’s first administrative office. One of first tasks was to deal with overgrazing and encounters between tourists and cattle along the rim. Fencing was required as a condition of a grazing permit for the first time. Trails were being constructed and improved. By 1908, when President Theodore Roosevelt established Grand Canyon National Monument, a shanty town had developed along the rim. The new legislation gave the Forest Service the ability to plan and restrict growth. The first forest management plan was finished in 1909 (Anderson 2000).

The Fred Harvey Company, a contractor with the AT&SFRR, constructed many service buildings between 1902 and 1919 that are still in use today, such as the El Tovar Hotel, Hopi House, mule barns, Fred Harvey Garage, Lookout Studio, and Hermit’s Rest. As a for-profit company, however, the Railroad and the Harvey Company did little to provide for the Forest Service employees or to keep up the roads. The lack of accommodations for visitors who arrived by car, the lack of organization of staff quarters, the rampant grazing and fuel-wood cutting occurring in the forest, and a cultural shift emphasizing the importance of protecting natural resources led to the creation of Grand Canyon National Park in 1919. The Forest Service retained control of the forested areas north and south of the Park, and the Park was placed under the control of the fledgling NPS (Anderson 2000).

Before WWI, tourism was not the focus of business in the regions around the Grand Canyon in part because of the success of ranching and timber industries (Putt 1991). Local residents appeared to be more focused on trying to develop the Kaibab National Forest’s mineral resources. Following WWI, however, with the ensuing economic slump and the lack of a viable minerals industry, local residents started looking for other opportunities. With the spread of the automobile across the nation, more and more people slowly began to travel and visit places like the Grand Canyon and its surrounding forests.

With the growing popularity of the “road trip” and the new east-west continental and Verde Valley roads, support facilities such as gas stations, motels, and restaurants began to spring up. Unfortunately, there were few campgrounds, picnic facilities, hiking trails, and fishing locations. Ad hoc camping locations with multiple fire rings and trash scattered all around became a big problem along the road. To address some of these issues, the Forest Service and local commerce groups teamed up to develop scenic resources and centralized recreation sites. Dispersed camps were too difficult to manage and created health and fire hazards. In response to the increasing need, the Regional Forester announced in 1921 that each national forest was to assist the local community to locate and develop campgrounds as well as locations for summer cottages and hotels (Baker et al. 1988:127–129).

In 1933, a National Plan for American Forestry, better known as the Copeland Report, was issued. This document was the result of a congressional investigation of forestry for the purpose of outlining a coordinated plan that would “insure all of the economic and social benefits which can and should be derived from productive forests by fully utilizing the forest land” (Putt 1991). The investigation was called for by Senator Royal S. Copeland of New York in Senate Resolution 175 (72nd Congress, 1st Session, 1932). This report marked a change in how the forests were administered, from simple custodial oversight to one of active resource management. Along with conservation and protection measures, Copeland recommended increased planning for recreational use (Putt 1991).

As a result of the Copeland Report, the Regional Forester reported in 1934 that recreational planning and development began to take precedence over all other Southwest Region projects (Baker et al. 1988:130). In the 1930s, as visitation by the public doubled, funding for such projects began to increase dramatically.

Concurrently, the CCC began to station large crews in the region, ready to take on projects. Ultimately, with their many improvement projects, the CCC helped drive the tourist industry in Arizona. Tourism boomed after WWII in part because of the new roads, trails, campgrounds, and facilities that the CCC had provided. The CCC improved Arizona's national and state parks, national forests, and recreation areas. They built ranger stations and support facilities. They expanded transportation and communication infrastructure, which helped to attract both visitors and new residents. Just before WWII, tourism grew to become the No. 3 most important industry, behind mining and railroads. Today, with the early help of the CCC, tourism has grown to the No. 1 position in Arizona (Booth 2002).

I.4.17 Civilian Conservation Corps

The problem in the West with soil erosion and overgrazing prompted the federal government to institute a soil conservation program in the United States (Seymour 1995). At least 25% of all youths between the age of 15 and 24 were unemployed, and another quarter of the country was underemployed during the Great Depression. The CCC employed thousands of workers in dozens of camps to rectify the soil, vegetation, and erosion problems. Down from an original 8 million acres of old-growth forest, by the 1930s, less than 1 million acres remained. This and the combination of overgrazing and drought created massive soil erosion problems.

CCC camps were located throughout Arizona. Workers built roads, improved springs, constructed earthen tanks and soil erosion features, built fences, and reseeded soils. They built new roads and bridges for access into the nation's forests. Even before Roosevelt became President, a few subsistence camps for the unemployed were operating in California and Washington, and relief work had begun in a limited fashion in the nation's forests. The men were clothed and fed by the various states and worked for the federal government.

As the economic crisis continued to worsen in the beginning of 1933, President Franklin D. Roosevelt laid out a plan to employ 500,000 men in a variety of conservation tasks. Under the authority of the Emergency Employment Act of March 31, 1933, President Roosevelt established the Emergency Conservation Work (ECW) by Executive Order 6101 on April 5, 1933. Then, the CCC was created by an act of Congress on June 28, 1937. The ECW had been incorrectly referred to as the CCC and by this act, the ECW programs were transferred to the CCC and the popular name legally adopted. The CCC was already a functioning program; therefore, the president gave the effective date of the act as March 31, 1933.

The purpose of the CCC was to provide employment and technical training to the unemployed, a limited number of veterans, and American Indians. Terms of enrollment were for six months, and at the end of six months, they had an option to re-enlist for another period, for a maximum of two periods. This was later changed to an unlimited number of terms.

The enrollee was paid \$30 a month, \$25 of which was sent back home. The \$5 was for the enrollee to spend in the camp store or during their recreational visits to the local town. In many cases, this was the only income that families had. Room, board, clothing, tools, and medical facilities were provided by the government. Table I-1 shows the period listings and number of camps occupied in Arizona for the duration of the CCC in this state (Enrollment Period Listings, National Archives). Table I-2 provides the abbreviations for the types of camps occupied.

The first camp in the country was a 13-acre camp located in the George Washington National Forest, Virginia. It was designated F1 and opened on April 17, 1933. It finally closed on May 25, 1942 (Cohen 1993). The first camp in Arizona was A-1 at Fort Huachuca. Two hundred fifteen men were sent there on May 9, 1933, from Tucson, Ajo, Bisbee, Douglas, and Nogales (Booth 1991:32).

There were four kinds of enrollees nationally by the end of 1933. These were 250,000 junior enrollees between the ages of 17 and 25; 25,000 veterans; 25,000 Local Experienced Men serving as project leaders in the junior camps; and 10,000 American Indians enrolled in the Indian Division. A junior enrollee had to be single and from a family on relief, pass a physical examination, and enlist for a minimum of 6 months (Booth 1991; Cohen 1993; Government Printing Office 1939). Men came from blue collar, middle-class, and rural families in Arizona. In Graham County, many were Hispanic (Booth 1991:29–30). Although there were no women’s camps in Arizona, several camps in New Hampshire and New York enlisted women (Cohen 1993:8).

In response to the worsening drought in 1934, Roosevelt increased enrollment nationally. He ordered 50,000 junior and 5,000 veteran enrollees from urban areas to be added. He wanted a total of 600,000 people enlisted. Enrollment peaked, however, at 502,000 people nationally in September 1935 (Cohen 1993:24). From this date on, enrollment decreased until it was below 400,000 in 1937. Despite the drop, on April 2, 1937, the President proposed that the CCC be made a permanent agency. Although this did not occur, the program was extended through 1940.

Beyond changing the name to the CCC, the 1937 act increased authority by dropping the relief requirement for enrollment and added education and training opportunities. It also, for the first time, set a maximum number of participants at 315,000. In June 1939, an extension was granted through June 30, 1943.

Table I-1. Enrollment Periods in Arizona (Enrollment Period Listings, National Archives, Washington)

Period	Date	Number of Camps Occupied
1	1933	23
2	winter 1933–1934	30
3	1934	19
4	winter 1934–1935	27
5	1935	59
6	winter 1935–1936	49
7	1936	?
8	winter 1936–1937	37
9	1937	?
10	winter 1937–1938	30
11	1938	26
12	winter 1938–1939	?
13	1939	27
14	winter 1939–1940	28
15	1940	27
16	winter 1940–1941	27
17	1941	17
18	winter 1941–1942	15
19	1942	5

Table I-2. Types of Camps in Arizona and Their Abbreviations

Abbreviation	Type of Camp
F	National Forest
NP	National Parks
SP	State Parks
NM	National Monuments
SES	Soil Erosion Service
SCS	Soil Conservation Service
BR	Bureau of Reclamation
DG	Division of Grazing
G	Grazing Service
A	Army
CP	County Park
MA	Metropolitan Area
FWS	Fish and Wildlife Service

In the CCC's nine-year history between 1933 and 1942, there were more than 120 camps in Arizona. In and adjacent to the proposed withdrawal areas, there were six camps in what is now Grand Canyon National Park, three near Fredonia, and 11 in the area around Flagstaff/Williams. There were also several more in the St. George area. The CCC "projects fell into four intertwined categories: 1) resource protection; 2) resource development; 3) rural infrastructure construction; and 4) recreational development" (Booth 1991:25).

Several camps were located near or within the withdrawal area (Table I-3). The timber industry in northern Arizona enlisted the CCC to help with forest fires. They also needed help eradicating trees with twig blight on the Kaibab National Forest. Several camps worked on removing trees with this disease (Booth 1991:69). The CCC also implemented the forest plan that had been written years before but that because of lack of funding and manpower had not been implemented. The CCC reseeded thousands of acres with ponderosa seedlings.

Camps at the Grand Canyon helped with construction at the village. They also built trails for improved public access. By 1935, Grand Canyon had four camps completing projects such as controlling insects, constructing roads, fighting twig blight, running a trans-canyon telephone line, and constructing a pumping system to bring water from Indian Gardens to the South Rim (Anderson 2000:27).

In May 1933, Camp NP-1 opened at the bottom of the canyon in order to begin construction on the Colorado River Trail (Purvis 1989, 2002). Camp NP-2 was opened at the east end of Juniper Hill. By July 1933, its 200 men had arrived from all over Arizona. The next year, NP-4 was opened, and the CCC was put to work building fences to keep the cattle out of the Park. A partial list of projects completed by the CCC in and near the village can be found in the Grand Canyon Village Cultural Landscape document (JMA, Inc. 2004).

Table I-3. CCC Camps in and near the Proposed Withdrawal Area

Camp No.	Company No.	Camp Name	Enrollment Period (6-month terms)	Date Opened	Comments
CP-2	1837	Hualapai	15, 16	5/19/1940	
DG-44	2557	Fredonia	6	10/20/1935	Not in Enrollment Period Listings
DG-45	2558	St. George, Utah	6	10/27/1935	Pipe Spring, 160 miles south of Maysville—not in Enrollment Period Listings
G-135	1820	Short Creek	15, 16, 17	4/6/1940	
G-170	847	Fredonia	15, 16, 17, 18	8/10/1940	Antelope Springs, 399 miles northwest of Phoenix
G-173	1814	Bull Rush	15, 16, 17, 18	8/10/1940	436 miles northwest of Phoenix
F-27	851	Bellemont	1, 2	5/26/1933	
F-28	848	Williams	1	5/26/1933	
F-28	1826	Williams	3	4/30/1934	
F-28	3348	Bill Williams	15, 16	5/5/1940	
F-28	1838	J.D. Dam	5	5/16/1935	
F-28	3348	J.D. Dam	13, 15	5/14/1939	J.D. Dam, 9 miles south of Williams
F-28	2833	J.D. Dam	7	4/30/1936	J.D. Dam, 9 miles south of Williams
F-29	1823	Williams	3	4/30/1934	
F-38	1838	Williams	5	5/16/1935	J.D. Dam, 9 miles south of Williams
F-5	311	Flagstaff	13	5/20/1939	5 miles north of Flagstaff
F-5	821	Flagstaff	1, 3	5/28/1933	5 miles north of Flagstaff
F-6	863	Flagstaff	1, 5, 7	6/2/1933	
F-75	863	Columbine	11	5/22/1938	
F-75	822	Pivot Rock	19	5/21/1942	
F-75	863	Pivot Rock	9, 11, 13, 15, 16, 17, 18	5/27/1939	
F-75	2855	Pivot Rock	9, 11	5/29/1937	
F-80	311	Flagstaff	15, 17	6/3/1940	
F-80	822	Flagstaff	17	6/24/1941	3.5 miles north of Flagstaff
F-80	842	Flagstaff	18	6/24/1941	

After 1935, the CCC program went into decline. As the economy began to recover in the mid- to late 1930s, the need, or at least public opinion regarding the need, became less. In 1937, Roosevelt tried to make the CCC a permanent agency; however, he was unsuccessful. In 1940, the CCC cut the number of camps from 40 to 22, and by 1941, there were only 15 operating in Arizona. After the start of U.S. involvement in WWII, the CCC was used for wartime protection of local facilities. Some camps were used to renovate or build military facilities. The Army started moving barracks to military reservations to house troops and even Japanese prisoners in California.

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