

ATTACHMENTS

ATTACHMENT A
Curriculum Vitae for Rich Burtell

RICHARD THOMAS BURTELL

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EDUCATION

- M.S. Hydrology, University of Arizona (1989)
- B.S. Geology, University of Pittsburgh (1986)

CERTIFICATION/TRAINING

- Registered Geologist, Arizona (No. 33746)
- Mine Geochemistry , Hydrology and Water Treatment Workshops (EPA, 2013)
- Section 404 Permitting and Groundwater Plume Analysis Workshops (AHS, 2012)
- Stream Restoration Course (WMG, 2011)

SUMMARY

Mr. Burtell is an environmental scientist with 25 years of project and management experience. Areas of expertise include water rights and demand analyses; evaluation of ground and surface water resources; remote sensing; land ownership assessments; environmental compliance; investigation of mine, fuel and waste storage facilities; contaminant hydrology; and, collection and analysis of environmental data. Management duties have included supervision of staff and consultants, project planning and coordination, report preparation, and litigation support.

EMPLOYMENT

- Plateau Resources LLC
Principal and Owner
Phoenix, AZ (2011-Present)
- Arizona Department of Water Resources
Manager, Adjudications and Tech Support
Phoenix, Arizona (1999-2011)
- Golden Environmental Management
Senior Project Manager
Tempe, Arizona (1998-1999)
- Montgomery Watson
Supervising Hydrologist/ Geochemist
Arizona and Colorado (1992-1998)
- Golder Associates Inc.
Project Hydrologist/Geochemist
Denver, Colorado (1990-1992)
- U.S. Geological Survey
Staff Hydrologist/Geochemist
Orlando, Florida (1989-1990)
- Phelps Dodge Inc.
Hydrogeologist – Summer Intern
Morenci, Arizona (1987)

EXPERIENCE

Project

- Evaluation of ground and surface water resources including aquifer testing, model development and review and GW/SW interactions
- Water rights analysis and legal review
- Stormwater, Section 404 , and mine exploration permits
- Preparation of Environmental Impact Statements and Aquifer Protection Permits
- Water demand determinations for agricultural, municipal, industrial, and riparian uses
- Phase I/II Environmental Site Assessments
- Remote sensing and surface mapping
- Contaminant hydrology and transport/ geochemical modeling
- Characterization of fuel and solid/ hazardous waste facilities
- Collection and analysis of hydrologic, geologic and water quality data

Management

- Supervision of enviro. staff (up to 15 geologists, hydrologists, GIS analysts and administrative assistants) and consultants
- Project planning and scheduling
- Proposal and report preparation including document publication
- Coordination with interdisciplinary teams, stakeholders and regulators
- Litigation support (expert testimony, technical advisor to court, and settlement negotiations)
- Third party and peer review
- Budget development and control

COMMITTEES

- Water Resources Development Commission (served on Water Supply and Demand Committee)
- Western Navajo-Hopi Water Supply (Kyl) Study
- Upper San Pedro Partnership (served on Technical Advisory Committee)

AWARDS/HONORS

- Arizona Department of Water Resources
 - Supervisor of the year
 - Section of the year
 - Team and individual special achievement
- University of Arizona
 - Meritorious performance as teaching assistant
- University of Pittsburgh
 - Representative of graduating class
 - Tarr Award, Sigma Gamma Epsilon
 - Summa cum laude

PROFESSIONAL ORGANIZATIONS

- Arizona Hydrological Society
- Arizona Geological Society
- Arizona Water Well Association
- Arizona Riparian Council
- SME (Maricopa Section)

RECENT PUBLICATIONS/REPORTS

- *Estimated Water Demand and Conservation Potential of Domestic Wells in the Sierra Vista Subwatershed, Arizona* (2012)
- *Water Supply Options and Potential at the Fancher Mill Site* (2011)
- *Assessing Water Supply Vulnerability in a Water Scarce State: The Arizona Water Sustainability Evaluation* (prepared with Kelly Lacroix and Linda Stitzer and presented at the XIV World Water Congress, 2011)
- *Multi-Sector General Stormwater Permit Applications for the Ajo, Carlota, Fancher and Zonia Mines, Arizona* (2011)
- *Response to Comments and Objections Filed on ADWR's June 2009 Subflow Zone Delineation Report for the San Pedro River Watershed* (2011)
- *Land Ownership Within the San Pedro Riparian National Conservation Area* (2010)
- *Mapping of Holocene River Alluvium along the Verde River, Central Arizona* (prepared in cooperation with the Arizona Geological Survey, 2010)
- *Arizona Water Atlas, Volumes 1 through 8* (2006-2010)
- *Catalog of Non-Exempt Registered Wells, Zuni Indian Water Rights Settlement* (2009)
- *Subflow Zone Delineation Report for the San Pedro River Watershed* (2009)
- *Preliminary Hydrographic Survey Report for the Hopi Indian Reservation* (2008)
- *Identification of Irrigated Lands in the Gila River Maintenance Area* (2008)
- *Review of the Settlement of Public Water Reserve No. 107 Claims in the San Pedro River Watershed* (2007)
- *Technical Assessment of the Tohono O'odham Nation, Gila River Indian Community, and Zuni Indian Tribe Water Rights Settlements* (2006)

RECENT AND CURRENT PROJECTS

- Analysis of federal reserved right claims and subflow-related issues, AZ (confidential client)
- Aquifer Protection Permit for a marble quarry near Dragoon, AZ (Alpha Calcit Arizona Ltd.)
- Aquifer testing, well siting, and ground-water quality assessment for the proposed Fancher gold mill near Salome, AZ (Luxcor Gold)
- Exploration permit for the Idaho Placer Claim near Prescott Valley, AZ (various investors)
- Geochemical characterization of impacted waters and stormwater and 404 permitting for the Zonia copper mine near Prescott, AZ (Redstone Resources Corporation)
- Hydrogeologic and well permitting support for reclamation of the St. Anthony uranium mine, NM (Pueblo of Laguna)
- Litigation of Bonita Creek water rights issues near Payson, AZ (various plaintiffs)
- Navigability assessment for major instate streams, AZ (confidential client)
- Water supply evaluation of the Arctic Ice and Water company (various investors)
- Water use and conservation potential of domestic wells in the Sierra Vista Subwatershed, AZ (Western Resource Advocates)

ATTACHMENT B
1891-1896 Resurvey of International
Border

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REPORT

OF THE

International

BOUNDARY COMMISSION

UPON THE

SURVEY AND RE-MARKING OF THE BOUNDARY BETWEEN
THE UNITED STATES AND MEXICO
WEST OF THE RIO GRANDE,
1891 TO 1896.

PARTS I AND II.

PART I.

REPORT OF THE INTERNATIONAL COMMISSION.

PART II.

REPORT OF THE UNITED STATES SECTION.

WASHINGTON:

GOVERNMENT PRINTING OFFICE

1898.

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PART II.

REPORT

OF THE

UNITED STATES SECTION

OF THE

INTERNATIONAL BOUNDARY COMMISSION,
UNITED STATES AND MEXICO.

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Bisbee is Tombstone, once one of the great mining camps of the world, but now containing about 1,500 inhabitants, and bearing on all sides evidences of depression and decay.

About 4 miles south of Monument 90 is located the Mexican custom-house of La Morita, recently moved there from the San Pedro River. From the Mule Mountains to the end of parallel $31^{\circ} 20'$ the country is fairly thickly settled, and the distance between watering places nowhere exceeds 10 or 12 miles; consequently in this region it is not necessary, as heretofore, to describe all available water in detail.

The San Pedro River, in the vicinity of the boundary line, is ordinarily a stream of about 15 feet in width and 6 or 8 inches in depth, fringed with a fine growth of cottonwood and willow, and possessing the distinction of being the only southern tributary of the Gila which has an uninterrupted flow throughout its entire length. The valley bordering the river is very fertile, but the bed of the river has sunk so deep that irrigation is attended with many obstacles, and consequently but a very limited portion of the valley is under cultivation. On the east bank of the San Pedro, a few miles south of the line, is the little village of San Pedro, where until very recently was located the Mexican custom-house, now removed to La Morita. A good road leads from Benson, through the San Pedro Valley, to the high table-lands of northern Sonora.

From the San Pedro River the slope rises rapidly, but uniformly, to the Huachuca Mountains, over the southeastern end of which the line passes at an elevation of about 6,100 feet. These mountains and their lower slopes are covered with a heavy timber growth generally similar to that found on the San Luis Mountains. They are the highest embraced within the limits of the survey, attaining, at a point about 4 miles north of the boundary, an elevation of about 9,400 feet. At the foot of the mountains, about 15 miles north of the line, is beautifully situated Fort Huachuca, an important post garrisoned by four companies of infantry and two of cavalry.

From the Huachuca Mountains to the San Rafael Valley the line passes over a beautifully picturesque grazing country, badly cut up by cañons, from which it descends into the San Rafael Valley, the name by which is known that portion of the valley of the Santa Cruz River lying east of the Patagonia Mountains and adjacent to the boundary line.

The Santa Cruz River rises in the hills a few miles north of the boundary, flows south into Mexico for about 15 miles, then turns around the south end of the Patagonia Mountains and flows north, again crossing the boundary line, and continuing its generally northern direction, flowing for a short distance and then sinking beneath the sands, to reappear again, until it disappears finally a short distance beyond Tucson. The stream is bordered by a noble growth of cottonwoods, whose bright green leaves were a welcome sight after the ashen-green color of the vegetation previously encountered. That portion of the valley of the river which lies in Mexico is very fertile, and a considerable part of it is under cultivation. The little town of Santa Cruz is picturesquely situated in this valley at the foot of the mountains, about $7\frac{1}{2}$ miles south of the line.

In the San Rafael Valley, at La Noria, is situated the United States custom-house, from which a rough road leads to Crittenden, on the Arizona and New Mexico Railway, and a good road down the Santa Cruz Valley and around the Patagonia Mountains to Nogales.

Leaving the San Rafael Valley the line passes over the rough, oak-clad foothills of the Patagonia Mountains, which it crosses in a gap a short distance north of San Antonio Pass, at an elevation of about 5,600 feet. These mountains are quite picturesque, being heavily wooded, the growth consisting principally of oak, with a few conifers on the higher slopes. They are rich in minerals and contain some of the first mines worked by Americans in Arizona. The San Antonio Pass, an excellent one for pack animals, crosses this range a little south of the line and cuts off the tedious detour along the Santa Cruz Valley.

From the Patagonia Mountains the line descends over a badly cut up hill country to the Santa Cruz River, which it crosses for the second time. The elevation of the river is about 3,675 feet, and it is somewhat singular that the two lowest points on the boundary between the west end of parallel $31^{\circ} 20'$ and the Initial Point on the Rio Grande differ in elevation less than 16 feet from each other, and less than 23 feet from the Initial Point on the Rio Grande. The two points in question are at San Bernardino Creek and the second crossing of the Santa Cruz River, the former being the lower of the two.

From the Santa Cruz the line begins to ascend, passing over a hilly country, the broken and cut up character of which increases to the termination of the line in the Sierra de los Pajaritos at an elevation of about 4,800 feet.

Two other tanks, of which no previous knowledge had been obtained, were discovered a short distance above the heads of the two valleys which indent the east side of the mountains between 1 and 2 miles north of the boundary. These had each a capacity of about 600 or 800 gallons.

The road from Sonoyta to Yuma passes by Agua Dulce, Agua Salada, Tule Wells, and the Tinajas Altas, from which point it keeps on the east side of the mountain range and parallel to it to the valley of the Gila, down the south side of which it passes until the town of Yuma is reached. In "the fifties" the road forked about a mile north of the Tinajas Altas, the west fork going through the pass at this point, and thence directly over the Yuma Desert to the town of Yuma. This part of the route, however, was soon abandoned on account of the heavy sand and the loss of life from thirst. The road between Agua Dulce and Yuma is for the most part very heavy, and, until the Tule Wells were reopened, no certain supply of water could be counted on between Agua Dulce and the Colorado River. This road is appropriately called by the Mexicans "El camino del Diablo." When traveling it for the first time, alone or with but few companions, it is hard to imagine a more desolate or depressing ride. Mile after mile the journey stretches through this land of "silence, solitude, and sunshine," with little to distract the eye from the awful surrounding dreariness and desolation except the bleaching skeletons of horses and the painfully frequent crosses which mark the graves of those who perished of thirst—grim and suggestive reminders when the traveler's supply of water is running low. In a single day's ride sixty-five of these graves were counted by the roadside, one containing an entire family, whose horses gave out and who, unable to cross the scorching desert on foot, all perished together of thirst. Their bodies were found by some travelers during the following rainy season, and were all buried in one grave, which is covered with a cross of stones and surrounded with a large circle of stones, inside of which not a bush nor a blade of grass grows. Near by lie the skeletons of their horses and the broken fragments of their water bottles.

During the few years that this road was much traveled, over 400 persons were said to have perished of thirst between Sonoyta and Yuma, a record probably without a parallel in North America.

Leaving the Sierra de las Tinajas Altas the line crosses the Yuma Desert and descends into the valley of the Colorado, terminating at the point where it intersects the axis of the channel of that river.

The name Yuma Desert is applied to the entire country included between the Gila River, the Gila Range, the Gulf of California, and the Colorado River, a region without water and covered for the most part with shifting sands and a scrubby growth of greasewood. Parallel to the Gila Range and separated from it by a valley 4 or 5 miles in width is a range of hills which begins about a mile or two north of the line and extends northwest for a distance of 15 or 20 miles.

About halfway across the desert the line crosses a ridge of drifting sand 2 or 3 miles in width and then a low, volcanic ridge which borders it on the west. Many miles to the south is seen a perfect sea of sand out of which rise jagged, isolated peaks and extinct volcanoes. Everywhere else is an endless succession of sandy swells and hollows sloping gradually down to the Colorado River. Descending abruptly from the desert the line passes over the fertile valley of the Colorado and terminates in the channel of that stream.

Section 5, Colorado River.—The Colorado, like the Rio Grande, is a variable stream, carrying an immense amount of sediment, and is generally navigable by light-draft steamers throughout the year for several hundred miles above its mouth. The river floods in June, during which time great changes of channel take place in those reaches, which, like the boundary section, are bordered by alluvial banks. The river valley along this section is many miles in width and is covered with a dense growth of mesquite, cottonwood, willow, arrowwood, quelite, and wild hemp. The soil is exceedingly fertile from the frequent inundations, and would doubtless produce fine crops.

The Colorado River along the boundary is peculiar in that its course does not follow the lowest depression between the Gila Range and the Coast Range, but lies some 50 or 60 miles east of this depression, and at an elevation of over a hundred feet above it. Nor does it seem, as is sometimes contended, that this elevation is due entirely to the constant deposition of sediment along its banks and the consequent elevation of its bed, for the profile along the boundary over

the Colorado Desert, west of Yuma, shows the same gradual and uniform downward slope, until the depression at Salton River is reached, and on this desert no alluvial sediment appears ever to have been deposited either in recent or past ages. Moreover, in slope, elevation, and composition, this desert appears but a continuation of that on the east side of the valley.

This river is also remarkable for the very high tides at its mouth, and for the "bores" which at certain phases of the moon come rushing up the tidal portion of the stream, threatening with destruction all small craft encountered.

At the junction of the Gila and Colorado is located the flourishing little town of Yuma, which before the advent of the Southern Pacific Railway furnished supplies for almost all of Arizona and New Mexico. The town still supplies the mining camps on the Colorado River and its vicinity, and has become quite a resort for persons afflicted with pulmonary troubles. Extensive projects for irrigating and cultivating the fertile lands of the Colorado River Valley and vicinity are now being promoted, but up to the present time practically none of this land is cultivated, except by Indians.

The river valley from Yuma to the gulf is inhabited only by Yuma, Co-co-pah, and Diegeño Indians, peaceable and light-hearted people, fond of games, excellent swimmers, and delighting, like all savages, in painting their faces and bodies. The men are noticeable for their splendid physique, but the women are generally fat and unattractive in appearance. As a rule they possess no firearms, and on the lower reaches of the river may yet be seen hunting with the bow and arrow. They still cremate their dead, frequently burning at the same time the rude hut and personal effects of the deceased.

Section 6, azimuth line from the Colorado River to the Pacific Ocean.—Starting at the Colorado River, the line passes for about two-thirds of a mile over the fertile river valley, then rises to the water-washed mesa southeast of Pilot Knob, a prominent, isolated mountain about a mile north of the line. Over this mesa the line passes for about 3 miles, when it encounters several high ridges of drifting sand, all of which it crosses in a distance of about 4 miles.

From the sand hills to Salton River, a distance of about 27 miles, the line passes over a flat desert, similar in appearance and vegetation to the Yuma Desert, and forming a part of the Colorado Desert, the name which is applied to the entire country included between the mountains north of the Southern Pacific Railway, the Colorado River, the Gulf of California, and the Coast Range. From Salton River to a point a little over a mile east of the north spur of Signal Mountain, a distance of about 21 miles, the line passes over an alluvial depression, a considerable portion of which is covered at intervals of several years by the overflow from the Salton and New rivers, as was the case in the summer of 1891, when their overflow filled the dry bed of the Salton Sea, and for a time threatened to submerge the tracks of the Southern Pacific Railway in this vicinity.

To understand the nature and cause of these overflows it is necessary to describe somewhat in detail the topography of this region for a considerable distance on both sides of the boundary line.

About 5 miles below the boundary the Rio Padrones, a branch of the Colorado, ordinarily about 75 feet in width, and having a very swift current, separates from the main stream and flows in a generally southwest direction, emptying into a lake several miles in length, called Jululu Lake.

This lake lies some 15 or 20 miles south of the boundary line, and near its west shore are the famous mud volcanoes of the Colorado Desert, while a short distance west of these loom up the bare, rocky ridges of the Co-co-pah Mountains. The outlet of this lake, known as Hardys River, flows in a generally southeast direction, and unites with the Colorado some 20 miles above its mouth.

The area included between the Colorado and these western branches is intersected by numerous "blind channels," which are all filled when the Colorado overflows.

At times of extraordinarily high water in that river another channel, which branches from the Colorado in the same locality as does the Rio Padrones, becomes filled, and under the name of Salton River flows west for about 30 miles, then northwest for about 50 miles, and empties into the depression called Salton Sea. At the same time Jululu Lake becomes so filled from the overflow that a portion of its waters seeks an outlet by a channel called New River, which flows in a northwest direction for about 60 miles, and also empties into Salton Sea. When the flood in the Colorado subsides these streams cease to flow, and their courses are marked by a succession of

mountains. It overlooks the valley of San Bernardino and a large extent of country both to the northeast and southeast. The maximum difference in the offsets on this parallel between the United States and Mexican determinations occurred here, amounting to 1.6 meters, the Mexican position being south of the American.

No. 81, another sectional monument, was located less than 1 mile west of No. 80. It occupies the highest point of the line in crossing the Perilla Mountains and affords a superb view in all directions.

About 1 mile farther west, among the hills leading toward the Sulphur Spring Valley, No. 82 was rebuilt of masonry on the site of old No. 19. It stands near the road connecting the San Bernardino and San Pedro valleys. To the southeast of this monument is a conspicuous landmark known as the "Niggerhead," a tall, steep rock surmounting one of the highest mountains of this range. The Mexican name of this peak is Cerro Gallardo.

From the Perilla Mountains to the San Pedro River, a distance of about 42 miles, the line was marked with 15 solid iron monuments, at intervals varying from 1 to 4 miles, the average being about 3 miles.

The country along this part of the boundary is unobstructed by mountains or deep ravines, and but for the severe rains which occurred during the period of operations the transportation and erection of monuments would have been attended with little difficulty. The most serious obstructions were in the low valleys, especially at the Sulphur Spring bottom, where, owing to the almost constant rains, the roads were at times nearly impassable. The rich soil of these valleys, stimulated by the heat and unusual moisture, produced in a few days a growth of vegetation bordering upon the magical.

No. 98, near the western bank of the San Pedro River, was rebuilt on the site and from the remains of old No. 20.

The San Pedro River flows through an alluvial valley in which are located numerous ranches. About 7 miles south of the boundary is a small Mexican village, San Pedro, which until recently contained the Mexican custom-house, since moved to La Morita. The bed of the stream has been sunk by the attrition of the current 8 to 15 feet below the surface of the ground, and is from 30 to 60 feet in width. In ordinary seasons but little water is found in the stream, but during the operations of the monument party in this vicinity, heavy floods caused the river frequently to rise bank full, and as there are no bridges its depth at times seriously interrupted communication between opposite banks.

Three and one-half miles west of the river No. 99 was located on the ascending slope of the mesa toward the Huachuca Mountains. Nos. 100, 101, and 102 were placed high up on spurs of these mountains. They are all sectional, their parts having been carried to their locations on pack animals. They are specially notable on account of their high altitude and the rough and rugged nature of the adjacent country. No. 100 occupies the most easterly spur or ridge, at a distance of 3 miles west of No. 99, and is 1,840 meters above sea level, commanding an extensive view to the east as far as the Perilla Mountains. No. 101, about one fourth of a mile farther west, occupies a still higher spur, being 1,848 meters above sea level, and marking the second highest point on the entire boundary. No. 102, a little more than a mile west of No. 101, stands upon a third high spur at an altitude slightly less than that of No. 100, overlooking a wide broken country westward across the Santa Cruz Valley as far as the Patagonia Mountains.

No. 103 was located about $3\frac{1}{4}$ miles farther west, in the foothills of the Huachucas, a well-wooded country much broken by ravines. No. 104, $1\frac{1}{2}$ miles farther on, was located on a plain, and near the wagon road connecting the San Pedro Valley with that of the Santa Cruz. No. 105, about $1\frac{3}{4}$ miles beyond, stands on a high ridge west of a deep ravine. The latter contains a creek, in which flows at times an abundance of fine water. In locating this monument on the 17th of July the party encountered one of the severest rainstorms of the season, which flooded the entire country and filled the usually dry ravines with rushing torrents.

Four miles further west No. 106 was built of masonry on the site of old No. 21. Standing upon a wide, unobstructed plain, it presents a fine landmark.

About a kilometer east of this point is the dividing line between Pima and Cochise counties. A small, square, sheet-iron shaft, marking the southern extremity of this line, was found 5.11

ATTACHMENT C
Supplying Historic Military Posts of the
Southwest

FORTS AND SUPPLIES

THE ROLE OF THE ARMY
IN THE ECONOMY
OF THE SOUTHWEST, 1846-1861

Robert W. Frazer

UNIVERSITY OF NEW MEXICO PRESS
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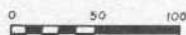
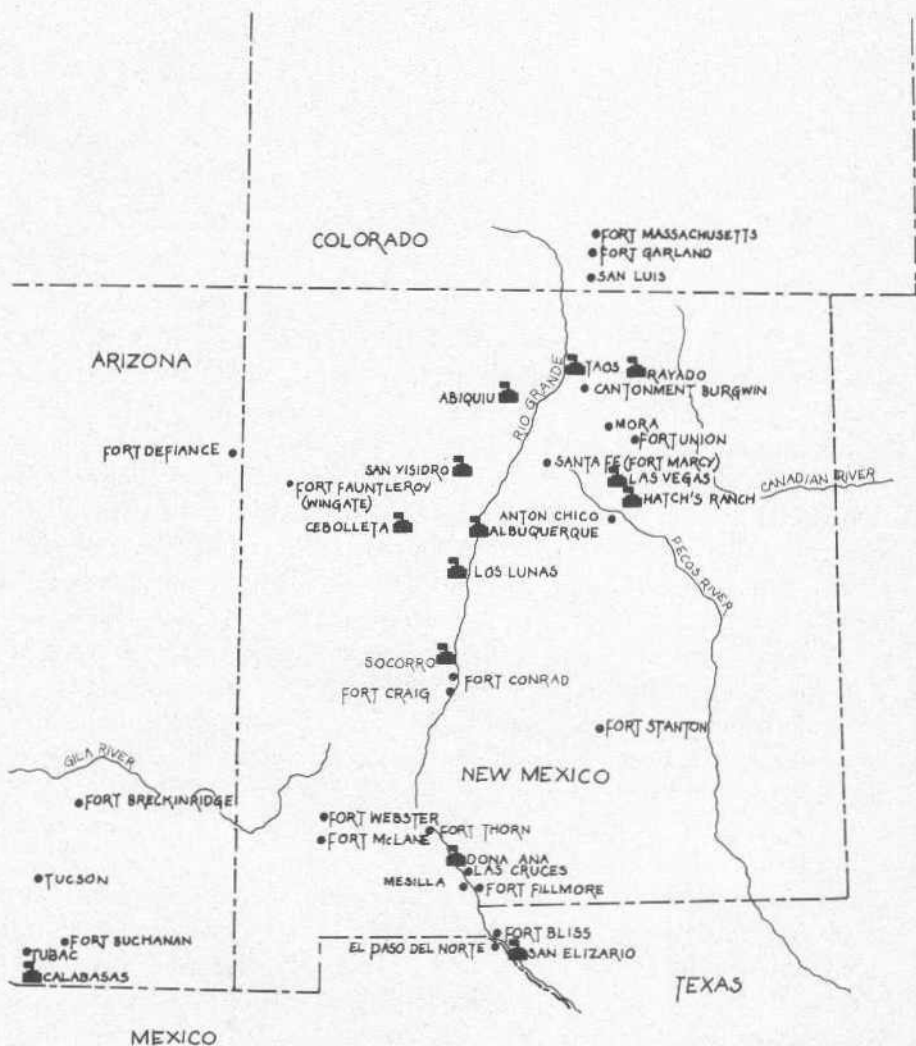
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First edition.



■ INDICATES LOCATION OF MILITARY POSTS OTHER THAN FORTS
 ○ PRESENT-DAY STATE BOUNDARIES

DRAWN BY SHARITA ELLY GORDON

The thinking remains only long enough to dry, shrink, and tumble out, never to be replaced, lest it should destroy a new system of ventilation which its absence has established. During the wet weather the mud roofs are worse than useless—save it be for the purpose of giving dirty shower baths to the unhappy occupants. . . . The picket lines used for stabling purposes are in front of and close to the barracks. Stables, corrals, pigpens, root-houses, open latrines, and dwellings, are indiscriminately scattered all over the camp, wherever the fancy of the owner prompted him to squat. The physical nature of the ground renders anything like uniformity or regularity impossible.⁴⁴

The hospital, constructed of adobes with a raised earthen floor, was the only building considered adequate by Colonel Johnston; but Surgeon William J. Sloan stated flatly that it was "equally [as] primitive and unsuitable" as the others.⁴⁵ It is clear that Fort Buchanan was the least prepossessing military post in the department, though not necessarily the most uncomfortable.

The problem of supplying the post began as soon as Steen's command reached the Santa Cruz Valley, and to this problem Steen contributed. The train which accompanied him from the Rio Grande brought a six-month supply of commissary stores, as well as all other supplies deemed necessary for the support of four dragoon companies. General Garland hoped that some items of subsistence could be obtained in the vicinity of Tucson, but he was prepared to freight everything required by the post from the Rio Grande Valley for an indefinite period. A wagon train loaded with stores for Elias Brevoort,⁴⁶ the post sutler, left Fort Thorn under escort in November 1856, and a quartermaster's train followed in February 1857.⁴⁷

Shortly after Camp Moore was established, Steen recommended that no more flour, beef, salt, or beans be sent from the general depot because, he claimed, they could be secured more advantageously locally.⁴⁸ As a result, plans to send an additional six-month supply of flour to Camp Moore were dropped. However, almost as soon as this was done, Steen approved an estimate for commissary stores, including 176,000 pounds of flour, 200 bushels of beans, 250 bushels of salt, and 450 head of beef cattle. Then, to add further confusion, he announced that beef cattle and beans could be purchased more cheaply at the post than in the Rio Grande Valley. However, in his estimate of commissary funds required for the first quarter of 1857, the only items for which he requested an appropriation were fresh beef and sheep. Cattle could be purchased for

\$18 per head, less than in the more eastern part of New Mexico, but sheep cost a relatively expensive \$3 per head. The total sum requested by the commissary for the quarter was \$7,618, including \$5,000 for meat animals and \$1,000 for cattle feed.⁴⁹

Whatever hope there was of obtaining a significant quantity of commissary stores close at hand was destroyed when a power struggle flared up between Manuel María Gándara and José de Aguilar in Sonora, shortly after Camp Moore was established.⁵⁰ As Bonneville had predicted, it was unwise to place too much reliance on a foreign source for necessities. Steen, who a short time before had been so sanguine, now reported that the grain in Sonora had been burned in the fields and that other supplies on which he had counted had been destroyed.⁵¹ On March 3, 1857, he informed Garland that it would be impossible to make contracts for flour until the new wheat crop was harvested. Hence, it was "of the greatest importance that the flour estimated for and required . . . be at once forwarded." Four days later he fired off an express announcing that he had just arranged to purchase a three-month supply of flour at 11 cents per pound, presumably in Sonora, and that he could get additional flour at 9 cents. Again he asked that no more flour be sent, "even if estimated for and approved."⁵²

Colonel Bonneville was unable to understand Steen's constant "uncertainty and wavering" and suggested that Steen "be more fixed in [his] actions in the future."⁵³ In view of the unsettled conditions in Sonora and Steen's vacillation, Colonel Grayson decided to send 75,000 pounds of flour and 120 bushels of salt to Camp Moore. The salt came from the general depot, but the flour was from Hart's Santa Cruz mills. Hart furnished the train, eighteen wagons and each drawn by a ten-mule team. Thirty-five of his employees, "but few fighting men amongst them," handled the train, and the army provided a small escort between Fort Thorn and Camp Moore.⁵⁴ Obviously, this was expensive flour.

The contracts with Majors, Russell, and Waddell, drawn up in 1855 (for two years) and in 1857, provided for delivery at any of the posts in the department. In the winter of 1857 the *Gazette* reported that there were between eighty and ninety of the contractor's wagons engaged in hauling army stores to Tucson. These were drawn by oxen, six teams to the wagon, with each wagon carrying a load of 5,600 pounds.⁵⁵ However, this was not the usual situation, because most of the transportation between the Rio Grande and the Arizona post, except for Hart's flour and beans, was handled by quartermaster's trains.

Generally speaking, Fort Buchanan was adequately supplied, although

the cost remained high. Initially, at least, there was little difficulty in obtaining funds for the post. Drafts on St. Louis banks were all but useless, but drafts on the New York sub-treasury were readily exchanged in Sonora, either for stores or for such United States money as was available. On the other hand, "small coinage," dollars or smaller currency, was not to be had. Mexican coin commanded a premium of 8 to 10 percent in San Francisco and was too expensive for army use; hence, the post was dependent on what it could obtain from department headquarters.⁵⁶

In the spring of 1858, Major Steen and two of the dragoon companies stationed at Fort Buchanan were transferred to the Department of the Pacific.⁵⁷ This left only two companies of the regiment in New Mexico and elevated Captain Ewell to the command of Fort Buchanan. In October Ewell reported that he had on hand more than a year's supply of flour and more than a two-year supply of bacon for the reduced garrison. He proposed that he be allowed to purchase additional flour locally, should it be needed. This was now feasible because William and Alfred Rowlett had erected a small, modern gristmill on the Santa Cruz River adjacent to Tucson, which had commenced operation in 1857 or 1858. Ewell also suggested that it might be wise to dispose of part of the bacon before it deteriorated in weight and quality.⁵⁸

Simeon Hart had already been given a flour contract, to run to September 1, 1859, for the delivery of 110,000 pounds to Fort Buchanan at 12½ cents per pound. Of this price, 3 cents represented the cost of transportation from Fort Thorn.⁵⁹ The flour contract could not be cancelled because it was already in effect. As to the bacon, Ewell was told to keep it, for it would be difficult to replace if needed and, if properly cared for, it would be better, even after a year, "than any bacon made in New Mexico."⁶⁰ Of course, almost no bacon was made in New Mexico.

Except for the flour provided by Hart, no supplies were purchased under contract specifically for Fort Buchanan prior to 1859. Necessary stores were hauled, primarily, either by quartermaster's trains from the depot at Albuquerque, via Fort Thorn, or by the quartermaster at Fort Buchanan, who sent his own wagons to pick up stores deposited at Fort Thorn or at Fort Fillmore. As a result, Fort Buchanan had more transportation facilities than most of the other posts in the department. Just before the garrison was halved in 1858 there were twenty-two wagons with the requisite teams and equipment at the post. It was also one of the few posts authorized to employ a civilian wagon master.⁶¹

Almost everything purchased at Fort Buchanan was a little more expensive than elsewhere in the department. The same was true of stores freighted to the post. The fort's closest neighbors in the department were some 250 miles distant (actually, it was closer to Fort Yuma, a post in the Department of the Pacific, than to any post in New Mexico), and it was located almost twice as far from the general depot as any other post in the department. Fort Buchanan would have been even more expensive to maintain had it not been for the increase in local production. Quite clearly, the presence of the military attracted settlement and encouraged the development of agriculture as well as mining. Even in the short time Camp Moore was occupied, some ranching sprang up along the upper Santa Cruz Valley. Tubac, abandoned in 1848 in the face of Apache incursions, was reoccupied in 1856 and became headquarters for the Sonora Exploring and Mining Company.

When Colonel Bonneville visited Fort Buchanan in 1858 he found that below the post, wherever the valley of the Sonoita widened, farms had been opened. The industrious Pima Indians were a source of corn and beans, and they sold so much of their crop in 1859 that they were themselves virtually destitute. Bonneville noted that the laborers employed in the mines were "all Mexicans from Sonora"; and in remarking that most of the supplies for the civilian population also came from Sonora, he declared this would continue "until all the lands on the Santa Cruz and San Pedro rivers are brought into cultivation to the full extent of their waters."⁶² Apparently all of the fresh beef consumed at the post came from cattle acquired in the immediate vicinity; at least there are no records of herds driven from the Rio Grande. The commissary purchased a small quantity of flour locally, which was presumably the product of the Rowletts' Tucson mill. Even so, for the time being Fort Buchanan remained dependent on the general depot and on Simeon Hart for the great bulk of its commissary stores.

The expansion of feed production was important to the army and to the economy of the area. After the garrison was reduced to two companies, Captain Ewell stated that more corn was raised in the district than could be consumed at the post.⁶³ In the first quarter of 1858 the quartermaster bought from individuals almost 280,000 pounds of corn and 115 tons of hay. He paid 5 cents per pound, the equivalent of \$7 per fanega, for both corn and a small quantity of barley. This was a price considerably higher than was paid at any other post in the department at the time. It is not clear that the barley was grown in the vicinity, but

the price implies that it was not transported a great distance. Hay varied in price from one month to another at Fort Buchanan, moving through the narrow range of \$25 to \$27 per ton, no more than was paid at most of the other posts.

The total sum expended for local products by the quartermaster's department at Fort Buchanan during the first quarter of 1858 was \$17,298.68, which was paid out to thirteen different suppliers, and, in addition to feed, included lime, charcoal, and adobes. Adobes at this time cost the much higher price of \$14 per thousand.⁶⁴ As long as Fort Buchanan was garrisoned by four dragoon companies the quartermaster issued an average of almost 160,000 pounds of corn monthly. Hay consumption varied between 49 and 93 tons during the months for which records are available, the amount decreasing as the season advanced and as grazing improved. The post employed two expressmen, one wagon master, one blacksmith, one interpreter, and varying numbers of teamsters and herders. When scouting expeditions were made into Apache country civilian guides were hired at wages ranging from \$2 to \$5 per day, but there was not the consistent use of spies and guides that there was elsewhere in the department. The total amount paid to civilian employees was less than \$1,000 per month.⁶⁵

In the autumn of 1857 Garland finally acted to accomplish something that he had proposed since his first days as department commander. He ordered one of the two companies stationed at Fort Massachusetts to withdraw to Cantonment Burgwin as soon as cold weather arrived; and the first frost came very early at the foot of Mount Blanca. One commissioned officer and all of the mechanics in the company were left behind to assist in constructing a new two-company post that was to be located between Ute and Trinchera creeks, about eight miles south of Fort Massachusetts but still some fifteen miles north of the closest settlement. However, the new post would be built away from the foothills and upon the valley floor, where it would be in a much better position to offer protection to the settlers.⁶⁶

The new post, still under construction, was occupied on June 24, 1858. A civilian was hired at \$85 per month to set up a sawmill and to supervise the cutting of lumber; and John M. Francisco, the post sutler, provided adobes under contract.⁶⁷ All buildings were constructed of adobes, and only the officers' quarters and the commissary storehouse had wooden floors. When Colonel Johnston inspected the post in August 1859 it was nearing completion, and he described the buildings as "adequate." He

also remarked that it was connected to Albuquerque and Fort Union, "the two points from which military stores are received—by roads in many places barely practicable."⁶⁸ Two distinct benefits were derived from the relocation. Even though the fort was located at an elevation of just under eight thousand feet, the post garden was more successful than the garden at Fort Massachusetts had been, and there was a notable improvement in the health of the garrison. The post was originally referred to as the New Post of Fort Massachusetts, but it was soon designated Fort Garland.

General Garland gave some thought to establishing or relocating other posts, particularly if additional troops were assigned to the department. By 1858, William Pelham,⁶⁹ surveyor general for the territory, had pushed the survey of public land down the Canadian River Valley toward the Texas boundary, where he reported that the country had excellent agricultural potential. At the same time, preparations were under way to open a mail route from Neosho, Missouri, to Albuquerque. To protect the mail route and to encourage settlement Garland recommended the establishment of a four-company post near the junction of Ute Creek and the Canadian River in Kiowa-Comanche country.⁷⁰ This he proposed as a replacement for the badly run-down Fort Union, which he believed no longer served a useful purpose where it was, not to mention the excessive rent paid for the reservation.

Fort Buchanan also continued to be a candidate for change. In addition to public dissatisfaction with its location, its shoddy construction, and its unhealthiness, there was a more compelling consideration: the projected Butterfield Overland Mail. That the overland mail would require protection from the Apaches seemed probable, and that Fort Buchanan was improperly located to provide such protection was certain. Captain John W. Davidson, who conducted a minor campaign out of Fort Buchanan against the Coyotero Apaches early in 1858, suggested that a post established at the junction of the San Pedro River and Aravaipa Creek would control the Coyoteros and thus would protect the settlements, the mail route, and eventually a railroad. As was almost always the case in such proposals, Davidson asserted that all necessary facilities for building and maintaining a post were available near the site and claimed that "an enterprising officer having four companies under his command, at this point, could subdue the Coyotero nation within a year." Major Steen agreed and predicted that if Fort Buchanan were relocated "large settlements" would be made in the valleys of the Gila and San Pedro, and

within a year corn would be less expensive than in the Rio Grande Valley.⁷¹ Garland was ready to make the move, but when two of the four companies stationed at Fort Buchanan were ordered to California he did not pursue the matter.⁷²

Fort Thorn, although otherwise satisfactory, was unhealthful. Fevers, described by Surgeon William J. Sloan as malarial, were prevalent at the post throughout much of the year.⁷³ The sickly nature of Fort Thorn was attributed to its location. James L. Collins, who was appointed Superintendent of Indian Affairs for the territory in 1857, hoped to settle all of the Apaches, including the Jicarillas and Mescaleros, near the Gila River. He urged Garland to move the post to a point near the headwaters of the Gila, so that it would provide protection for an Apache agency. Garland agreed to give serious consideration to the request.⁷⁴ Scheduled for possible relocation, then, were Forts Thorn, Union, and Buchanan. Although Garland made none of the changes his proposals had their influence on future planning.

During his tenure as department commander Garland established two entirely new posts, reestablished the post opposite El Paso del Norte, and relocated three of Sumner's posts. A line of posts protected the full length of the Rio Grande that lay within the jurisdiction of the department; and there were posts located in the country of all Indian groups considered hostile, except in that of the Comanches. True, the western Apaches were, for the most part, unaffected by the presence of the military; but, throughout the department, posts were located within, or close to, all significant areas of settlement. What had been accomplished did not represent a change in the pattern of troop distribution laid down by Colonel Sumner, but it was instead an expansion along the same lines.

General Garland was not well in the summer of 1858 and, obviously concerned about the state of his own health, he summoned Colonel Bonneville to Santa Fe to replace him while he took a "temporary absence" to visit the East. On September 15, 1858, accompanied by Assistant Surgeon Jonathan Letterman, Garland left Santa Fe after placing Bonneville in command of the department.⁷⁵ Garland fully expected to return to New Mexico and, as a result, Bonneville was permitted to retain the command longer than might otherwise have been the case. Bonneville provided an active administration, yet one that followed, in most respects, the general policies of his predecessor.

In March 1859 Bonneville ordered the abandonment of Fort Thorn

and the removal of most public property to Fort Fillmore. Window casings, doors, and other salvageable materials were recovered from most of the buildings. The hospital, "in complete order," was left in the care of a civilian, Ammon Barnes, who operated the ferry at the San Diego crossing; and one storeroom remained intact for the use of parties passing up and down the river.⁷⁶ Because the intent was to establish a replacement for Fort Thorn, Collins again asked that it be located near the headwaters of the Gila.⁷⁷ In June, Bonneville ordered a detachment of twenty Mounted Riflemen to the Santa Rita copper mines, which were again being worked; there, the Riflemen were to provide a token protection until the new post could be established.

After conferring with Doctor Michael Steck in regard to a suitable site, Bonneville sent three companies, under the command of Captain and Brevet Major William H. Gordon of the Third Infantry, to select the specific location for "a permanent encampment" situated toward the southeastern end of the Burro Mountains and close to Mangas Coloradas Spring, where it would occupy a site "overlooking and commanding the valley of the Mimbres on the east, and an outlet westwardly towards the Rio Gila."⁷⁸ Major Gordon spent several days examining the area before selecting Ojo del Lucero (a spot no longer identifiable) as possessing the best attributes for a post. Assistant Surgeon George E. Cooper, who accompanied the command, provided assurance that the region was healthful.⁷⁹

First Lieutenant George W. Howland was left, with a company of Mounted Riflemen, to establish the camp. He commenced erecting stone stables and "made every arrangement for the winter." He praised the site: plentiful grass and wood; excellent pine timber within twelve miles; and an abundance of water for the post, including water for a garden. Indians came into the camp in large numbers each day, and Howland reported they were pleased that the government was taking an interest in their welfare. However, on September 19, Bonneville ordered the company "temporarily stationed" at the Burro Mountains to return to Fort Fillmore to participate in his contemplated campaign against the Apaches.⁸⁰ The post had existed too briefly to have any lasting effect on the area.

Bonneville visited Fort Buchanan in the summer of 1859 and agreed that it was "entirely out of position." The buildings were in such poor condition that if the post remained where it was it would have to be completely rebuilt. He recommended that it be replaced by two posts: one located northeast of Tucson at the base of the Santa Catalina Moun-

tains, and the other situated in the San Pedro Valley a few miles north of the overland mail route.⁸¹ Surgeon Sloan, who prepared a comprehensive report on the health of the post and the adjacent country, called the causes of disease at Fort Buchanan "exciting." He believed that the health of the troops would be measurably improved if they were moved to a "high, dry, airy plain" about one mile north of the existing post.⁸² However, for the moment, Fort Buchanan remained unmoved and unrepaired.

While Bonneville was absent on his southern tour, the Comanche Indians drew attention to themselves. Increased travel along the Fort Smith (Canadian River) route and the continuation of the public land survey down the Canadian Valley aroused Comanche distrust, and they let it be known that they did not intend to allow settlement in their country. The need for a post was reemphasized when Comanches seized the members of a small survey party and then released them a few hours later, after the captives had agreed to discontinue their work.⁸³ Both Bonneville and Collins questioned the wisdom of pushing surveys into areas so far beyond the frontier of settlement, but they believed that it was necessary to keep open the Fort Smith route and to protect the short-lived Neosho-Albuquerque mail line.⁸⁴

John S. Phelps, a Missouri congressman and a long-time proponent of improved wagon roads and mail service between his state and New Mexico, arrived in Santa Fe, in July 1859, to accompany Collins to a council with the Kiowas and Comanches. Collins requested a military escort and, at the same time, invited Bonneville to join the party, both for the effect his presence would have on the Indians and, "much more," for his interesting company.⁸⁵ The proposal appealed to Bonneville, not only because it provided an excursion into a part of the department he had not yet visited but because it would permit him to examine the valley of the Canadian for a site suitable for a post to replace Fort Union.

Earlier in the year, as a result of an appropriation of \$13,400 to rebuild the quarters and storehouses at Fort Union, Garland had appointed a board of officers to determine whether the sum was adequate to accomplish the desired work. However, the board recommended that instead of attempting to renovate the badly deteriorated post it should be moved about four miles east of the existing site and there be completely rebuilt. Because most of the stores freighted from the States were transhipped at Fort Union, thus requiring the maintenance of government trains at both Fort Union and Albuquerque, Bonneville considered it more logical

to select an entirely new site, a place preferably on public land, where the general depot, the ordnance depot, and a garrison to protect both depots could be consolidated. Hopefully, this would bring about a reduction in expenses, notably in the quartermaster's department.⁸⁶

Primarily as a result of Bonneville's proposal, Colonel Johnston was specifically directed to determine whether Fort Union should be rebuilt or relocated.⁸⁷ Johnston inspected Fort Union on July 7 and 8, and he found the buildings, except for the magazine and quartermaster's storehouse, in such poor condition "that none of them are worth repairing." Even the storehouse, "from careless construction or bad materials, [was] an unfit depository for valuable property." After examining the post and the proposed site adjacent to it, he pronounced the latter much the better of the two; however, neither was useful for the protection of the frontier, particularly for protecting the ranches expanding to the south and east. He and Bonneville agreed that it would be far better to move the post into the area where the Comanches perpetrated their depredations. Admittedly, this would delay the removal of Fort Union, but it was already too late in the year to commence erecting a post to be built primarily of adobe.⁸⁸ Johnston joined the Comanche council party so that he could pass judgment on the sites along the Canadian.

The party left Santa Fe on July 18, picked up an escort of 130 soldiers at Hatch's Ranch,⁸⁹ then moved down the Canadian as far as the mouth of Ute Creek. The Indians, although they had been informed that Collins was coming to engage in peaceful talks, were made cautious by the presence of so many soldiers. Apparently fearful that they were to be punished for their past misdeeds, they departed before Collins arrived. No talks were held, nor was a post site selected. Unlike earlier official assessments of the intrinsic value of the Canadian Valley, Bonneville and Collins found the country through which they passed "perfectly worthless." Phelps, with a small escort, went on to Missouri, and the rest of the party returned to Santa Fe.⁹⁰

Colonel Johnston resumed his tour of inspection, concluding it as far as the Department of New Mexico was concerned at Fort Bliss on October 12. He had inspected the twelve existing posts and was critical of six of them. He recommended that Forts Buchanan and Union be replaced by new posts in more favorable locations; and he proposed that Cantonment Burgwin and Los Lunas be abandoned, for neither served a valid military purpose, in his opinion. When it came to sites for new posts he was less specific. Of Fort Buchanan he said only that it should be moved to a new location less prone to sickness. For Fort Union he proposed a site

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The Approach of the Civil War

Throughout the decade of the fifties the army had concerned itself with the economical operation of the department, though never more overtly than during the command of Colonel Sumner. Military purchases of New Mexican products increased appreciably in quantity and variety during the later years of the decade, but prices remained high in comparison with those paid for similar goods in the East. Even though local production had grown in response to the expanded market, the great bulk of the stores required by the army were still freighted to New Mexico. The cost of transportation declined slightly in each successive contract, but it remained a significant item of expense.

Transportation was a major factor in the cost of maintaining the posts established in the territory acquired through the Gadsden Purchase. Agricultural development near Fort Buchanan, although limited, led to a decline in the price of a few articles, but the cost of most goods remained higher here than elsewhere in the department. The desire to reduce costs was probably a factor in the unusual decision made by Secretary of War Floyd in 1859, when he awarded Theodore W. Taliaferro of Alabama the privilege of furnishing all commissary and quartermaster's stores usually purchased in the "territory of Arizona"¹ for one year at prices not to exceed those previously paid by the army.² The arrangement was unique, for this was the first time that the business of internal supply had been removed from the determination of the department commander and his appropriate staff officers.³

Taliaferro arrived in New Mexico before notification of his concession had been received by the department headquarters. When he reached Fort Buchanan he found that the only contract available to him was for corn, and he arranged to furnish the quartermaster with 490,000 pounds

at 4 cents per pound (\$5.60 per fanega), a full cent less than had been paid previously at the post.⁴ Dissatisfied with the very limited outcome of what he had expected to be a lucrative venture, Taliaferro returned to the Rio Grande where he encountered a train bound for Fort Buchanan with a load of flour milled by Simeon Hart. From Fort Fillmore, he complained that this was an infringement of his agreement with the War Department, and he asked Bonneville for an interpretation of his rights, including what redress he might expect to obtain in the matter of the flour.⁵

Hart did not hold a flour contract for Fort Buchanan in 1859, but Colonel Grayson had authorized him to delay deliveries under the 1858 contract and to make them "from time to time, instead of quarterly." This did not constitute an increase in quantity, but it did involve a shift in allocations of some of the flour intended for Forts Bliss and Fillmore, where the garrisons had been reduced, and for Fort Thorn, which had been abandoned. Second Lieutenant Horace Randal of the First Dragoons, the acting commissary at Fort Buchanan, was apparently unaware of Grayson's arrangement with Hart, and in view of Taliaferro's concession, Randal refused to accept a consignment of Hart's flour when it was presented for delivery. Hart appealed to Representative John S. Phelps of Missouri, who carried the complaint directly to Floyd. The Commissary General's Office recommended that "all contracts made for Fort Buchanan prior to the arrival of Mr. Taliaferro [sic] at that post be carried out in good faith."⁶ It was fairly obvious that communications between Washington, Santa Fe, and Fort Buchanan were neither swift nor efficient. In November, Lieutenant Randal made a contract with Taliaferro to deliver 82,000 pounds of flour during the coming year at 12 cents per pound, but the quantity was reduced by half at department headquarters because of existing commitments to Hart.⁷

In the spring of 1860 Taliaferro was joined in the business of purveyor for the army by William S. Grant of Maine. Early in March, Grant approached Floyd with the proposal that he, in partnership with Taliaferro, provide all quartermaster's and commissary supplies in "what is known as Arizona" for two years.⁸ A few days later Floyd "authorized [them] to furnish all the supplies that may be needed at all the posts that may now or hereafter be established in that portion of the proposed territory of Arizona lying south of the parallel of 33° 36' north latitude and west of the meridian 106° 35' west longitude"—except horses, wagons, and harnesses. All items were to be furnished at 12 percent less than the price paid by the army for similar goods at the posts involved

during the previous year. A "reasonable allowance" would be made to offset the cost of transportation. Included within the designated limits were Forts Buchanan and Fillmore and, after they were established, Forts Breckinridge and McLane.⁹ Once again, it is not clear why Grant was especially favored, but he too came to the Southwest with the blessings of the War Department.

The concessions made to Taliaferro and Grant caused resentment at department headquarters in Santa Fe. The staff officers involved in making purchases, particularly Colonel Grayson, cooperated as little as possible with the recipients. Even the private citizens were less than enthusiastic. Grant later stated:

When I arrived in the Territory, every trader and citizen was hostile to my contract, for under that I was obliged to buy at prices less than they persistently demanded, and tried by combinations, to force me to pay; but I always found the officers of the army on my side, and against such combinations, and they soon came to my prices, rather than have all the supplies come from Sonora.¹⁰

In May 1860 the *Missouri Republican* carried a report from its "Arizona correspondent," Thomas M. Turner, to the effect that instructions from the War Department had been received at Fort Buchanan to let all contracts "to certain party favorites *without advertising for bids*." Turner went on to predict that Taliaferro and Grant—although he did not mention their names—would in a few months become "independent for life." In June they were given a contract, to run for twenty-one months, to provide beef cattle at $7\frac{92}{100}$ cents per pound.¹¹ This was not particularly expensive beef, and the contract certainly was not intended to make the recipients independently wealthy.

In September 1860 Taliaferro sold his interests in the partnership to Grant for \$8,000.¹² Immediately thereafter Grant received a commissary contract to run to March 26, 1862. It was more specific in its terms, calling for Grant to furnish fresh beef, bacon, bacon hams, flour, beans, candles, and soap to the Arizona posts. Quantities were not specified. Flour in sacks was to be provided at $10\frac{56}{100}$ cents per pound. With one exception, this was the cheapest flour purchased under contract in the department in 1860. The commissary agreed to pay $6\frac{16}{100}$ cents per pound for beans, which was not out of line with the price at other posts. Fresh beef carried the same price as in the contract made for Fort Buchanan in June. Grant acquired much of the wheat for his flour—as well

as a large part of the beans and, apparently, all of the beef cattle—locally or in Sonora. None of the other items were available in the department, but were imported from California via Guaymas. Grant, who protested that he was to furnish “everything” required by the posts covered in the contract, also bound himself to establish a headquarters for his business in Tucson.¹³

A few days later the quartermaster signed a contract with Grant, this one also providing for delivery at all posts within the specified area. The items covered were forage (corn, hay, and topped forage), coal, lime, adobes, lumber, and wagon timbers. Prices were not stated, but the contract stipulated that all items would be furnished for 12 percent less than the army had paid for them during the past year.¹⁴ Grant’s price for corn, as well as for a small quantity of barley, was \$3.06²³/₁₀₀ per hundred pounds (approximately \$4.29 per fanega), much less than was paid for corn elsewhere in the department at the time.¹⁵ Most of the corn and all of the other quartermaster’s stores except wagon timber, which was imported ash, were local products. Grant, at times, employed more than two hundred men in his various enterprises. He sold some goods to the army below his cost, and by his own deposition, he expected to make his profit from the transportation allowance.¹⁶

The difficulty and expense of getting supplies to the relatively isolated corner of the department were eased when Governor Ignacio Pesqueira of Sonora issued a decree permitting goods for Arizona to be landed at Guaymas and transported across Sonora, with the importer paying only one-tenth of the normal import duties. Grant immediately put wagon trains to work, hauling goods shipped from San Francisco.¹⁷ In addition to handling his own goods, he offered to carry freight from Guaymas to the vicinity of Fort Buchanan for 3 cents per pound, or for 2 cents in the other direction. As the distance involved was more than three hundred miles, the rate was much cheaper than what the army paid for transportation under contract. Goods from San Francisco could be imported via Guaymas for only 5 cents per pound for the entire distance.¹⁸ Grant, of course, was not alone in taking advantage of Pesqueira’s decree. Mining companies imported quantities of their own supplies from San Francisco and exported their ore through Guaymas.¹⁹ For the settlers and mining interests the reduction in transportation costs was a useful by-product of the army’s presence.

Grant invested considerable sums of money in his various enterprises. He purchased the Rowlett gristmill for \$5,500 and spent an additional \$2,000 on improvements. He also imported machinery from California

to erect a new gristmill, which he valued at \$18,000. The latter was the only large, modern mill in the area, and was capable of grinding ten bushels of grain an hour.²⁰ Grant's milling facilities apparently were not sufficient to provide all of the flour required by the army under his contract; he continued to import flour from Sonora, keeping "a large number of wagons constantly running between the flour mills . . . near Hermosillo, and the military posts in Arizona."²¹ His two lumber camps in the Santa Rita Mountains, opened to provide pine lumber for military construction, represented an investment of \$6,150. Other real estate, erected or acquired in connection with his army business, included storehouses, corrals, and sundry buildings, and altogether it was valued by Grant at \$5,850.²² Grant also engaged in a variety of businesses that had nothing to do with his army contracts, such as a hotel in Tucson and a stage line.²³

There were some complaints about the quality of the service provided by Grant, but they came more from departmental headquarters than from the posts he supplied. In November 1860, on the order of Colonel Grayson, a special contract was made with Simeon Hart to deliver flour at several posts. Included were ten thousand pounds for Fort Fillmore at 16 cents per pound, a rate more than a half-cent higher than Grant's delivered price.²⁴ When Grayson made his estimate of commissary stores required for the year 1861-62 he included all of the items in Grant's contract, "on the supposition that he will not be able to furnish them."²⁵ Early in 1861 Grant encountered difficulty in delivering some stores when a large shipment of his goods from the East Coast was seized in Texas, which was by this time in rebellion against the United States. The shortages were filled by drawing from posts supplied from the general depot, resulting in added expense and inconvenience to the army.²⁶ Grant's commissary contract contained the provision that if he could not furnish the required quantity or quality of any item, post commissaries would make up the shortage by individual purchases or special contracts. Grant was obligated to pay the difference, if any, in price. This could be accomplished without difficulty for Fort Fillmore, but for the other posts served by Grant their relative isolation rendered the solution impracticable.

In Washington the War Department considered it unwise to trust the supply of any post to a source that might be cut off by the Confederates. "Leaving out of consideration the peculiar character" of Floyd's arrangements with Taliaferro and Grant, the Commissary Department recommended that Grant's contracts be rescinded.²⁷ In April 1861 Secretary

of War Simon Cameron expressed the opinion, without explanation, that the contract of September 9, 1860, was unauthorized and ordered that it and all subsequent contracts be revoked.²⁸ Grant's difficulties were not at an end. The failure of the Boston banking house on which he depended for funds led to the nonpayment of his drafts and seriously affected his credit in Sonora.²⁹ Actually, all this made little difference, for in July 1861 all troops were withdrawn from Forts Buchanan, Breckinridge, and McLane in the face of the impending Confederate invasion.

The Navajo conflict of 1860 delayed the abandonment of Fort Defiance and the construction of Fort Fauntleroy, but it also gave both posts an immediate importance. They served as bases of operations against the Indians, and additional companies were stationed at both forts as the campaign developed. In April 1861, following the close of hostilities, the troops were withdrawn from Fort Defiance, and the garrison of Fort Fauntleroy was reduced. Also in April, Colonel Chapman was informed that he must depend entirely on the labor of the troops to construct Fort Fauntleroy, but this was hardly an innovation, as troops had played a major part in building all of the forts in the department. Chapman was authorized to deviate as much as necessary from the approved plans in order to provide shelter for the troops and stores before the next winter.³⁰ Actually, construction of the post was not completed until after the Civil War, and never according to the original plans. Even the name was ephemeral. After Colonel Fauntleroy resigned to serve the Confederacy the post was renamed Fort Lyon in honor of Brigadier General Nathaniel Lyon, who was killed six weeks earlier in the Battle of Wilson's Creek in Missouri. In 1868 it became Fort Wingate.

Colonel Fauntleroy acted slowly to establish Fort Butler, in part because of its intended importance and in part because of his indecision in selecting a location. In April 1860, immediately after he received the order reorganizing the department, he visited the Pecos, Gallinas, and Canadian rivers, expecting to choose the site. Instead, he returned to Santa Fe convinced that neither the Canadian Valley nor the point where the Fort Smith road crossed the Gallinas had the necessary resources to support a large post and depot. The junction of Tecolote Creek and the Pecos River, although otherwise satisfactory, was too far west to serve a defensive purpose. Thus he recommended that the depot be placed at Tecolote or near the ruins of the old Pecos Pueblo church and that Hatch's Ranch be leased or purchased as the location for Fort Butler.³¹

Before undertaking his tour Fauntleroy had declared a ten-mile square reserve on the Canadian at its confluence with Ute Creek. After he

1860 (Washington, D.C., 1860), pp. 210-11.

45. Sloan to Wilkins, July 17, 1859, RG 94, OAG, LR.

46. Brevoort, who came to New Mexico in 1850, went with the army in 1856 as sutler, first at Camp Moore and then at Fort Buchanan. He acquired property in New Mexico and became a great extoller of the virtues of the Southwest. See, for example, his *New Mexico, Her Natural Resources and Attractions* (Santa Fe, 1874).

47. S. O. No. 135, October 11, 1856; S. O. No. 6, January 16, 1857, RG 393, USACC, Special Orders, DNM.

48. Steen to Nichols, November 30, 1856, *ibid.*, LR. A small quantity of flour was purchased at the post for 6 cents per pound. *Santa Fe Weekly Gazette*, December 20, 1856.

49. David H. Hastings, Estimate for Subsistence stores . . . from March 1st to December 31st 1857, December 31, 1856; Estimate of funds required . . . during the quarter ending the 31st of March 1857, November 30, 1856, RG 94, OAG, LR.

50. Aguilar was Gándara's predecessor as governor of Sonora and had been driven out of office by him.

51. Steen to Nichols, January 1, 1857, RG 393, USACC, DNM, LR.

52. Steen to Nichols, March 3, 1857, *ibid.*

53. Nichols to Steen, March 25, 1857, RG 94, OAG, LR.

54. John B. Grayson to Nichols, April 14, 1857; Simeon Hart to Bonneville, April 26, 1857, RG 393, USACC, DNM, LR.

55. *Santa Fe Weekly Gazette*, February 14, 1857.

56. Hastings to Easton, January 3, 1857; February 3, 1857; March 22, 1857, RG 393, USACC, Fort Buchanan, LS, Box 38.

57. O. No. 3, April 3, 1858, *ibid.*, Orders, DNM.

58. Ewell to Nichols, October 12, 1858, *ibid.*, LR; Gilbert J. Pedersen, "A Yankee in Arizona: the Misfortunes of William S. Grant, 1860-1861," *Journal of Arizona History*, XVI (Summer 1975): 130. Ewell noted that "with encouragement" bacon could be produced locally. As at Los Lunas, Ewell had a good garden where he raised "all kinds of vegetables except Irish potatoes, and they have never been raised in the territory." James H. Tevis, *Arizona in the '50's* (Albuquerque, 1954), pp. 62-63.

59. Henry M. Lazelle with Hart, May 15, 1858, RG 192, CGS, Reg. Cont.

60. Wilkins to Ewell, November 2, 1858, RG 393, USACC, DNM, LS.

61. Hastings to Easton, March 30, 1858, *ibid.*, Fort Buchanan, LS, Box 38; Report of Persons and Articles employed and hired at Fort Buchanan, 1858, *ibid.*, QM L and Rpts R.

62. Bonneville to Thomas, July 15, 1858, RG 94, OAG, LR.

63. Ewell to Nichols, October 12, 1858, RG 393, USACC, DNM, LR.

64. Abstract of purchases during the quarter ending March 31st 1858, *ibid.*, QM L and Rpts R.

65. Monthly reports of the quartermaster, Fort Buchanan, *ibid.*

66. S. O. No. 107, October 11, 1857, *ibid.*, Special Orders, DNM. Fort Garland was located at the present town

of Fort Garland, Colorado, about eighteen miles in a direct line east of the closest point on the Rio Grande. Although it was never much involved in suppressing Indian activities, it remained active until November 30, 1883. It is now a state historical monument.

67. Francisco's contract was later revoked over an argument as to whether he was to deliver the adobes or whether the army was to receive them where they were made. The distance involved was 800 yards. Edward R. S. Canby to [James L. Donaldson], August 13, 1860, RG 393, USACC, Fort Garland, LS.

68. Johnston to AAG, HQ Army, August 8, 1859, RG 94, OAG, LR.

69. Pelham, a native of Kentucky and former surveyor general of Arkansas, was the first surveyor general of New Mexico. He was appointed by President Pierce. He arrived in New Mexico in December 1854 and held office until 1860.

70. Garland to Thomas, August 8, 1858, RG 94, OAG, LR. The contract for the mail route was awarded to Thomas F. Bowler of Santa Fe on May 27, 1858. Morris F. Taylor, *First Mail West, Stagecoach Lines on the Santa Fe Trail* (Albuquerque, 1971), pp. 54-55.

71. John W. Davidson to Steen, March 20, 1858, and Steen endorsement, RG 94, OAG, LR.

72. Garland to Thomas, May 1, 1858, *ibid.*

73. Sloan to Wilkins, July 17, 1859, *ibid.*

74. James L. Collins to C. E. Mix, December 5, 1858, RG 75, OIA, LR, NMS.

75. O. No. 6, September 15, 1858; O. No. 7, September 15, 1858, RG 393, USACC, Orders, DNM. Garland remained in poor health and died on June 5, 1861.

76. Bonneville to Thomas, July 15, 1859, RG 94, OAG, LR.

77. Collins to J. W. Denver, February 22, 1859, RG 75, OIA, LR, NMS.

78. S. O. ———, June 12, 1859, RG 393, USACC, Special Orders, DNM. The special orders issued by Bonneville during a tour of the southern posts were not numbered.

79. William H. Gordon to Wilkins, July 28, 1859; George E. Cooper to Gordon, July 25, 1859, RG 94, OAG, LR. Lee Myers discusses the location of the camp in "Military Establishments in Southwestern New Mexico: Stepping Stones to Settlement," *NMHR*, XLIII (January 1968): 14-16.

80. George W. Howland to [Wilkins], August 16, 1859, RG 393, USACC, DNM, LR; S. O. No. 117, September 19, 1859, *ibid.*, Special Orders.

81. Bonneville to Thomas, July 15, 1859, RG 94, OAG, LR.

82. Sloan to Wilkins, July 17, 1859, *ibid.* Sloan's report was published in Coolidge, comp., *Statistical Report, 1855-1860*, pp. 218-20.

83. Collins to A. B. Greenwood, July 10, 1859, RG 75, OIA, LR, NMS; Victor Westphall, *The Public Domain in New Mexico, 1854-1891* (Albuquerque, 1965), pp. 8-9; Bonneville to Thomas, July 10, 1859, RG 94, OAG, LR.

84. *Santa Fe Weekly Gazette*, November 20, 1858; Taylor, *First Mail West*,

pp. 56–57. The mail began its unsuccessful operation in October 1858.

85. Collins to Bonneville, July 11, 1859, RG 75, OIA, LR, NMS.

86. S. O. No. 55, April 11, 1859, RG 393, USACC, Special Orders, DNM; [Bonneville] to [Thomas], April 23, 1859, *ibid.*, Unentered LR; Stewart Van Vliet to Thomas S. Jesup, September 16, 1859, RG 92, QMG, Cons. Corres. File.

87. Henry L. Scott to Johnston, May 25, 1859, RG 393, USACC, DNM, Unentered LR.

88. Johnston to AAG, HQ Army, July 11, 1859, RG 94, OAG, LR.

89. Hatch's Ranch, the property of Alexander Hatch, a native of New York, was located on the Antonio Ortiz Grant, a short distance above the junction of the Pecos and Gallinas rivers. Troops were often stationed on the ranch, sometimes for extended periods. San Miguel County Deed Book No. 1, pp. 103–106, Office of the San Miguel County Clerk, Las Vegas, N.M.

90. Bonneville to Thomas, August 6, 1859, RG 94, OAG, LR; Collins to Alfred B. Greenwood, August 4, 1859, RG 75, OIA, LR, NMS.

91. Johnston to AAG, HQ Army, July 11, 1859, RG 94, OAG, LR. The inspection reports are in *ibid.* Johnston did not inspect the temporary posts.

Chapter 7

1. O. No. 4, October 25, 1859, RG 393, USACC, Orders, DNM. Fauntleroy, a Virginian, did not attend the Military Academy. He was appointed major, Second Dragoons, when the

regiment was organized in 1836, and became lieutenant colonel in 1846. He was promoted to colonel, First Dragoons, in 1850.

2. Thomas T. Fauntleroy to Samuel Cooper, November 30, 1853; Irvin McDowell to Fauntleroy, January 4, 1854, RG 94, OAG, LR.

3. Fauntleroy to Lorenzo Thomas, November 8, 1859, and enclosure, *ibid.*

4. Beale was a native of the District of Columbia and a graduate of the United States Naval Academy. Beale's expeditions are discussed in W. Turrentine Jackson, *Wagon Roads West* (New Haven, Conn., 1965), pp. 245–56.

5. See Frank McNitt, *The Navajo Wars* (Albuquerque, 1972), p. 361.

6. William J. Sloan to John D. Wilkins, December 12, 1859, RG 94, OAG, LR.

7. Fauntleroy to Cooper, December 6, 1859, *ibid.*

8. Winfield Townley Scott endorsement on *supra*, January 7, 1860.

9. See Norman F. Furniss, *The Mormon Conflict, 1850–1859* (New Haven, Conn., 1966), pp. 205, 229.

10. The post was first named in honor of Governor Henry A. Wise of Virginia. When Virginia seceded from the Union it was designated Fort Lyon for Brigadier General Nathaniel Lyon, killed in the Battle of Wilson's Creek, Missouri.

11. Sangre de Cristo Pass is between the headwaters of Gunnison Creek, an affluent of the Huerfano River, and the headwaters of Sangre de Cristo Creek.

12. G. O. No. 6, March 12, 1860,

RG 94, OAG, General Orders, HQ Army.

13. Charles F. Smith to AAG, HQ Army, April 13, 1860; Edward R. S. Canby to AAG, HQ Army, June 24, 1860, *ibid.*; William J. L. Nicodemus to Donald C. Stith, June 24, 1860, *ibid.*, LR.

14. Stith to Dabney H. Maury, September 1, 1860, RG 393, USACC, DNM, Unentered LR.

15. G. O. No. 6, March 12, 1860, RG 94, General Orders, HQ Army.

16. S. O. No. 52, April 29, 1860, RG 393, USACC, Special Orders, DNM; Benjamin L. E. Bonneville to Cooper, July 29, 1860, RG 94, OAG, LR; William H. Wood with Fernando Lucero, and Wood with Ronaldo Seseñero, both June 5, 1860, RG 92, QMG, Reg. Cont.

17. Stewart Van Vliet with Russell, Waddell, and Majors, April 11, 1860, RG 92, QMG, Reg. Cont. (There are two contracts of this date.) Russell, Majors, and Waddell, faced with bankruptcy, were unable to fulfill the contracts and in 1861 were replaced by Irwin, Jackman, and Co. and a contract more favorable to the army. March 30, 1861, *ibid.* See also Raymond W. and Mary Lund Settle, *War Drums and Wagon Wheels, the Story of Russell, Majors and Waddell* (Lincoln, Nebr., 1966), pp. 127-30.

18. Fauntleroy to Thomas, December 1, 1860, RG 393, USACC, DNM, LS.

19. Thomas K. Jackson with Joseph Magoffin, October 24, 1860, RG 92, QMG, Reg. Cont. Joseph Magoffin, born in Chihuahua in 1847, was the son of James W. Magoffin. The con-

tract price for corn delivered at Fort Bliss in 1859 had been \$3.15 per fanega.

20. James L. Donaldson to Fauntleroy, November 13, 1860, RG 94, OAG, LR.

21. James L. Collins to Alfred B. Greenwood, October 20, 1860; November 26, 1860; January 27, 1861, RG 75, OIA, LR, NMS.

22. The quartermaster's contracts are in RG 92, QMG, Reg. Cont., and the commissary contracts in RG 192, CGS, Reg. Cont. The lateness of the season was probably a factor in the high price in the García contract.

23. *Santa Fe Weekly Gazette*, October 20, 1860.

24. The flour contracts are in RG 192, CGS, Reg. Cont.

25. The contracts are in *ibid.*

26. Canby to [Donaldson], August 27, 1860, RG 393, USACC, Fort Garland, LR.

27. Canby to [John B. Grayson], August 5, 1860; August 16, 1860, *ibid.*

28. S. O. No. 157, November 17, 1860, *ibid.*, Special Orders, DNM.

29. Canby to [Donaldson], August 21, 1860; C. Grover to [Donaldson], November 3, 1860, *ibid.*, Fort Garland, LS.

30. S. O. No. 42 and S. O. No. 43, both April 10, 1860, *ibid.*, Special Orders, DNM.

31. Fauntleroy to Thomas, June 16, 1860, and John B. Floyd endorsement, July 21, 1860, RG 94, OAG, LR.

32. S. O. No. 95, August 10, 1860; S. O. No. 98, August 17, 1860, RG 393, USACC, Special Orders, DNM.

33. Collins to Greenwood, April 8, 1860, RG 75, OIA, LR, NMS.

34. [Citizens of Doña Ana County] to Floyd, n.d., RG 94, OAG, LR.

35. John T. Sprague to Floyd, April 27, 1860, *ibid.*

36. Darlis A. Miller, "Carleton's California Column: A Chapter in New Mexico's Mining History," *NMHR*, LIII (January 1978): 23, 36n 60.

37. [Citizens of Socorro County] to Floyd, n.d., RG 94, OAG, LR.

38. Petition to James Buchanan, encl. in Henry Winslow to Manuel A. Otero, April 25, 1860, *ibid.*

39. Charles D. Poston to Floyd, n.d., *ibid.* Poston, a Kentuckian, was a director of the Sonora Exploring and Mining Company; he is sometimes referred to as the "father of Arizona."

40. Edward A. Cross to Floyd, April 20, 1860, *ibid.* The Arivaca Ranch (La Arivac) was a grant to Tomás and Ignacio Ortiz, residents of Tubac, with the final title awarded on July 2, 1833. In 1854 it was described as a deserted ranch set in hills rich in minerals. It was purchased by the mining company in 1856 for \$10,000 in gold. It was located in the present Pima County. Will Barnes, *Arizona Place Names* (Tucson, 1960), p. 259.

41. Thomas Duncan to Cooper, May 18, 1860; Gabriel R. Paul to Cooper, September 8, 1860, RG 94, USACC, OAG, LR.

42. Richard S. Ewell to John D. Wilkins, April 15, 1860, RG 393, USACC, DNM, LR.

43. See B. Sacks, *Be It Enacted: the Creation of the Territory of Arizona* (Phoenix, 1964), p. 42.

44. Ewell to Wilkins, April 15, 1860, RG 393, USACC, DNM, LR.

45. ——— to William Pelham,

April 4, 1860, RG 393, USACC, DNM, Unentered LR.

46. Ewell to Fauntleroy, October 29, 1860, RG 94, OAG, LR; Fauntleroy to Floyd, October 29, 1860, *ibid.*

47. Constance Wynn Altshuler, ed., *Latest from Arizona* (Tucson, 1969), p. 217; Statement exhibiting prices paid Grant, and Statement of William S. Grant, February 4, 1862, RG 123, U.S. Court of Claims, General Jurisdiction Case 1883, William S. Grant vs. the United States (1863).

48. Isaac Lynde to AAG, HQ Army, October 9, 1860; Lynde to Cooper, October 18, 1860, and enclosure, RG 94, OAG, LR. See also Lee Myers, "Military Establishments in Southwestern New Mexico: Stepping Stones to Settlement," *NMHR*, XLIII (January 1968): 16–18. The reservation was never officially declared.

49. Fauntleroy to Thomas, August 26, 1860; Lynde to Cooper, December 2, 1860, RG 94, OAG, LR.

50. S. O. No. 17, February 24, 1861, RG 393, USACC, Special Orders, DNM.

51. Dabney H. Maury to Lynde, March 10, 1861, *ibid.*, LS.

52. Mowry, a graduate of the Military Academy, resigned his commission in 1858 to engage in mining promotion and to work for separate status for Arizona.

Chapter 8

1. Arizona Territory did not yet exist but was under discussion. At this time it was thought that it might be formed from all of southern New Mex-

ico. See B. Sacks, *Be It Enacted: the Creation of the Territory of Arizona* (Phoenix, 1964), pp. 24-30.

2. John B. Floyd to Thomas S. Jesup and George Gibson, March 26, 1859, RG 123, U.S. Court of Claims.

3. This was not Floyd's only interference in departmental affairs. When the War Department appointed a sutler for Fort Fillmore without seeking the recommendation of the post's council of administration, as was customary, the sutler found the position untenable and resigned less than two months after his arrival. G. W. Gillespie to Floyd, November 12, 1860, Fort Fillmore, RG 94, OAG, LR; S. O. No. 34, December 3, 1860, *ibid.*

4. John R. Cooke with Theodore W. Taliaferro, September 12, 1859, RG 92, QMG, Reg. Cont.

5. Taliaferro to Benjamin L. E. Bonneville, September 25, 1859, RG 393, USACC, DNM, LR.

6. John S. Phelps to Floyd, December 14, 1859; Joseph P. Taylor to Floyd, December 16, 1859, RG 92, QMG, Cons. Corres. File. Taliaferro's name frequently appears with one *r* but he himself used two *rs* in at least some of his correspondence.

7. Horace Randal with Taliaferro, November 20, 1859, RG 192, CGS, Reg. Cont.

8. William S. Grant to Floyd, March 5, 1860, RG 123, U.S. Court of Claims.

9. Floyd to Jesup and Gibson, March 9, 1860, *ibid.*

10. Statement of William S. Grant, February 4, 1862, *ibid.* Presumably the officers to whom he referred were at the posts served by Grant.

11. Randal with Taliaferro and

Grant, June 12, 1860, RG 192, CGS, Reg. Cont.; Constance Wynn Alshuler, ed., *Latest from Arizona* (Tucson, 1969), pp. 77-78.

12. Statement of William S. Grant, February 4, 1862, RG 123, U.S. Court of Claims.

13. Randal with Grant, September 9, 1860, *ibid.*

14. Randal with Grant, September 20, 1860, *ibid.*

15. Statement exhibiting prices . . . paid Grant . . . during the years 1860 and 1861, *ibid.*

16. Statement of William S. Grant, *ibid.*

17. *Daily Alta California* (San Francisco), January 5, 1861.

18. *Los Angeles Star*, February 2, 1861.

19. *San Francisco Herald*, August 16, 1861.

20. Statement of Mark H. Dunnell, attorney for Grant, RG 123, U.S. Court of Claims; Gilbert J. Pedersen, "A Yankee in Arizona: the Misfortunes of William S. Grant, 1860-1861," *Journal of Arizona History*, XVI (Summer 1975): 129-30.

21. *San Francisco Herald*, February 7, 1861.

22. Statement of property destroyed and abandoned, RG 123, U.S. Court of Claims.

23. Pedersen, "A Yankee in Arizona," p. 133.

24. Thomas K. Jackson with Simeon Hart, November 3, 1860, RG 192, CGS, Reg. Cont. Grant's price included a transportation allowance of \$4.93²⁴/₁₀₀ per hundred pounds for delivery at Fort Fillmore.

25. John B. Grayson to Gibson,

January 25, 1861, RG 92, QMG, Cons. Corres. File.

26. W. W. Loring to Lorenzo Thomas, April 7, 1861, RG 393, USACC, DNM, LS; Pedersen, "A Yankee in Arizona," p. 134.

27. J. P. Taylor to Simon Cameron, April 3, 1861, RG 123, U.S. Court of Claims.

28. Taylor to Mark E. Dunnell, August 26, 1863, *ibid.*

29. *San Francisco Herald*, August 16, 1861.

30. Thomas T. Fauntleroy to Samuel Cooper, May 22, 1860, RG 94, OAG, LR; Dabney H. Maury to William Chapman, April 11, 1861, RG 393, USACC, DNM, LS.

31. Fauntleroy to Cooper, April 29, 1860, RG 393, USACC, Records Relating to Indian Affairs, DNM, Box 39. See also Robert W. Frazer, "Fort Butler: the Fort That Almost Was," *NMHR*, XLIII (October 1968): 253-70.

32. ——— to William Pelham, April 4, 1860; ——— to Register and Receiver of Land Office [W. A. Davidson], May 1, 1860, RG 393, USACC, DNM, Unentered LR.

33. [Fauntleroy to Cooper], June 10, 1860, *ibid.*

34. Grayson with Tomás C. de Baca, June 12, 1860; Jackson with Hart, June 28, 1860; Grayson with Stephen Boice and Michele Desmarais, September 22, 1860, RG 192, CGS, Reg. Cont. Desmarais, a native of Canada, maintained a store in Las Vegas.

35. Mesa Rica extends for several miles along the right bank of the Canadian River, which is bordered on the left bank by a series of lower mesas. The site selected was below the point

where the river emerges from the canyon between the mesas.

36. Maury to Benjamin S. Roberts, November 11, 1860, RG 393, USACC, DNM, LS; Roberts to Maury, December 8, 1860, *ibid.*, LR.

37. Fauntleroy to Cooper, December 16, 1860, *ibid.*, LS; Victor Westphall, *The Public Domain in New Mexico, 1854-1891* (Albuquerque, 1965), p. 146. The reservation was entirely on the Pablo Montoya Grant, a tract of 655,468.07 acres.

38. S. O. No. 184, December 26, 1860, RG 393, USACC, Special Orders, DNM.

39. Theophilus Hunter Holmes to Thomas, September 10, 1860, RG 94, OAG, LR.

40. Thomas to Cooper, September 12, 1860, *ibid.*; Thomas to Fauntleroy, September 12, 1860, *ibid.*; S. O. No. 5, January 25, 1861, RG 393, USACC, Special Orders, DNM; Rapahel P. Thian, *Notes Illustrating the Military Geography of the United States* (Washington, D.C., 1881), p. 79.

41. Joseph E. Johnston to James L. Donaldson, October 2, 1860, RG 393, USACC, QM L and Rpts R; Donaldson to Fauntleroy, November 13, 1860, RG 94, OAG, LR.

42. O. No. 10, December 2, 1860, RG 393, USACC, Orders, DNM.

43. Fauntleroy to Cooper, November 12, 1860, *ibid.*, LS.

44. G. O. No. 7, March 20, 1860, RG 94, OAG, General Orders, HQ Army.

45. S. O. No. 9, February 2, 1861, RG 393, USACC, Special Orders, DNM. Sloan rose to the rank of major in the Confederate army.

SOLDIERS and SETTLERS

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Darlis A. Miller



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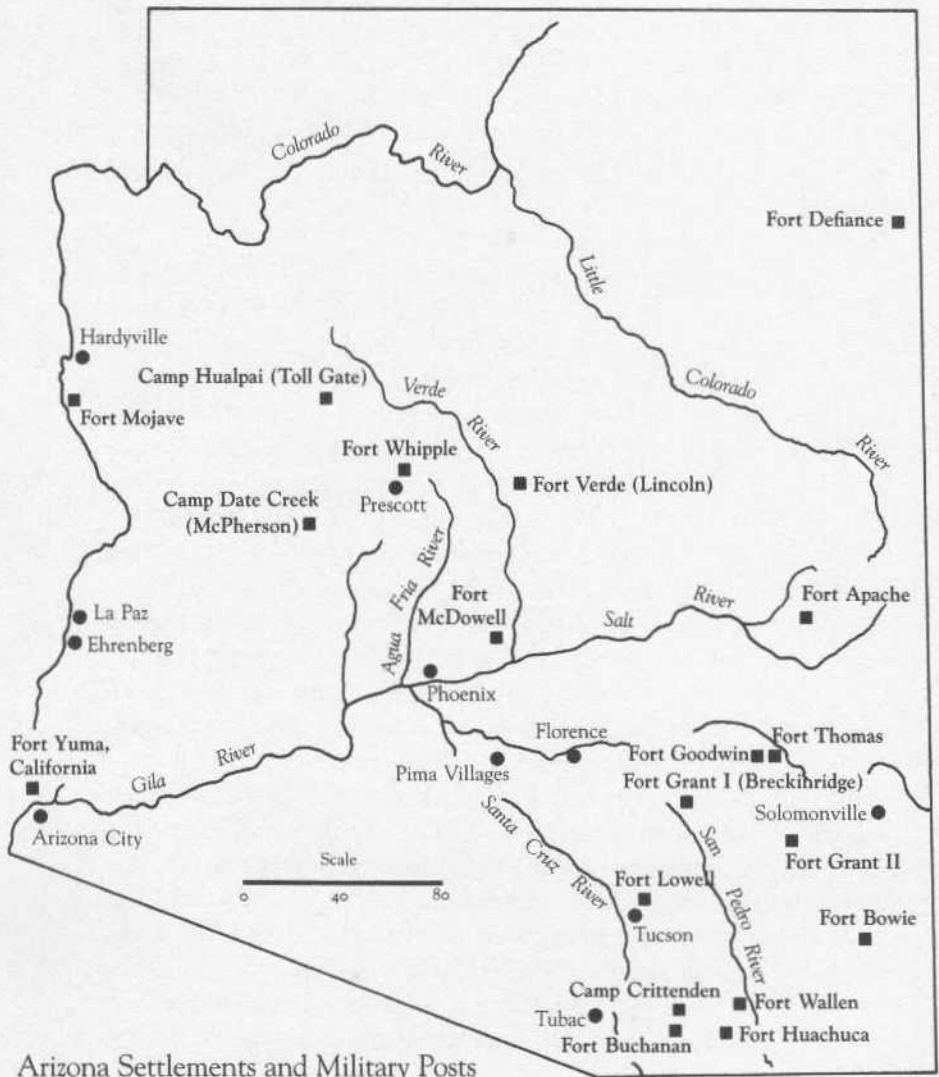
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First edition.



Arizona Settlements and Military Posts

major supply depot for military posts on the Plains—receiving from the east in a single month (July 1861) such items as ham, bacon, rice, desiccated potatoes, molasses, coffee, tea, sugar, and salt.⁸

Except for commissary, medical, and ordnance stores, the quartermaster's department purchased all other military supplies, including forage, fuel, clothing, camp and garrison equipage, horses, wagons, harness, tools, and so forth. In normal times, most equipment was shipped to New Mexico from Fort Leavenworth, but by 1861 the territory provided much of the forage, fuel, and building materials required by the army. Prior to this date, the War Department procured only a limited amount of either forage or foodstuffs in Arizona, and soldiers who were stationed there received most of their supplies from the Rio Grande. Fort Mojave, established in 1859 on the Colorado River and assigned to the Military Department of California (but later attached to the District of Arizona), was supplied primarily from San Francisco, with military stores being shipped by water via the Gulf of California and the Colorado River. A new sea and land route opened to southern Arizona in 1861 when Governor Ignacio Pesqueira of Sonora allowed American goods that were shipped from San Francisco to be transported overland from the port of Guaymas at reduced import rates.⁹ Throughout the Department of New Mexico, subsistence and quartermaster officials procured local supplies through the contract system, advertising for bids and awarding contracts to the lowest bidder. During emergencies, such as the invasion of New Mexico by Confederate soldiers, military goods were purchased in open market.

New Mexicans were unprepared for the disruption caused by the outbreak of the Civil War, but in the months that followed they contributed both manpower and supplies to the Union war effort. The military-civilian economic alliance established in preceding years would contribute to the smoothness with which officials rallied local support.

Nonetheless, when Colonel Edward R. S. Canby assumed command of New Mexico in June 1861, the department was in serious difficulty. Many southerners had resigned to join the Confederate army, leaving a shortage of officers and demoralized enlisted men who had not been paid in several months. The department lacked horses and draft animals and a two-year dry spell had produced such a scarcity of water and forage that Canby described conditions as approaching

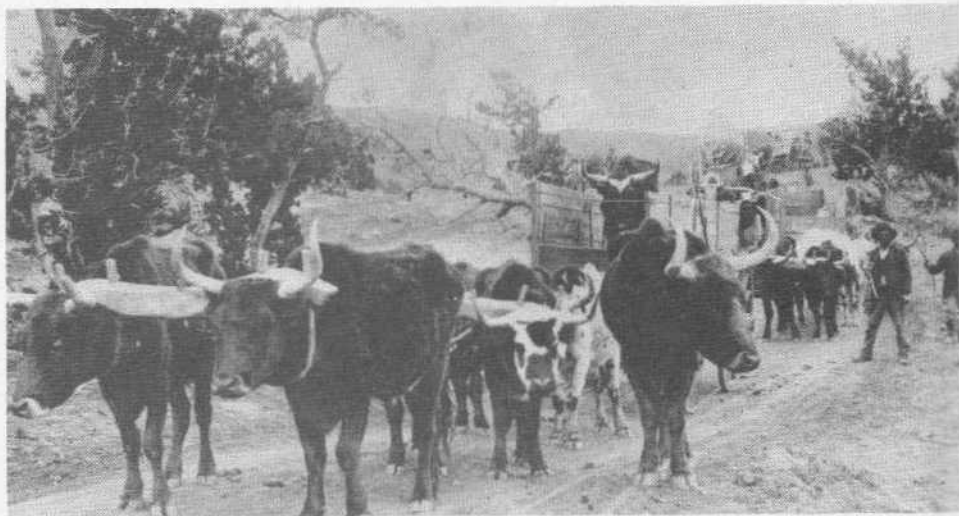
people. Enraged by this marauding, Hispanic residents took up arms, killed members of Confederate foraging parties, and drove off their livestock.⁴⁷

Canby incurred much criticism for allowing the Confederates to withdraw so easily. The Union commander, however, realized that the territory lacked provisions to feed prisoners of war, and he was in no hurry to capture Sibley's entire army. Moreover, flood conditions on the Rio Grande, delinquent flour contractors, and lack of transportation hampered Canby's efforts to concentrate supplies needed to support troop movements south of Fort Craig.⁴⁸ By the time Canby was ready to order troops into the Mesilla Valley, the Confederates had left, and the California Column under General James H. Carleton was approaching the Rio Grande from the west.

A career officer in the regular army, Carleton had served under General John E. Wool during the Mexican War and had commanded troops in New Mexico from 1851 to 1856. At the outbreak of the Civil War he was stationed in California, where he received orders in December 1861 to organize an expedition that would march east across the desert to help Canby expel rebels from the territory. A meticulous organizer, Carleton personally supervised logistics for provisioning the 2,000-man column. Supplies were purchased in San Francisco and shipped by sea either to San Pedro, to be utilized by the men marching to Fort Yuma, or to the fort itself by way of the Colorado River, where they supported the column as it moved farther east. California contractors supplied beef cattle to accompany the marching column.⁴⁹

Before the command left California, Carleton made plans to establish a subdepot on the Gila River 200 miles above Fort Yuma at the Pima villages. Although Carleton expected the column to be self-sustaining, living off supplies stockpiled at government depots, he planned to procure additional forage, wheat, flour, and beef at the Pima villages, in Tucson, and in the neighboring Mexican state of Sonora.

Carleton requisitioned 10,000 yards of manta (cotton cloth) to make purchases from the Pimas and their neighbors, the Maricopas. According to a census that Lieutenant Alfred B. Chapman completed in 1858, the Pimas lived in nine villages and numbered 4,117 individuals. The Maricopas, a much smaller tribe, lived in two villages with a population of 518.⁵⁰ By this date the Indians had a reputation



(TOP) Ox train near Camp Grant, Arizona, 1871.
(National Archives.)



(LEFT) Abraham Staab, Santa Fe merchant and military contractor. (Courtesy Museum of New Mexico, Santa Fe, New Mexico, Neg. No. 11040.)

Freighters and Railroad Agents

ON 11 JUNE 1867, Lieutenant Colonel Wesley Merritt with six companies of the 9th Cavalry arrived at Camp Hudson, Texas, about 190 miles west of San Antonio, on his way to reoccupy Fort Davis. To Merritt's dismay, the ration train, sent several days in advance of the main column, was nowhere in sight. Fearing a shortage of rations, Merritt expressed his frustration to the chief quartermaster in San Antonio in these words:

I cannot impress upon you too urgently the necessity of some means being taken to make the contract trains perform the trip to Davis and interior posts, in a reasonable length of time. At Fort Inge I hear that these trains are frequently a month on the road from San Antonio, and at Clark a corresponding delay is complained of. The fact that the train started from San Antonio on the 20th of last month, has not yet arrived here will give you an idea of the slow and shiftless manner, in which these trains are conducted, especially is this so, when it is well known the train is not within 50 miles of this place.¹

More than a decade later supply officers serving elsewhere in the Southwest would voice similar complaints, for freighters in both decades struggled with the same problems: long distances, primitive roads, uncertain weather, and the threat of Indian attacks. Captain Frederick F. Whitehead, chief commissary of subsistence for the District of New Mexico, wrote on 26 July 1879:

As in years past the contract transportation in this District, during the fiscal year ending June 30, 1879, has uniformly [*sic*] failed to come up to the requirements of the contracts. . . . During the past year several posts in this District ran short in subsis-

tence supplies owing to *unusual* delays in transportation. On one occasion a six months supply of many articles of subsistence stores arrived at Fort Bayard, N.M., one hundred and thirty-six days behind time; on another occasion bacon arrived at Fort Bliss, Texas 87 days overdue.²

Some officers wanted the army to operate its own transportation. None spoke more compellingly than Colonel Joseph A. Potter, quartermaster at Fort Leavenworth, who on 15 September 1865 wrote to Quartermaster General Montgomery C. Meigs that "the system of contracting freight is erroneous. . . . The delays, damages, etc. arising from the careless mode of shipment and want of proper care, will be in a great measure avoided by using nothing but government trains."³ But despite delays and inconveniences, the quartermaster's department had decided long before the Civil War that it was cheaper to hire civilian transportation than to run government wagon trains.⁴

Even so, the army provided some of its own transportation, maintaining teams and wagons for hauling water, hay, fuel, and other supplies and to accompany troops on campaign. A supply depot like Fort Union, New Mexico, was well equipped with wagons and mules. In 1867 the depot had about 250 six-mule teams that were used to supplement contractors' trains in moving supplies within the district. Five years later the depot reported having only 130 wagons and 310 mules, reflecting the army's increased reliance upon contract transportation and its determination to reduce transportation expenses.⁵

Reducing transportation costs was the goal of every supply officer, for the expense of transporting supplies to western garrisons often increased the original purchase price five- or sixfold. Cheap transportation would have to await the coming of railroads, but some reductions were possible by changing routes and modes of supply. Because posts in Arizona were among the most expensive in the Southwest, the army was eager to discover shorter and safer routes for provisioning them. Before the Civil War there were only four military posts in Arizona. Fort Defiance in Navajo country, Fort Breckinridge on the San Pedro River, and Fort Buchanan on the Sonoita received supplies from New Mexico, and Fort Mojave on the Colorado River obtained its supplies from California via ocean and river transportation.⁶ As noted in Chap-

ter 1, a new sea and land route opened to southern Arizona in 1861 via the Mexican port of Guaymas. During and after the war this route figured prominently in the army's efforts to reduce the cost of maintaining the ten or more posts that eventually guarded the Arizona countryside.

Shortly after the California Column occupied Tucson in the summer of 1862, General James H. Carleton dispatched Major David Fergusson on a reconnaissance of Sonora. Fergusson's reports of that trip convinced Carleton that the best route for supplying both Arizona and southern New Mexico was through Mexico. Fergusson had learned that a good road connected Guaymas and Tucson, a distance of 350 miles, with an abundance of wood, grass, and water for almost half the route. Two Mexican citizens had offered to transport military supplies from Guaymas to Tucson at rates advantageous to the army.⁷

Fergusson pointed out in a letter to California headquarters that it cost about 3½ cents per pound to ship stores from San Francisco via the Colorado River to Fort Yuma (established in 1850 on the California side of the river) and an additional 12½ cents per pound to haul supplies overland from Yuma by government trains to Tucson, a distance of about 275 miles. Fergusson believed that it would cost only 6 cents per pound to transport supplies from San Francisco to Tucson via Guaymas. Further reductions would be made by freighting from Lobos or Libertad, Mexican ports north of Guaymas and about 213 and 225 miles respectively from Tucson.⁸ On a second reconnaissance carried out in October, Fergusson found the roads to Lobos and Libertad to be in good condition; he later claimed that "with the exception of San Diego and San Francisco, California has no harbor comparable to La Libertad."⁹ Thereafter Carleton posted letters to government officials, including one dated 8 March 1863 to Secretary of State William H. Seward, urging the United States to purchase a strip of Sonora that would include Lobos and Libertad and a land route to Tucson. Not only would this allow the army to cut its transportation expenses, but it also would provide New Mexico and Arizona with outlets for shipping their valuable ores. Fergusson echoed Carleton's recommendations utilizing words reminiscent of an earlier period of Manifest Destiny: "The Almighty intended that Sonora and Arizona should be *one*, and made the Port of Libertad as a bond of Union." Two and one-half

years later, in December 1865, Governor Richard C. McCormick of Arizona called upon the United States to annex part of Sonora to ensure the economic development of his territory.¹⁰

But Carleton's initial attempts to move military supplies through Mexico met with failure. Even though Governor Ignacio Pesqueira of Sonora seemed willing to allow transit through his state, supplies for Tucson and southern Arizona were shipped via the Colorado River and then transported overland from Fort Yuma. It was not until the summer of 1864 that the army utilized the Guaymas route. In May of that year the U.S. brig *General Jesup* left San Francisco for Guaymas loaded with commissary stores for Arizona. Tucson residents Joseph S. Rogers and George W. Pierce contracted to haul the supplies overland to Tucson for 6½ cents per pound of freight.¹¹ Delayed en route by heavy rains, the contractors' trains did not reach their destination until 26 July. A board of officers examined the supplies as they were unloaded in Tucson—hundreds of sacks, barrels, and boxes filled with flour, beans, rice, coffee, salt, pork, ham, sugar, vinegar, whiskey, candles, soap, hard bread, mixed vegetables, syrup, and pepper. Captain William French, who had examined several previous shipments sent via Fort Yuma, claimed never to have seen supplies "that arrived with so little loss or damage, or that could compare in good order with these just received via Guaymas."¹²

Because of the unsettled conditions in Mexico, the army temporarily abandoned the Guaymas route in 1865. French troops overran much of Sonora that year, forcing Governor Pesqueira and his wife to flee to Arizona. Even though the French commander authorized passage of U.S. military supplies, U.S. officials decided not to risk shipping goods through a wartorn country.¹³

When it appeared that Mexican troops would regain control of Sonora the following year, army officers in Arizona mounted a campaign to reestablish the Mexican supply route. Captain Gilbert C. Smith, in charge of the depot at Tucson, pointed out to Quartermaster General Meigs that the total cost of shipping goods from San Francisco via Guaymas in 1864 had amounted to 7¼ cents per pound in coin and that freight shipped via Fort Yuma since then had cost at least 12 cents per pound in coin. Goods were in transit forty-five to sixty-five days via Fort Yuma, but would arrive at Tucson in twenty-

five to thirty days via Libertad. A short time later, Lieutenant Colonel Henry D. Wallen, commanding at Tucson, wrote to Senator Cornelius Cole of California explaining the economic advantages of the Libertad route and requesting that Cole use his influence in Washington to authorize an experimental shipment of stores from San Francisco to Libertad.¹⁴

Even though General Henry W. Halleck, commanding the Military Division of the Pacific, warned against sending supplies through turbulent Mexico, the quartermaster's department contracted with Phineas Banning in April 1867 to deliver government supplies in Tucson via Guaymas at a price of 7 cents per pound for the entire distance from San Francisco.¹⁵ Subsequent events justified Halleck's unease. The collector of customs at Guaymas demanded payment of duties on Banning's cargo, ignoring Governor Pesqueira's orders granting duty-free transit on U.S. army supplies. Mexican officials later said that the customs agent had misinterpreted his instructions. Nonetheless, supplies were detained at Guaymas at least a month or two and did not reach Tucson until December. In light of this trouble, it is not surprising that no one bid on the Guaymas route in 1868 and that supplies consequently were sent to southern Arizona via Fort Yuma.¹⁶

But the army never lost interest in the cheaper transportation route through Sonora. On 18 March 1868 Captain Charles A. Whittier left Wilmington, California, and traveled overland on an inspection tour of Arizona posts, with special instructions to investigate the cost of moving supplies through Sonora. His report, dated 9 June and written on board the steamship *Montana* en route from Guaymas to San Francisco, gives a detailed picture of the resources of Sonora. Whittier described the road from Tucson to Guaymas as "one of the very best possible" and depicted Guaymas as "a lively little commercial town, with one of the best harbors upon the Pacific." Whittier had located residents in Guaymas and in Hermosillo, the largest town in Sonora, who would transport government freight from Guaymas to Tucson at 4 cents per pound. The captain estimated that the total cost of transporting supplies from San Francisco to Tucson via Guaymas would not exceed \$100 per ton (5 cents per pound), which compared favorably with the \$175 per ton (8¾ cents per pound) it then cost to send supplies via the Fort Yuma route. He also noted that Mexican teams car-

ried freight more cheaply than teams in the United States because Mexican owners fed their mules no grain and paid their teamsters much less than teamsters were paid across the border.¹⁷

Whittier was convinced that the Sonora route was superior to the Yuma route, and—like Carleton—he advocated attaching Sonora to the United States. He claimed there was “scarcely a man of property in [Sonora], be he Mexican, English, French or American who would not hail with joy the cession of the state.” Men of means wanted law and order, which the Mexican government had failed to provide. He concluded his lengthy report with these words: “May it not be long before the expectations of its best people shall be realized and Sonora with its bright promises, be joined to our Republic—preserving itself and adding to our wealth and influence.”¹⁸

In August 1869 the quartermaster's department contracted with Charles E. Mowry to transport government stores to Tucson by way of Guaymas for 5.44 cents per pound for the entire 2,130 miles from San Francisco. Mowry employed a train of 200 wagons for the Tucson–Guaymas road, and in late December and early January 1870 detachments of 10 and 12 wagons loaded with government supplies began arriving in Tucson.¹⁹

Despite the fact that moving supplies through Sonora saved the army both time and money, the government decided to abandon the Guaymas route in 1870. For the fiscal year ending 30 June 1871, the quartermaster's department contracted with Hooper, Whiting, and Company to transport freight from San Francisco to Tucson via Yuma for 8 $\frac{3}{8}$ cents per pound for the entire distance of 2,475 miles.²⁰ A number of factors entered into this decision: political instability in Mexico, bureaucratic red tape, threat of Indian and Mexican bandit attacks, and political pressure from California and Arizona politicians who claimed that “it was to the advantage of the public service” to move government freight through U.S. territory.²¹ The editor of the *Weekly Arizonan* had called Mowry's 1869 contract a calamity, for it denied Arizona residents lucrative employment in transporting goods over American soil. Many people in Arizona shared his belief that freighting government supplies over roads within the territory added to the security of those roads and thus encouraged settlement.²² Sylvester Mowry, brother of Charles Mowry, vigorously protested the change, however. Owner of a valuable silver mine south of Tucson,

Mowry was embittered by the loss of Guaymas as an outlet for his ores. In a letter published in the *Alta California*, he accused Hooper, Whiting, and Company of taking the contract at a ruinously low price simply to destroy the Guaymas route.²³

A short time later, after Colonel George Stoneman, commanding the Department of Arizona, recommended the removal of the military depot from Tucson and the abandonment of several military posts in southern Arizona, the *Tucson Weekly Arizonan* reversed its stand on the Guaymas route. In a lengthy article appearing 28 January 1871, the press acknowledged that heretofore residents in southern Arizona had been economically dependent upon transactions with the quartermaster's department. With removal of army posts Arizonans would have to take up new enterprises and adopt "the cheapest route by which freight may be brought into the Territory." Clearly the freight route by way of the Colorado River and Fort Yuma had to be abandoned because it was twice as expensive as the Guaymas route. "While government supplies were imported by that route [Colorado River]," the press maintained, "the interests of the settlers along the Gila were a sufficient argument for its continuance." Now economic progress demanded adoption of the Guaymas route. About three months later the press was castigating the army for having abandoned the Guaymas route in the first place!²⁴

The Guaymas route never again figured prominently in the transportation of government supplies. The Tucson press occasionally mentioned freighters arriving from Guaymas with goods for the government. But until the Southern Pacific Railroad entered the territory in 1878, supplies for military posts in southern Arizona were usually hauled overland from Yuma.

The main supply route for Arizona long remained a land and water route from San Francisco via the Gulf of California. During the 1860s privately owned sailing vessels carried goods from San Francisco around Lower California and up the Gulf to the mouth of the Colorado River, a distance of about 2,000 miles. There stores were reshipped on small steamers that ascended the river to Fort Yuma, about 150 miles upstream, and to Fort Mojave, about 300 miles beyond Yuma. Shipping rates proved fairly stiff. By mid-decade, the army paid about \$15 per ton for goods carried from San Francisco to the mouth of the Colorado River and \$40 per ton from the mouth of the river to Fort Yuma. Up

to 1864, George A. Johnson and Company held a monopoly of river transportation, operating three steamers—the *Cocopah*, the *Colorado*, and the *Mohave*. But the company failed to keep pace with expansion of trade, leaving freight piled up at the mouth of the river and at Arizona City (across from Fort Yuma) before shipment to the interior. Impatience and dissatisfaction on the part of upriver merchants led to the appearance of a rival company on the river in 1864, which in turn led to a reduction in rates. In 1867 the government paid \$20 per ton from the mouth of the river to Fort Yuma and \$37.50 per ton from Yuma to Mojave. This was one half the former rate and about one half less than the rate charged to civilians.²⁵

Johnson regained a monopoly of river transportation in the fall of 1867 when the rival company went out of business. But the lower rates and improved service continued. By 20 December 1869, when Johnson and partners Benjamin M. Hartshorne and Alfred H. Wilcox incorporated as the Colorado Steam Navigation Company, the firm was running four river steamers and a half dozen barges, which were used to tow additional freight behind the steamers. In 1871 the company purchased an ocean-going steamer, the *Newbern*, and soon provided direct service from San Francisco to the mouth of the Colorado River. The following year the company signed a twelve-month contract to transport army supplies from San Francisco to the Colorado River at a rate of \$14 per ton, agreeing to make the voyage in ten days by steamer or twenty-four days by sailing vessel. The company purchased a second ocean-going steamer, the *Montana*, in 1873 and reduced the army's shipping rates to \$12.50 per ton.²⁶

Colonel Delos B. Sacket, who traveled on the *Newbern* en route to Arizona in the spring of 1873, described the ship as being "comfortably arranged for carrying troops and passengers." Cabin passage from San Francisco to the mouth of the Colorado River was \$75; deck passage (price per enlisted man) was \$40.²⁷ Martha Summerhayes later penned a classic description of her "never-to-be-forgotten voyage" down the Pacific Coast and up the Gulf of California. She made the trip in August 1874 on board the *Newbern* with her husband and other members of the 8th Infantry en route to new assignments in Arizona. She recalled that the weather was so "insufferably hot" steaming up the Gulf that at night officers and their wives abandoned staterooms to sleep on deck. Odors from rotting provisions permeated the ship,

clinging to food placed on the mess table. After a voyage of thirteen days the *Newbern* reached the mouth of the Colorado River. Three days elapsed before the sea was calm enough to transfer troops and baggage to a smaller steamer. Further delays added to their suffering. At least three enlisted men died before the regiment reached Fort Yuma. Summerhayes later recalled her joy upon reaching their destination: "After twenty-three days of heat and glare, and scorching winds, and stale food, Fort Yuma and Mr. Haskell's dining-room seemed like Paradise."²⁸

During months of high water, between 1 May and 1 October, steamers made the trip between the mouth of the Colorado River and Fort Yuma in two or three days. For the remainder of the year travel was difficult, and steamers sometimes took ten days to reach Fort Yuma.²⁹ It was even more difficult to reach Fort Mojave in low water. The commanding officer at Mojave complained in late November 1863 that a steamer carrying badly needed supplies had not yet arrived after being more than twenty days out from Yuma. Thereafter, during the winter and following spring, the garrison was dependent for supplies on overland transportation from San Pedro, California.³⁰

One of the best-known entrepreneurs on the Colorado River was Pennsylvania-born Louis J. F. Jaeger. He and several partners established a ferry at the junction of the Gila and Colorado rivers a few months before Fort Yuma was established there in 1850. Jaeger soon bought out his partners and then engaged in a number of enterprises that made him a wealthy man. He hauled supplies for the army, raised cattle, horses, and sheep, operated a mercantile store, and invested in mines. At the start of the Civil War army authorities feared that Confederates might overrun the crossing, and consequently destroyed one of Jaeger's boats anchored twenty miles upriver and moved the others "up to and under the guns of Fort Yuma." The California Column en route to New Mexico crossed the river in Jaeger's boats.³¹

In 1865 the army decided it would be more economical to run its own ferry. Consequently a boat was made in San Francisco, shipped in pieces to Yuma, and there reassembled. It operated only a short time, however, for in March 1866 the ferry was sold to Jaeger at the original cost to the government of \$4,587. Jaeger also agreed to ferry army supplies and personnel at one half his charter rates. By this date new military storehouses had almost been completed across the river from Fort

Yuma—site of the Fort Yuma Depot. Since all supplies for southern Arizona would thereafter be delivered at the storehouses, army authorities anticipated a reduction in the amount of ferriage. To their dismay, however, government use of the ferry increased. Ferry bills became “so extravagantly large” that restrictions were imposed on the use of Jaeger’s ferry. A small rowboat manned by two soldiers on extra-duty was used exclusively for crossing personnel, the “ferryboat being resorted to only for wagons and animals.” Still, in some months the army’s ferriage bill exceeded \$275.³² In October 1867 the army arranged a new contract with Jaeger, setting rates at \$200 a month in coin. Two years later rates were increased to \$250 a month.³³ Jaeger’s ferry business ended when the Southern Pacific Railroad completed a bridge over the river in 1877.

The government contracted with private firms to freight supplies overland from the Colorado River to interior posts. Supplies destined for Fort Whipple initially landed at La Paz, a mining supply point 150 miles upstream from Fort Yuma, and from there were transported overland about 190 miles to the post. Water was scarce along the overland route. One freighter confided to Army Inspector Nelson H. Davis that he would rather haul freight to Fort Whipple from Leavenworth, Kansas, than from La Paz.³⁴ A second route opened in 1865 when William H. Hardy built a toll road connecting Prescott with Hardyville, nine miles above Fort Mojave. Competition soon became intense among backers of the two roads. Hardy won a government contract in 1866 to transport supplies from Hardyville to Fort Whipple, a distance of about 160 miles, at 8½ cents per pound of freight. In February of the following year Bernard Cohn agreed to transport 100 tons of government stores to Fort Whipple from La Paz at 8 cents per pound.³⁵

Local entrepreneurs and freighters constantly looked for shorter and better routes to attract new customers. Ehrenberg, for example, located in 1867 seven miles below La Paz, replaced the latter town as the main shipping point to mines and posts in central Arizona after the river changed course leaving La Paz without good frontage.³⁶ But rains turned all these routes into quagmires and slowed movement of supplies. Because of muddy roads in February of 1868 wagon trains on the La Paz road took thirty days to reach Prescott, almost twice as long as it usually took. Later that summer government freight en route to Prescott was left on the desert because of impassable roads. Delays

such as these caused critical shortages at the interior posts. On several occasions troops at Camp Lincoln had been "reduced to their last sack of flour," and on one occasion the commissary officer at Fort Whipple had had to borrow coffee from local merchants to send with scouting parties.³⁷

The contractor struggling to provision these posts was Virginia-born Dr. Wilson W. Jones, one of the largest freighters on the La Paz-Prescott route. Exactly when Jones arrived in Arizona is not known, but by 1860 he had established a mercantile store at the site of the new gold strikes on the Gila River about fifteen miles east of Fort Yuma. Sometime later in the decade he became partners with Michael and Joseph Goldwater in a freighting firm operating out of La Paz. Wilson W. Jones and Company won its first government freight contract in May 1867, agreeing to transport army supplies from La Paz to Camp Lincoln, Camp McPherson, and Fort Whipple for 4 cents per pound per hundred miles. The firm received additional contracts for hauling stores to Fort Whipple and nearby posts in each of the following three years.³⁸

Freighting overland from Fort Yuma to Tucson was as arduous as freighting on the La Paz road. Tucson-bound freighters were faced with heavy sand, scarcity of grass and water, and difficulty in obtaining grain for their work animals. One officer claimed that this route was "almost as impassable at many seasons of the year as the desert of Sahara."³⁹ General John S. Mason believed that freight contractor Phineas Banning had made no money on his 1865 contract, which called for transporting supplies from Yuma to Tucson for 3 cents per pound per hundred miles. The following year Banning received the contract at 6 cents per pound per hundred miles, a price Mason felt was too high but as cheap as could be done with government trains.⁴⁰ In good weather freighters usually made the round trip between Tucson and Yuma in thirty days. But delays often occurred. Drenching rains in early 1874 made roads out of Yuma almost impassable for heavy wagons. One wagon train traveled only five miles in six days and after twenty-three days on the road finally reached Fillibuster Station, just thirty-eight miles east of Yuma.⁴¹

One of the most successful freighting firms operating out of Tucson belonged to Pinckney R. Tully and Estévan Ochoa. Ochoa had learned the freighting business as a boy when he accompanied his brother's

freight train from Chihuahua to Independence, Missouri. His partner Tully had been freighting on the Santa Fe Trail since 1846. Probably the first government freight contract the firm received in Arizona was the one Ochoa signed on 21 December 1863 agreeing to transport military stores from Fort Yuma to Tucson during the coming year. The contract required him to keep in running order thirty good teams and wagons, with an average freighting capacity of not less than 3,500 pounds each. Ochoa would receive 10 cents per pound of freight transported on the first trip to Tucson, 9 cents per pound for the second trip, and 8 cents per pound for the third and all subsequent trips before 1 January 1865. Ochoa would also have the privilege of purchasing grain forage at cost from government depots at either Tucson or the Pima villages.⁴²

Probably the next freight contract the firm received was one awarded on 1 June 1868 to transport army supplies from Tucson to posts in southern Arizona for 2.47 cents per pound per hundred miles. Indians made two attacks on the firm's wagon trains while the contract was in force. On 13 July 1868 100 Indians attacked their wagons at Cienega, about twenty miles southeast of Tucson, killing 2 men, wounding 4, and capturing 38 mules. Ten months later a party of 200 Apaches attacked their train carrying government supplies to Camp Grant, killing 3 men, wounding 2, destroying 2 wagons, and capturing 80 mules. The firm's losses in the second attack amounted to about \$12,000. In December of 1870 another train of Tully and Ochoa, en route to Camp Goodwin, lost 30 oxen during an Indian attack. At this time the firm was under contract to freight army supplies from Tucson to Camps Crittenden, Bowie, Goodwin, and Grant for 2.39 cents per pound per hundred miles.⁴³ Despite reversals such as these the firm earned a reputation for honesty and integrity. One officer described Ochoa as a man who "always fills his contracts to the letter, even if he loses by it." Tully and Ochoa won at least three more government freight contracts before the Southern Pacific Railroad brought a halt to their freighting business.⁴⁴

Contractors like Tully and Ochoa found Camp McDowell among the most difficult posts to supply, and their fees often reflected this fact. The firm of Fish and Hellings, for example, in 1873 charged twelve cents more per hundred miles for transporting a hundred pounds of freight 222 miles to McDowell than for hauling supplies 275 miles

to Tucson. Wagon trains had to cross both the Gila and Salt rivers en route to McDowell, and during the rainy season the rivers were not fordable. Even with ferries at both crossings it was no small task getting provisions to the garrison. A troubled Major Andrew J. Alexander, commanding officer at McDowell, wrote to his superiors on 18 August 1868: "I desire to call attention to the isolated condition of this post during the rainy season. For nearly a month now, the Salt river has been impassable to a wagon, and all the supplies of flour and grain we have received have been ferried across in a ricketty [sic] skiff." Alexander later reported that the most favorable months for supplying the post were January, May, June, September, and October, with trains usually en route sixteen to eighteen days from Yuma.⁴⁵

Arizona historian Henry P. Walker has observed that "freighting was a relatively easy business to get into. All one needed was enough money to buy a wagon and a team of mules or oxen, say \$1,000."⁴⁶ Luckily for the government, many Arizonans invested money in wagon freighting. As competition increased, freighting rates declined. A dramatic fall in rates occurred at Camp McDowell. In 1866 Louis J. F. Jaeger had hauled freight between Fort Yuma and McDowell for 6 cents per pound per hundred miles; a decade later Estévan Ochoa agreed to do the same for 1.73 cents.⁴⁷

In the fierce competition to obtain government contracts, firms sometimes employed questionable tactics, a fact well illustrated in the letting of the 1871-72 contracts. This was a hotly contested race in which eleven firms or individuals submitted bids. When they were opened on 15 May 1871, it appeared that David Neahr had submitted the lowest bid for transporting supplies from Yuma to posts in southern Arizona and that James M. Barney had handed in the lowest bid for freighting over the Ehrenberg-Prescott route. Barney was a member of the prestigious mercantile firm of Hooper, Whiting and Company, whose main store at Arizona City functioned as a forwarding and commission house. This firm wanted to monopolize government freighting and sought to have Neahr's bid thrown out as a "bogus bid." Neahr, former chief engineer of George A. Johnson and Company, operated a competing commission house in Arizona City. The Hooper firm enlisted the aid of California Senator Cole, who filed papers on their behalf with the government. The company probably also solicited help from the former superintendent of Indian affairs for Arizona, Colonel

George L. Andrews, who soon advised Secretary of War William W. Belknap that Neahr was unreliable, having failed to give bonds and enter into a contract with the Indian Bureau. Quartermaster General Meigs received reports that Neahr's bid for army transportation was "made for the purpose of blackmailing or being bought off; that his guarantors repudiate his use of their names." Meigs preferred awarding the contract to Barney, who represented "a well known firm of good standing." On 14 June 1871 Secretary Belknap issued his decision: "Contract to be made with Barney at the rates of his bid, *provided* the allegations made against Neahr, and his bid are found, on investigation, to be true."⁴⁸ The case then was referred to General John M. Schofield, commanding the Military Division of the Pacific, who on 26 July ruled as follows: "The allegations against David Neahr and his bid not having been found on investigation to be true the contract for land transportation in Arizona will be made with him for the posts named in his bid, and with Barney for other posts."⁴⁹

But the controversy was not over. On 30 September Michael Goldwater claimed in a letter to the War Department that he had submitted the lowest bid and deserved the contract. He alleged that Barney's contract had been awarded through political influence. On first glance, Goldwater's bid appears lower than Barney's. Goldwater offered to transport supplies from Fort Yuma to Camps Hualpai, Date Creek, Verde, and Fort Whipple for 2 cents per pound per hundred miles, whereas Barney's bid for transporting supplies to the same posts from Ehrenberg was 2.75 to 2.85 cents per pound per hundred miles. Goldwater apparently planned to move supplies via the Colorado River to Mojave and then freight them overland. Meigs pointed out that the government already had arranged with the steamboat company to move supplies upriver at lower rates. Meigs or one of his officers further noted that Goldwater's bid was not low "when it is considered that transportation by water from Yuma to nearest points on river costs but about 50 cents per 100 pounds per 100 miles." Goldwater had submitted a second bid to carry freight overland from Ehrenberg for 3.20 cents per pound per hundred miles, clearly higher than Barney's bid. In late October Secretary Belknap informed Goldwater that he had "no just ground for complaint."⁵⁰

David Neahr had almost as many problems completing his contract as he had in winning it. Within a few months of signing the contract,

his wagon trains had been idled for lack of military escorts, supplies damaged or stolen in transit, and his teams diverted to military sites not covered in the contract. By May 1872 Neahr was even having difficulty securing teams, for the army was moving a large amount of barley from Tucson to Prescott and freighters preferred hauling on that route where the road was better and grass more plentiful. Whether Neahr made any profit on the contract is not known. The chief quartermaster for the Department of Arizona, Major James J. Dana, remarked that Neahr's price of 2 cents per hundred miles "is as low a rate as has usually been obtained in this Department."⁵¹

Neahr was not the only freighter having problems that year. Because of heavy demands placed on freight contractors, General George Crook reported in September that during the past year contractors had "in some instances failed, or moved so slowly as to render it almost as embarrassing as complete failure." Crook was not unsympathetic to the freighters. Ox and mule transportation was always slow, he wrote, but transportation problems were compounded in Arizona where Indians preyed on the unwary, grass and water were scarce, much of the land a desert, and where the "rays of a burning sun fall with uninterrupted fierceness for months." Crook's successful winter campaign later that year permitted wagon trains to travel in greater safety. As a result Crook would observe in his 1873 annual report that delays in transporting supplies by contract had been greatly reduced.⁵²

James M. Barney was among the freighters who profited from the newly established peace. One of Arizona's most successful entrepreneurs, Barney is yet another example of the transplanted easterner whose sky-rocketing business career had its foundation in the military market. The 27-year-old native of New York had arrived at Fort Yuma in 1865 and soon contracted with the army (in partnership with Louis J. F. Jaeger) to transport supplies to Tubac. Thereafter he worked as a civilian employee in the quartermaster's department at Yuma until 1867, when he resigned and bought an interest in George F. Hooper and Company, the predecessor of Hooper, Whiting and Company. The firm dealt heavily in government contracts. In his own name, Barney received the 1872-73 contract for transporting supplies from Yuma Depot to the southern posts, and in June 1874 he contracted to transport company property and baggage of the 8th Infantry moving into Arizona from the Pacific Coast via the Colorado River. In Sep-

tember 1875 he became sole owner of the Hooper firm. When not overseeing government freight contracts and his growing mercantile business, Barney invested in mining properties and soon became principal owner of the famous Silver King Mine. About 1881 Barney turned his full attention to developing the mine and began to close out his other business enterprises.⁵³

Barney and other freighters in Arizona charged their highest rates for transporting government supplies to Camp Apache, established in 1870 a few miles north of the Salt River and about 490 miles from the Yuma Depot. The road leading north from the Gila River was wretched. Colonel August Kautz observed after an inspection tour in 1875 that Apache was "almost inaccessible from the West and South by wagon transportation."⁵⁴ Consequently the army looked to the east for a safer and more economical supply route through New Mexico, a route made possible by the advance of railroads.

In June 1872 the Denver and Rio Grande Railroad reached Pueblo, Colorado, linking that city with the east via the Kansas Pacific Railroad, which had reached Denver two years earlier. Data from the quartermaster general's office indicated that goods shipped to Apache from Leavenworth via Pueblo would cost \$9.52 per hundred pounds and from San Francisco via Yuma, \$11.44 per hundred pounds.⁵⁵ On 10 May 1873 the quartermaster's department awarded Henry C. Lovell of Topeka, Kansas, the government freight contractor for posts in Kansas, Colorado, and New Mexico, the first contract for transporting stores to Camp Apache from the east. For freighting between Pueblo and Camp Apache, a distance of more than 600 miles, Lovell would receive between 85 cents and \$1.10 per hundred pounds per hundred miles, depending on the season of the year. The new route was an immediate success. Writing from Camp Apache on 30 June Army Inspector Delos B. Sacket reported that freight had arrived from Pueblo "in most excellent condition"—not badly broken up and damaged as frequently happened on the route from Yuma Depot. He had learned that the roads through New Mexico were "very good," and he suggested that Camps Bowie and Grant be supplied from the east as well.⁵⁶

For the next several years government stores for Camp Apache were transported from eastern military depots by rail to Colorado and then hauled overland through New Mexico by contract transportation. At

the same time Arizona contractors continued to receive contracts for hauling freight between Yuma and Apache. During the 1876-77 fiscal year posts in southern Arizona also received subsistence stores from the East—by railroad to El Moro, Colorado (terminus for the Denver and Rio Grande) and then by wagon to Camp Apache, whence they were sent south. Even though military officials in California argued against this route for supplying posts other than Apache, supplies continued to be funneled through New Mexico—but not without mishap.⁵⁷ According to Captain Charles P. Eagan, chief commissary officer in Arizona, the transportation system through New Mexico broke down in 1878. A contract issued in February of that year called for freighter F. F. Struby to move supplies from Fort Garland, Colorado (near the terminus of the western branch of the Denver and Rio Grande), to Camp Apache and posts in southern Arizona. In August Eagan would complain:

Subsistence stores for Apache are now over four months en route from Chicago and have not yet arrived, and the stores invoiced from Chicago to Bowie, Grant, Lowell and Thomas on March 29th have not arrived and nothing is known of their whereabouts except those for Bowie. It appears that Bowie stores were forty six days from Garland to Santa Fe, showing the ox teams traveled less than 3½ miles per day. At this rate, having passed Santa Fe July 18th they will reach Bowie about the 18th of next November.⁵⁸

Because of these and other delays, the subsistence department temporarily abandoned the New Mexico route and in the fall ordered all stores for posts in Arizona from San Francisco. By late 1879, however, the army was shipping Arizona-bound stores to New Mexico over the Atchison, Topeka and Santa Fe Railroad, which had reached Las Vegas, New Mexico, in July. From Las Vegas supplies for Forts Apache, Bowie, Grant, and Thomas were hauled overland by contract transportation.⁵⁹

Changes in supply routes came rapidly as railroads extended their tracks across New Mexico and Arizona. The Southern Pacific Railroad reached Tucson in March 1880 and crossed the border into New Mexico in September. Only a few weeks earlier, on 30 August, Eagan reported that all posts in Arizona, except Fort Apache, were receiving subsistence stores from San Francisco via the Southern Pacific and

then by wagon (in the case of Mojave by steamboat). Almost without exception, stores from San Francisco were being delivered on time and in excellent condition. But transporting supplies to Apache from Las Vegas was, in Eagan's eyes, a complete failure. The commissary officer at Apache attributed the problem to bad roads, describing the 100-mile stretch approaching the post as little better than a well-defined mountain trail. He claimed the road was "almost impassable for wheeled vehicles from about November 1st to March 1st." During the spring one freighter had abandoned his cargo about 70 miles before reaching Apache.⁶⁰

The Southern Pacific connected with the Atchison, Topeka and Santa Fe at Deming, New Mexico, in March 1881, forging a link between California and the Midwest. About the same time the Atlantic and Pacific Railroad, now incorporated in the AT&SF Company, was building west from Albuquerque. By late 1881 it had reached Winslow, Arizona, and then continued along the thirty-fifth parallel reaching the Colorado River opposite Needles, California, in August 1883. A bridge over the river allowed the Atlantic and Pacific to connect with a branch of the Southern Pacific, providing access to Los Angeles and San Francisco. Extension of these lines allowed posts in Arizona to be supplied partly from San Francisco and partly from Chicago, according to local prices and the cost of transportation.⁶¹

With the building of steel rails across Arizona, local farmers would face stiff competition from California producers. Lieutenant William W. Wotherspoon, acting chief quartermaster for the Department of Arizona, reported that during the fiscal year ending 30 June 1881, Forts Bowie, Grant, Huachuca, and Lowell were supplied with grain, hay, and straw from southern California. Since contract registers indicate that only Arizona residents contracted to supply these posts with grain that year, they must have imported at least part of their supplies from California. During the next fiscal year Walter S. Maxwell and Thomas W. Stackpole, residents of Los Angeles, California, contracted for grain and hay destined for southern Arizona posts. In following years increasingly larger amounts of forage entered the territory from California in railroad cars.⁶²

Even with the coming of railroads, territorial freighters were needed to haul supplies between railroad stations and the garrisons. For the fiscal year ending 30 June 1884, for example, Adolph Solomon of Sol-

omonville, Arizona, received contracts to haul army freight from Bowie Station on the Southern Pacific Railroad to Forts Bowie, Grant, Thomas, and to San Carlos. For the fourteen-mile trip between the railroad station and Fort Bowie, Solomon would receive 28 cents per hundred pounds. For the 101-mile haul to San Carlos, the contractor would receive about \$1.21 per hundred pounds for the whole distance. Two Arizona contractors were awarded contracts for hauling freight to the northern posts. William S. Head of Fort Verde would haul supplies from Maricopa, a station on the Southern Pacific, to Forts McDowell, Whipple, and Verde. Samuel C. Miller, a pioneer Prescott freighter, would transport supplies from Ash Fork, a station on the Atlantic and Pacific, to Forts Whipple, Verde, McDowell, and Apache. For the 90-mile trip to Apache, Miller would receive \$1.80 per hundred pounds; for the 81-mile trip to Fort Verde, \$1.60 per hundred pounds; and for the 56-mile trip to Whipple, \$1.12 per hundred pounds. Most supplies destined for Whipple and Verde were shipped the shorter route via Ash Fork rather than through Maricopa.⁶³

Without doubt railroads greatly benefited the army in Arizona. Military personnel and supplies were transported quickly and cheaply, though some delays in moving freight still were inevitable. Subsistence stores arrived fresher and with less damage and deterioration than before. The large and expensive installation at Yuma Depot would be dismantled, for with railroad transportation its role as a forwarding station had ended. Railroads also encouraged economic development in Arizona, primarily in mining and ranching. But railroads brought reversals to old established mercantile companies like William Zeckendorf, Lord and Williams, and Tully, Ochoa, and Company. These firms were forced to sell goods at a loss to compete with cheaper goods brought in by rail, and they did not survive the competition. Tully and Ochoa closed their doors after selling \$100,000 worth of freighting equipment at a loss. The long-distance freighting industry, indeed, went into decline once the Southern Pacific Railroad was built across Arizona. It is an ironic fact that when the first train pulled into Tucson, Estévan Ochoa presented a silver spike to Charles Crocker, the company's president.⁶⁴ And even though the army initially encouraged local production of forage and foodstuffs, with the coming of railroads millers and farmers found dwindling markets at military posts.

Appendix 12

Contracts for wagon transportation in Arizona—Route 1

Fiscal year	Firm	From	To	Miles ^a	Rate per pound per 100 miles (in cents)
1871-72	David Neahr	Yuma Depot	Tucson	275	2
			Grant	268	2
			Crittenden	326	2
			McDowell	222	2
			Bowie	380	2
			Pinal	390	2
			Apache	491	2
1872-73	James M. Barney	Yuma Depot	Tucson	—	2.30
			Grant	—	2.60
			McDowell	—	2.43
			Bowie	—	2 $\frac{3}{8}$
1873-74	E. N. Fish & W. B. Hellings	Yuma Depot	Tucson	275	2.25
			Grant	388	2.25
			McDowell	222	2.37
			Bowie	380	2.29
			Apache	491	3.25
1874-75	Estévan Ochoa	Yuma Depot	Lowell	275	1.85
			Grant	388	1.85
			McDowell	222	1.85
			Bowie	380	1.85
			Apache	491	2.87
1875-76	Mariano G. Samaniego	Yuma Depot	Lowell	222	1.47
			Grant	391	1.47

<i>Fiscal year</i>	<i>Firm</i>	<i>From</i>	<i>To</i>	<i>Miles^a</i>	<i>Rate per pound per 100 miles (in cents)</i>
			McDowell	281	1.69
			Bowie	380	1.47
			Apache	491	2.43
			San Carlos	471	1.47
1876-77	Estévan Ochoa	Yuma	Lowell	222	1.73
		Depot	Grant	391	1.73
			McDowell	281	1.73
			Bowie	380	1.73
			Apache	491	2.45
			San Carlos	471	1.73
1877-78	James M. Barney ^b	Yuma	Lowell	—	4.91 ^c
		Depot	Grant	—	6.79 ^c
			McDowell	—	3.93 ^c
			Bowie	—	6.65 ^c
			Apache	—	9.52 ^c
			Thomas	—	7.52 ^c
1878-79	James M. Barney	Yuma	Lowell	—	1.60
		Depot	Grant	—	1.60
			McDowell	—	2
			Bowie	—	1.60
			Apache	—	2
			Thomas	—	1.60
			Huachuca	—	1.60
1879-80	Edward Hudson	Maricopa	Apache	432	3
			(via Verde)		
			McDowell	51	1.12
		Casa	Lowell	71	1.12
		Grande	Grant	171	1.12
			Bowie	169	1.12
			Apache	290	3
			(via Tucson)		

<i>Fiscal year</i>	<i>Firm</i>	<i>From</i>	<i>To</i>	<i>Miles^a</i>	<i>Rate per pound per 100 miles (in cents)</i>
			Thomas	213	1.12
			Huachuca	137	1.12
			Rucker	189	1.12

Data compiled from records in RG 92, RG 393, and Annual Reports of the Secretary of War.

^aMileage as specified in contracts.

^bBarney's contracts ran from 1 July to 31 December 1877. It is not clear who held transportation contracts for January through June 1878. Barney also contracted to send goods directly from San Francisco to each post.

^cRate per pound per entire distance.

Appendix 13

Contracts for wagon transportation in Arizona—Route 2

<i>Fiscal year</i>	<i>Firm</i>	<i>From</i>	<i>To</i>	<i>Miles^a</i>	<i>Rate per pound per 100 miles (in cents)</i>
1871-72	James M. Barney	Ehrenberg	Whipple	177	2.75
			Verde	216	2.75
			Date Creek	117	2.75
			Hualpai	204	2.85
1872-73	Jonathan M. Bryan & Abraham Frank	Ehrenberg	Whipple	—	2.35
			Verde	—	2.70
			Date Creek	—	2.50
			Hualpai	—	2.50
			McDowell	—	1.90
1873-74	Daniel Hazard	Ehrenberg	Whipple	—	2.49
			Verde	—	2.49
			Date Creek	—	2.35
			Hualpai	—	2.25
			McDowell	—	2.30
1874-75	R. B. Carley	Ehrenberg	Whipple	—	2.05
			Verde	—	2.14
1875-76	Charles W. Beach	Ehrenberg	Whipple	197	1.53
			Verde	243	1.65
			McDowell	214	1.75
			Apache	407	2.48
			Mojave	340	1.50
1876-77	Samuel C. Miller	Ehrenberg	Whipple	197	1.47
			Verde	243	1.49
			McDowell	214	1.63
			Mojave	340	1.49

<i>Fiscal year</i>	<i>Firm</i>	<i>From</i>	<i>To</i>	<i>Miles^a</i>	<i>Rate per pound per 100 miles (in cents)</i>
1877-78	James M. Barney ^b	Ehrenberg	Whipple Verde	— —	3.27 ^c 4.25 ^c
1878-79	James M. Barney	Ehrenberg	Whipple Verde	— —	2.25 2.25
1879-80	Aaron Barnett	Maricopa	Whipple Verde	125 123	1.60 1.60

Data compiled from records in RG 92, RG 393, and Annual Reports of the Secretary of War.

^aMileage as specified in contracts.

^bBarney's contracts ran from 1 July to 31 December 1877. It is not clear who held transportation contracts for January through June 1878. Barney also contracted to send goods directly from San Francisco to each post.

^cRate per pound per entire distance.

ment employees are described in Cahill, *Shorter Hours*, pp. 70-82.

289. See Risch, *Quartermaster Support of the Army*, p. 491.

290. See Jack D. Foner, *The United States Soldier Between Two Wars: Army Life and Reforms, 1865-1898* (New York: Humanities Press, 1970), pp. 77, 84-87.

Chapter 7

1. Merritt to CQM, 12 June 1867, LS, Fort Davis, PR, RG 393, NA.

2. Whitehead to Commissary General of Subsistence, 26 July 1879, New Mexico, Cons. Corres. File, RG 92, NA.

3. Potter to Meigs, 15 September 1865, U.S., Congress, House, Annual Report of the Secretary of War, 1865, House Ex. Doc. No. 1 (Serial 1249), 39th Cong., 1st sess., 1865, p. 848.

4. Erna Risch, *Quartermaster Support of the Army, A History of the Corps, 1775-1939* (Washington, D.C.: Office of the Quartermaster General, 1962), p. 476.

5. Alexander, inspection report for Fort Union, 27 April 1867, OIG, RG 159, NA; Davis, inspection report for Fort Union, 28 December 1872, OIG, RG 159, NA.

6. Henry P. Walker, "Wagon Freighting in Arizona," *The Smoke Signal*, 28 (Fall 1973): 190. Walker lists three army posts in Arizona before the Civil War, choosing to ignore Fort Breckinridge, established in 1860.

7. Fergusson to West, 25 June 1862, and Fergusson to Drum, 19 August 1862, *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*, 128 vols. (Washington, 1880-1901), Series I, vol. 50, pt. 1, pp. 1159-62 and pt. 2, pp. 76-81.

8. Fergusson to Drum, 19 August 1862, *Official Records*, Series I, vol. 50, pt. 2, pp. 76-81. Distances between towns and posts in Arizona and Sonora are approximations; figures quoted in official documents are not consistent. For mileage to Lobos and Libertad, see Richard J. Hinton, *The Handbook to Arizona* (reprint; Tucson: Arizona Silhouettes, 1954), Appendix, p. xxii.

9. Fergusson to Drum, 12 November 1862, LR, OAG, RG 92, NA, M-619, roll 195.

10. Carleton to Seward, 8 March 1863, LS, Dept. NM, RG 393, NA, M-1072, roll 3; Fergusson to Bennett, 2 April 1863, LR, Dist. Ariz., RG 393, NA; Henry Pickering Walker, "Freighting from Guaymas to Tucson, 1850-1880," *Western Historical Quarterly*, 1 (July 1970): 296.

11. Davis to Carleton, 1 May 1864, *Official Records*, Series I, vol. 50, pt. 2, p. 835; Rogers to Davis, 31 May 1864, LR, Inspector, Dept. NM, RG 393, NA.

12. Coult to Colonel, 19 July 1864, LR, Inspector, Dept. NM, RG 393, NA; Proceedings of Board of Survey, 26 July 1864, LR, Dept. NM, M-1120, roll 22.

13. Walker, "Freighting from Guaymas to Tucson," p. 297. See Rodolfo F. Acuña, *Sonoran Strongman, Ignacio Pesqueira and His Times* (Tucson: University of Arizona Press, 1974), pp. 78-93, for French intervention in Sonora.
14. Smith to Meigs, 31 May 1866, and Wallen to Cole, 7 June 1866, Arizona, Cons. Corres. File, RG 92, NA.
15. Halleck to Meigs, 9 October 1866, Arizona, Cons. Corres. File, RG 92, NA. See contract dated 15 April 1867, Abstracts of Transportation Contracts, RG 92, NA.
16. Crittenden to McDowell, 13 October 1867, and Crittenden to Sherburne, 25 December 1867, LS, Dist. of Tucson, RG 393, NA; Seward to Secretary of War, 5 February 1868 (and enclosures), Mexico, Cons. Corres. File, RG 92, NA. See endorsement dated 20 August 1868 on Tully to Carleton, 31 May 1868, Arizona, Cons. Corres. File, RG 92, NA.
17. Report of Whittier, 9 June 1868, Arizona, Cons. Corres. File, RG 92, NA. Whittier was accompanied by Lt. Barnet Wagner; both men signed the report.
18. Report of Whittier, 9 June 1868, Arizona, Cons. Corres. File, RG 92, NA.
19. See contract dated 2 August 1869, Abstracts of Transportation Contracts, RG 92, NA; Tucson *Weekly Arizonan*, 25 December 1869, 22 January 1870.
20. See contract dated 15 June 1870, Abstracts of Transportation Contracts, RG 92, NA.
21. Smith to Meigs, 31 May 1866, Halleck to Meigs, 9 October 1866, Arizona, Cons. Corres. File, RG 92, NA; Meigs to Belknap, 19 May 1871, Colorado River, Cons. Corres. File, RG 92, NA.
22. Tucson *Weekly Arizonan*, 6 November 1869; Meigs to Belknap, 19 May 1871, Colorado River, Cons. Corres. File, RG 92, NA.
23. See Tucson *Weekly Arizonan*, 16 July 1870.
24. Tucson *Weekly Arizonan*, 28 January 1871, 8 April 1871.
25. The best study of steam transportation on the Colorado River is Francis H. Leavitt's "Steam Navigation on the Colorado River," *California Historical Society Quarterly*, 22 (March, June 1943): 1-25, 151-74. See also Richard E. Lingenfelter, *Steamboats on the Colorado River* (Tucson: University of Arizona Press, 1978). Neither focuses on military supply. See Kirkham, List of Transportation Rates (no date), Wallen to Cole, 7 June 1866, and Extract from Report to Gen'l James F. Rusling, 26 January 1867, Arizona, Cons. Corres. File, RG 92, NA.
26. Lingenfelter, *Steamboats on the Colorado River*, pp. 49-57; see contracts dated 1 June 1872 and 2 June 1873, Abstracts of Transportation Contracts, RG 92, NA.
27. Sacket to Inspector General, 12 May 1873, Inspection Reports, OIG, RG 159, NA.
28. Martha Summerhayes, Van-

ished Arizona, *Recollections of the Army Life of a New England Woman* (reprint; Glorieta, N.M.: Rio Grande Press, Inc., 1976), pp. 34-46. Haskell was Lt. Harry L. Haskell, 12th Infantry, stationed at Ft. Yuma. About two years later Martha Summerhayes, returning to Arizona by stagecoach after several months absence, forwarded her clothes and personal belongings on the ill-fated *Montana*. The steamer caught fire and ran aground near Guaymas on 14 December 1876. The ship and the freight it carried, including Martha's belongings and supplies for the army, were a total loss. Tucson Arizona Citizen, 30 December 1876; Summerhayes, *Vanished Arizona*, p. 201; Lingenfelter, *Steamboats on the Colorado River*, p. 57.

29. Sacket to Inspector General, 12 May 1873, Inspection Reports, OIG, RG 159, NA.

30. Fitch to AAG, 24 November 1863, and Atchison to Lee, 13 August 1864, LS, Fort Mojave, PR, RG 393, NA.

31. For sketches of Jaeger, see Frank C. Lockwood, *Pioneer Portraits, Selected Vignettes* (Tucson: University of Arizona Press, 1968), pp. 9-15; Stephen N. Patzman, "Louis John Frederick Jaeger: Entrepreneur of the Colorado River," *Arizonaiana*, 4 (Spring 1963): 31-37; and Janet L. Hargett, "Pioneering at Yuma Crossing, The Business Career of L. J. F. Jaeger, 1850-1887," *Arizona and the West*, 25 (Winter 1983): 329-54. Hooper to Hughes, 7 De-

cember 1878, and Kirkham to Allen, 12 June 1868, Fort Yuma, Cons. Corres. File, RG 92, NA. Fort Yuma was originally called Camp Independence. See Robert W. Frazer, *Forts of the West, Military Forts and Presidios and Posts Commonly Called Forts West of the Mississippi to 1898* (Norman: University of Oklahoma Press, 1965), pp. 34-35.

32. Kirkham to Allen, 12 June 1868, Fort Yuma, Cons. Corres. File, RG 92, NA; Jones to Fry, 1 May 1867, Inspection Reports, OIG, RG 159, NA. According to the terms of the contract that the army awarded Jaeger on 5 March 1866, he would receive \$4.75 for crossing each six-mule wagon and team, seventy-five cents for crossing a horse and rider, and twenty-five cents (in coin) for each footman. The contract is in Reg. Cont., QMG, RG 92, NA.

33. See endorsements on letter from Depot Quartermaster, dated 23 May 1872, LS, Dept. Ariz., RG 393, NA.

34. Davis to Carleton, 22 January 1865, LS, Inspector, Dept. NM, RG 393, NA.

35. Abstract of Quartermaster's Contracting, 7 January 1867, House Ex. Doc. No. 28 (Serial 1289), 39th Cong., 2d sess., 1866, p. 11; Contracts made by Quartermaster's Department, May 1868, Senate Ex. Doc. 59, pt. 2 (Serial 1317), 40th Cong., 2d sess., 1868, p. 2; Prescott *Arizona Miner*, 13 October 1866.

36. Prescott *Arizona Miner*, 13 July 1867; Byrd H. Granger, *Will C.*

Barnes' *Arizona Place Names* (Tucson: University of Arizona Press, 1960), p. 374.

37. Prescott *Arizona Miner*, 22 February 1868; Clendenin to Sherburne, 30 September 1868, and Clendenin to Winters, 6 March 1869, LS, Fort Whipple, PR, RG 393, NA.

38. Dean Smith, *The Goldwaters of Arizona* (Flagstaff: Northland Press, 1986), pp. 22, 32; Walker, "Wagon Freighting in Arizona," p. 188; Abstracts of Transportation Contracts, RG 92, NA.

39. McFerran to Meigs, 27 December 1863, LS to the Quartermaster General, CQM, Dept. NM, RG 393, NA.

40. Mason to Drum, 7 May 1866, LS, Dist. Ariz., RG 393, NA; the contracts are in Reg. Cont., QMG, RG 92, NA.

41. *Tucson Weekly Arizonian*, 18 April 1869; Charley to Lionel, 5, 20 February 1874 (Barron and Lionel Jacobs Business Records, Arizona Historical Society.)

42. Thomas E. Sheridan, *Los Tucsonenses, The Mexican Community in Tucson, 1854-1941* (Tucson: University of Arizona Press, 1986), p. 43; copy of Ochoa's contract enclosed with Bennett to West, 9 January 1864, LR, Dept. NM, RG 393, NA, M-1120, roll 25. Walker states that Ochoa entered into partnership with Pinckney R. Tully in 1863. Walker, "Wagon Freighting in Arizona," p. 187. Government documents show, however, that Tully and Ochoa were

freighting for the military in New Mexico at the start of the Civil War. See McFerran to Ochoa, 21 August 1861, and McFerran to Enos, 21 August 1861, LS, CQM, Dept. NM, RG 393, NA.

43. The contracts are in Abstracts of Transportation Contracts, RG 92, NA; *Tucson Weekly Arizonian*, 15 May 1869, 17 July 1869; Walker, "Wagon Freighting in Arizona," p. 198.

44. Endorsement by Cogswell, 10 June 1870, End. S., Subdistrict of Southern Ariz., RG 393, NA. Tully and Ochoa freighted even more goods for the army than contract registers suggest, for they also served as subcontractors. And on at least one occasion, in 1872, a contract awarded them does not appear in the registers.

45. Abstracts of Transportation Contracts, RG 92, NA; Davis to Green, 25 January 1866, LR, Dist. Ariz., RG 393, NA; Alexander to Sherburne, 18 August 1868, and Alexander to Jones, 10 June 1869, LS, Subdistrict of the Verde, RG 393, NA.

46. Walker, "Wagon Freighting in Arizona," p. 185.

47. Abstracts of Transportation Contracts, RG 92, NA. For contractors and rates for military transportation in Arizona during the 1870s, see Appendix Tables 12 and 13 in this volume.

48. Abstract of Bids opened 15 May 1871, Papers in the Matter of Proposals for Wagon Transportation

in Arizona during the fiscal year ending 30 June 1872, Meigs to Secretary of War (and endorsements), 13 June 1871, and Andrews to Secretary of War, 21 June 1871, Arizona, Cons. Corres. File, RG 92, NA.

49. Whiting to Meigs, 22 June 1871, and Meigs to Secretary of War, 1 September 1871, Arizona, Cons. Corres. File, RG 92, NA.

50. Goldwater to Secretary of War, 30 September 1871, and Belknap to Goldwater, 24 October 1871, Arizona, Cons. Corres. File, RG 92, NA; see documents cited in footnote 48.

51. Endorsement on letter from Neahr, dated 7 October 1871, LR, Camp Lowell, PR, RG 393, NA; Endorsements on letters from Neahr, dated 24 February 1872, 13 March 1872, 10 September 1872, LS, Dept. Ariz., RG 393, NA; Jacobs and Co. to Neahr, 23 May 1872, and Barron to Pa, 23 May 1872 (Jacobs Manuscripts, University of Arizona).

52. Crook to Schofield, 21 September 1872, U.S., Congress, House, Annual Report of the Secretary of War, 1872, House Ex. Doc. No. 1, pt. 2 (Serial 1558), 42nd Cong., 3d sess., 1872, pp. 72-73; Crook to AAG, 22 September 1873, LS, Dept. Ariz., RG 393, NA.

53. See biographical sketch of James Mitchell Barney by his grand nephew James M. Barney in the George F. Hooper File, Arizona Historical Society. See also Abstracts of Transportation Contracts, RG 92, NA. Barney died in 1914 at his

home in London, England. In providing transportation for the 8th Infantry, Barney received 2 cents per pound per hundred miles for baggage and 8 cents per mile for each laundry and sick soldier.

54. Kautz to AAG, 20 October 1875, LS, Dept. Ariz., RG 393, NA.

55. Robert Athearn, *The Denver and Rio Grande Western Railroad* (reprint; Lincoln: University of Nebraska Press, 1977), pp. 4, 5, 23; Eaton to [Meigs], and endorsements, 26 November 1872, LR, CQM, Dist. NM, RG 393, NA.

56. Copy of Lovell's contract is in Contracts, Fort Cummings, PR, RG 393, NA; Sacket to Inspector General, 30 June 1873, Inspection Reports, RG 159, NA.

57. Reynolds to [Meigs], and endorsements, 7 March 1877, Ingalls to AAG, 22 August 1877, and McDowell to Adjutant General, 29 August 1877, Arizona, Cons. Corres. File, RG 92, NA.

58. Hodges to Meigs, 2 September 1878, U.S., Congress, House, Annual Report of the Secretary of War, 1878, House Ex. Doc. No. 1, pt. 2 (Serial 1843), 45th Cong., 3d sess., 1878, p. 356; Eagan to Macfeely, 15 August 1878, Arizona, Cons. Corres. File, RG 92, NA. The distance between Fort Garland and Camp Apache was 456 miles.

59. Eagan to AAG, 6 September 1878, and Eagan to AAG, 3 September 1879, Arizona, Cons. Corres. File, RG 92, NA; Keith L. Bryant, Jr., *History of the Atchison, Topeka*

and Santa Fe Railway (reprint; Lincoln: University of Nebraska Press, 1982), p. 61.

60. Bert M. Fireman, *Arizona, Historic Land* (New York: Alfred A. Knopf, 1982), p. 143; Eagan to Macfeely, 30 August 1880, Arizona, Cons. Corres. File, RG 92, NA.

61. Bryant, *History of the Atchison, Topeka and Santa Fe Railway*, pp. 79-80, 84-95; Ray Allen Billington and Martin Ridge, *Westward Expansion, A History of the American Frontier*, Fifth Edition (New York: Macmillan Publishing Co., 1982), p. 586; Eagan to Macfeely, 8 September 1882, Arizona, Cons. Corres. File, RG 92, NA.

62. Wotherspoon to AAG, 29 July 1881, LR, Dept. Ariz., RG 393, NA; Reg. Cont., QMG, RG 92, NA.

63. Abstract of contracts for wagon transportation, for fiscal year ending 30 June 1883, U.S., Congress, House, Annual Report of the Secretary of War, 1883, House Ex. Doc. No. 1, pt. 2 (Serial 2182), 48th Cong., 1st sess., 1883, pp. 540-41. The abstract of contracts lists the distance between Maricopa and Whipple as 129 miles and between Maricopa and Verde as 130 miles.

64. C. L. Sonnichsen, *Tucson, The Life and Times of an American City* (Norman: University of Oklahoma Press, 1982), p. 105; Lockwood, *Pioneer Portraits*, p. 82; Sheridan, *Los Tucsonenses*, p. 48. Ochoa died in 1888 at age fifty-seven on a visit to Las Cruces, New Mexico.

65. Henry Pickering Walker, *The Wagonmasters, High Plains Freighting from the Earliest Days of the Santa Fe Trail to 1880* (Norman: University of Oklahoma Press, 1966), pp. 238-41; Abstract of Contracts by the Quartermaster's Department, 24 April 1862, U.S., Congress, House Ex. Doc. No. 101 (Serial 1136), 37th Cong., 2d sess., 1862, p. 5.

66. Abstracts of Transportation Contracts, RG 92, NA; McFerran to Carleton, 28 August 1864, LR, OAG, RG 94, NA, M-619, roll 286; McFerran to Meigs, 29 August 1864, LS to Quartermaster General, CQM, Dept. NM, RG 393, NA.

67. *Santa Fe Gazette*, 11 February 1865; Leo E. Oliva, *Soldiers on the Santa Fe Trail* (Norman: University of Oklahoma Press, 1967), p. 161; Abstracts of Transportation Contracts, RG 92, NA; Walker, *The Wagonmasters*, pp. 243-44. The name of the railroad building west from Kansas City at this time was the Union Pacific, Eastern Division. In 1869 it became the Kansas Pacific Railway.

68. Meigs to Stanton, 8 November 1865, U.S., Congress, House, Annual Report of the Secretary of War, 1865, House Ex. Doc. No. 1 (Serial 1249), 39th Cong., 1st sess., 1865, pp. 112-14; Darlis A. Miller, "Military Supply in Civil War New Mexico," *Military History of Texas and the Southwest*, 16 (Number 3, 1982): 191.

69. Enos to Carleton, 23 Novem-

ATTACHMENT D
Recent Occurrence of Beaver in SPRNCA

SAN PEDRO RIPARIAN NATIONAL CONSERVATION AREA



San Pedro Riparian National Conservation Area

**National Landscape Conservation System
FY 2009 Annual Manager's Report**

- Two banding stations are being operated in the SPRNCA one at San Pedro House and the other by Green Kingfisher Pond.



Banding Yellow-billed Cuckoo at the Garden Wash MAPS station

- The data being collected at these banding stations is contributing to the local knowledge of avian: migration, molt migration, production, and survival.

Along with local knowledge, the data also contributes to a bigger picture. The information gained from these banding stations is playing a major role in management actions for many about every aspect of the continued preservation of the San Pedro Riparian National Conservation Area.

- The data is inputted into national databases both at the Institute of Bird Populations, Point Reyes Station, California, and the bird banding laboratory where population trends, migration paths, and much more can be seen and analyzed.

Beaver (*Castor canadensis*) were reintroduced to the San Pedro Riparian NCA after having been extirpated by fur trappers by 1894. A total of 15 beaver were reintroduced during 1999, 2000, and 2002. By 2008, the estimated beaver population on the Upper San Pedro River was at least 150, based on about 20 colonies with 33 dams on the NCA, with additional beaver reported in Mexico and as far north as Aravaipa Canyon.

- During 2009, the location of beaver dams from 2000-2008 was determined through BLM wildlife biologists' observations and wet/dry mapping data. ArcGIS was used to map the expansion and site fidelity of these dams from 2000-2008.
- A total of six caches (areas of vegetation with beaver herbivory) were monitored during the winter of 2008-2009. Of these, one cache contained only Fremont cottonwood, two caches contained both Fremont cottonwood and Goodding willow, and three caches included Fremont cottonwood, Goodding willow, and seep willow (*Baccharis salicifolia*).

The purposes of beaver reintroduction on the NCA were many. As a keystone species, beaver may have a large influence on community diversity and ecosystem structure through their tree felling and dam building behavior. Beaver dams may increase storage capacity and lead to greater flows during dryer periods, which may result in enhanced flow in intermittent streams. Beaver impoundments may increase the area of riparian habitat, and elevate water tables through groundwater recharge. By functioning as sediment traps, beaver ponds accumulate organic matter, and also reduce erosion potential. By doing so, beaver dams may reduce the sediment carrying capacity of the stream and deposition.

- A general overall increase in the amount of ponded water was noted during the FY 2009.



Ponded water behind beaver dam -- San Pedro River

The annual spring and fall fish monitoring was conducted in April and September by Jerry and Sally Stefferud, Rob Clarkson, Dr. Paul Marsh, and the BLM wildlife biologist.

- Fish numbers were low to moderate, with the remaining two species of native fish, longfin dace (*Agosia chrysogaster*) and desert sucker (*Catostomus clarkii*), documented at the Charleston and Hwy. 90 sites.
- Two additional non-native fish, red shiner (*Cyprinella lutrensis*) and channel catfish (*Ictalurus punctatus*) were also documented for the first time at the Charleston site, although anglers have previously caught sizable channel catfish in the area as early as 2002.

The federally endangered Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*) and southwestern willow flycatcher (*Empidonax trailii extimus*) continue to be monitored on the NCA by EEC, Inc. as required under species specific conservation measures of the biological opinion "Proposed Ongoing and Future Military Operations and Activities at Fort Huachuca."

BEAVERS

Reintroduced beavers branching out in San Pedro



MAY 21, 2012 12:00 AM • [DOUG KREUTZ ARIZONA DAILY STAR](#)

Aquatic rodents might not instantly pop to mind when you think of Southern Arizona wildlife - but they're thriving this spring along the San Pedro River near Sierra Vista.

We're talking beavers - those dam-building, tail-slapping mega-rodents more often associated with mountain streams than arid-region rivers.

"Beavers are doing really well right now on the San Pedro," said Marcia Radke, a wildlife biologist with the U.S. Bureau of Land Management. "We're estimating the beaver population at about 100."

That's a big change since just a few beavers were reintroduced into the river beginning in 1999 - about a century after trappers wiped out the last native beavers there.

Fifteen of the critters were released on the San Pedro Riparian National Conservation Area from 1999 to 2002 - and they quickly got, well, busy as beavers in expanding their population.

dozens of dams built

Beavers have built many dams along the river in recent years, Radke said.

They're not permanent structures - often being washed away by heavy monsoon flows.

"The high number so far was 46 dams in 2008," Radke said. "But that year we had a good monsoon, and it took out all the dams."

In recent years, she said, beavers have maintained about 30 dams - most of them along a stretch of the river between the Mexican border and an area south of St. David.

Radke said temporary loss of dams doesn't appear to have a negative effect on the beaver population - and might even help it expand.

"The flooding isn't something I look upon as a negative thing," she said. "It allows the sub-adults to leave their family colonies and take up their own territories and mates. It's a way of expanding the population into new areas."

DAM BENEFITS

Beaver dams, Radke said, play a role in maintaining the vitality of the river, and also appear to benefit some types of vegetation.

The dams cause river water to "pond" and slow down long enough to soak into the aquifer.

"That increases storage, and surface water is released over a longer period of time" - thereby prolonging seasonal stream flows, Radke said.

Among plants that might benefit from beaver dams is the endangered Huachuca water umbel.

Radke said the umbel, which requires perennial water, has been growing this year near a dam in an area where the plant hadn't been documented in the past.

GNAWING CONCERNS

Not everyone is happy with the beavers' work along the river.

"Some people don't like them chewing on the trees," Radke said. "Beavers eat the bark of cottonwoods and willows" and take down some trees for their dams.

THE "SURFING BEAVER"

Many beavers stay put along a stretch of the river east of Sierra Vista, but a few have felt the urge to travel.

"One, which was tracked with a collar transmitter, migrated all the way to Aravaipa Canyon about 100 miles away," Radke said.

Another reportedly made it to a point near where the San Pedro flows into the Gila River - prompting a nickname: "the surfing beaver."

DID YOU KNOW?

Beavers are monogamous and stay mated for life.

Contact reporter Doug Kreuz at dkreutz@azstarnet.com or at 573-4192.

**RIPARIAN CONDITIONS ALONG THE SAN PEDRO RIVER
PROPER FUNCTIONING CONDITION
RIPARIAN ASSESSMENT REPORT**



**THE NATIONAL RIPARIAN SERVICE TEAM
NOVEMBER 2012**



National Riparian Service Team

3050 NE 3rd Street • Prineville, Oregon 97754 • (541) 416-6700 • FAX (541) 416-6798

November 16, 2012

Subject: Proper Functioning Condition (PFC) Riparian Assessment Report, San Pedro River, San Pedro Riparian National Conservation Area, AZ

In the fall of 2010, the Bureau of Land Management (BLM) in Arizona requested assistance from the National Riparian Service Team (NRST) relative to issues concerning the San Pedro Riparian National Conservation Area (SPRNCA). Specifically, the request focused on two main areas:

- (1) Create a mechanism to blend the scientific and social perspectives sufficient to support development of a shared strategy for moving forward over the next 10 years, with a focus on agreed upon purpose and priorities. Create a mechanism to promote better coordination among individual efforts under the umbrella of a larger community-based effort.*
- (2) Bring together community members/stakeholders and technical specialists to: consider existing data and analyses; develop a common understanding of current conditions and trends in terms of surface water flows; determine the implications of baseline condition and trends for riparian function and values; and outline the scope of management options that are currently occurring and additional actions that might be important to maintain and enhance riparian function.*

In an effort to meet this request, a number of activities have occurred including a comprehensive situation assessment and subsequent stakeholder meetings, briefings, technical workshops and time spent on the ground.

Most recently, BLM managers, specialists, and interested stakeholders accompanied the NRST as they conducted Proper Functioning Condition (PFC) riparian assessments on approximately 51 miles of the San Pedro River through the SPRNCA, during April 11-20, 2012. The attached report summarizes the PFC assessment findings, identifies issues and outlines management considerations. Assessment findings provide an important foundation for understanding the current condition of a system, limiting factors within and outside BLM control, and areas where additional information is needed. This understanding then informs the process by which objectives relating to desired future riparian conditions are set, and alternative management and monitoring approaches are considered; an important component of the Resource Management Plan revision process currently underway for the SPRNCA. Please contact Laura Van Riper at 541-416-6702 or lvanripe@blm.gov if you have any questions or concerns.

Sincerely,

Steve Smith

Steve Smith, Team Leader
National Riparian Service Team

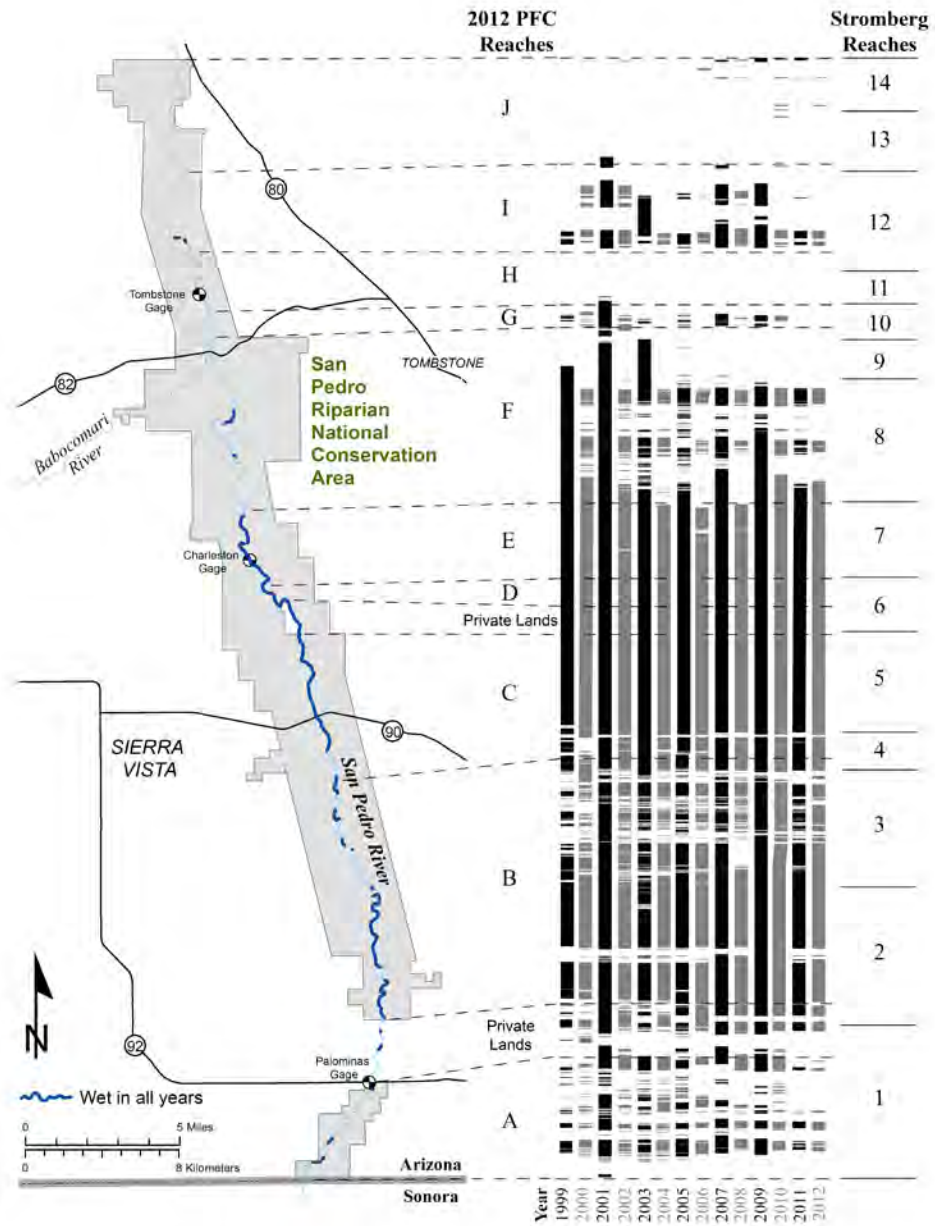


Figure 7. PFC assessment reaches, also showing Stromberg reaches from Leenhouts 2006 and wet/dry mapping results as of 2012 courtesy of The Nature Conservancy. The heavy river line (darker blue) shows reaches which were mapped as consistently wet in all 14 years surveyed. Bars on right side represent wet reaches for each year, 1999–2012. The black and gray lines are different colors simply to provide visual clarity. For more information on interpreting the wet/dry mapping results go to http://azconservation.org/projects/water/wet_dry_mapping.

San Pedro River Photo Sheets
SPRNCA, Reach A
Photographer: Mike Lunn, April 11, 2012



13– Upstream to small beaver dam building on sediment deposit.



14 – Upstream in confined section.



15 – Example of a long pool from the backwater effects of a tributary fan (“ponded” channel form).



16 - Large beaver dam – even these large dams likely wash out each high flow but are important at low flow.



17 – Waypoint 806, straightened section, more meander expected given substrate and valley width.



18 – Waypoint 807, large wood deposit forming meander to left.

San Pedro River Photo Sheets
SPRNCA, Reach A
Photographer: Mike Lunn, April 11, 2012



31 – Waypoint 819, some surface flow by large wood pile.



32 – Waypoint 820, large pile of large wood off-channel (stream left) looking upstream.



33 – Waypoint 820, down view of huge deposits of wood.



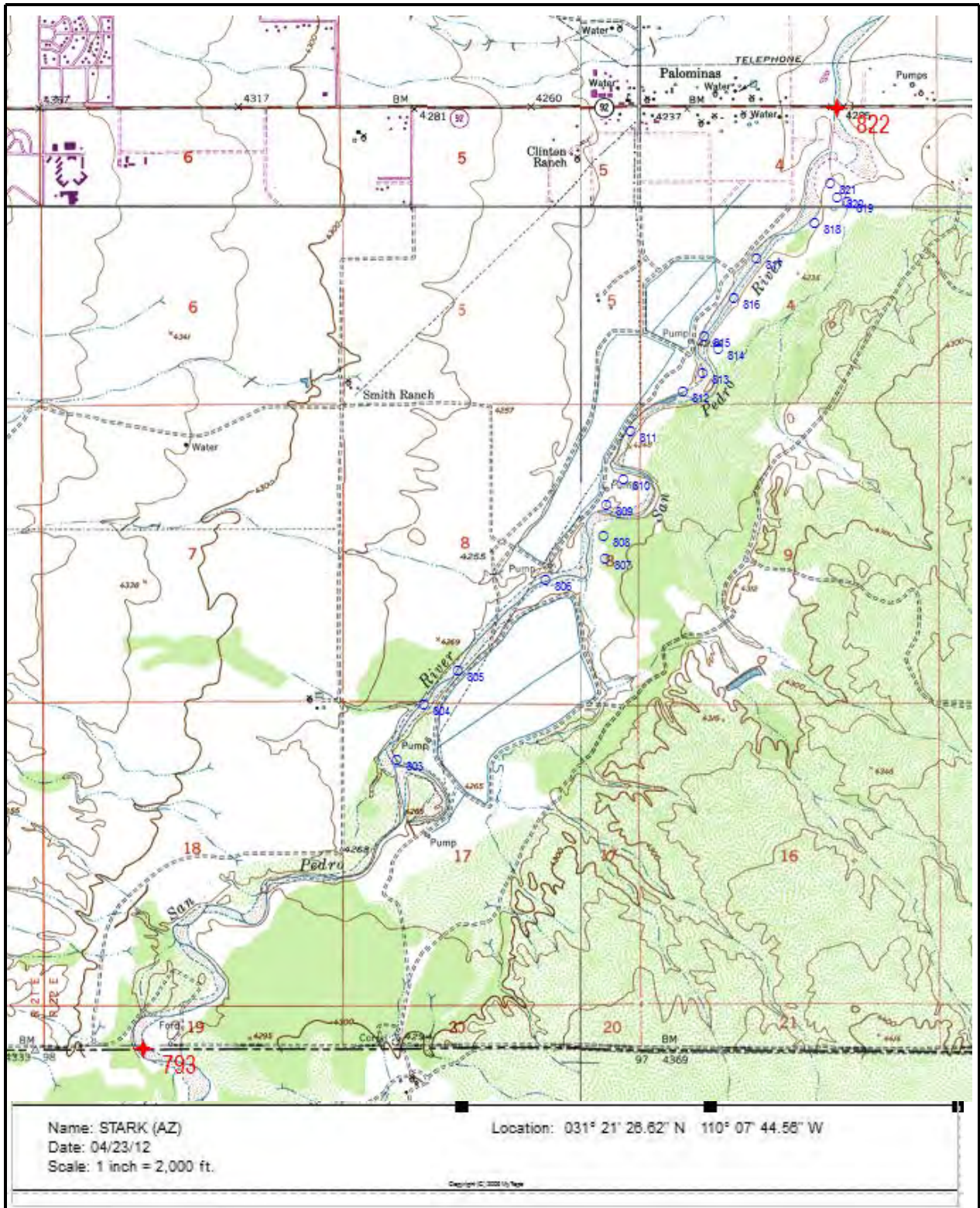
34 – Upstream to beaver pond on stream right.



35 – Huachuca water umbel just downstream from beaver dam.



36 – Characteristic community of lime-green, twisted growth form of water umbel in algae.



San Pedro River – San Pedro Riparian National Conservation Area A
 PFC Reach A – Completed April 11, 2012 – Scale Approximate
 Waypoints 793 - 822



49 – Discussing what we’ve been seeing so far on the reach, we tried to group up several times a day to make sure we were seeing the same things.



50 – Waypoint 827 - upstream to overflow channel (photo left), standard form river channel photo right.



51 – Waypoint 828 - note thalweg forming in colonizing vegetation, rivers/streams want to meander.



52 – Below waypoint 828 - looking down to debris jam/beaver dam, channel filled with herbaceous growth as sediments collect. May develop cienega characteristics if holds.



53 – Below dam, lower end of beaver dam on tributary fan, pond extends upstream nearly ½ mile.



54 – Waypoint 829 – defoliated cottonwood trees from the caterpillars.



55 – Shrubs and trees growing near the banks.



56 – Caterpillars that have fallen from the trees.



57 – More caterpillars.



58 – Waypoint 831 – Pondered form created by tributary fan.



59 – Lower end of beaver dam on tributary fan, pond backs up nearly 1/2 mile upstream.



60 – Tributary fan area, same beaver dam as photo 59.



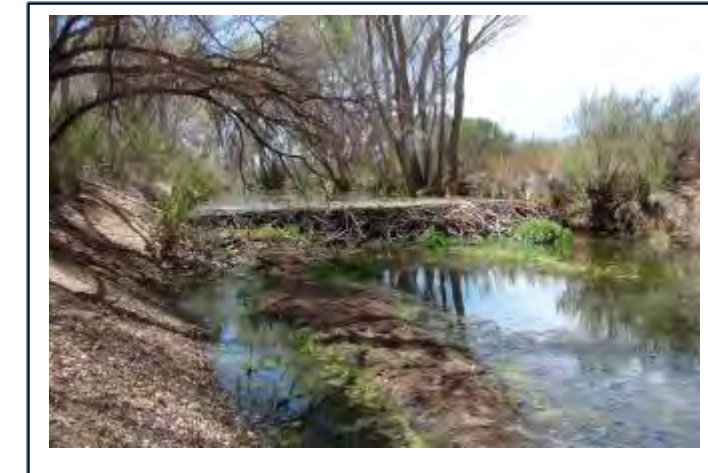
61 – Beaver dam at end of ponded form.



62- Waypoint 833, cobble to left (stream right) of channel is almost like cement, transition section of stream.



63 – Very large beaver dam with advantage provided by large down tree.



64– Upstream view of dam, good stabilizing vegetation forming below.



65 –Waypoint 836, Bermuda grass on low-cohesive soils, stream washed around bank behind during previous high flow.



66 – Taking notes on beaver dam.



67 – Waypoint 837 - large sediment deposit, stream adjusting grade through sediments.



68 – Reflection picture.



99– Waypoint 890, beginning of extensive cohort of 5-10 year old cottonwood, upstream all has been older.



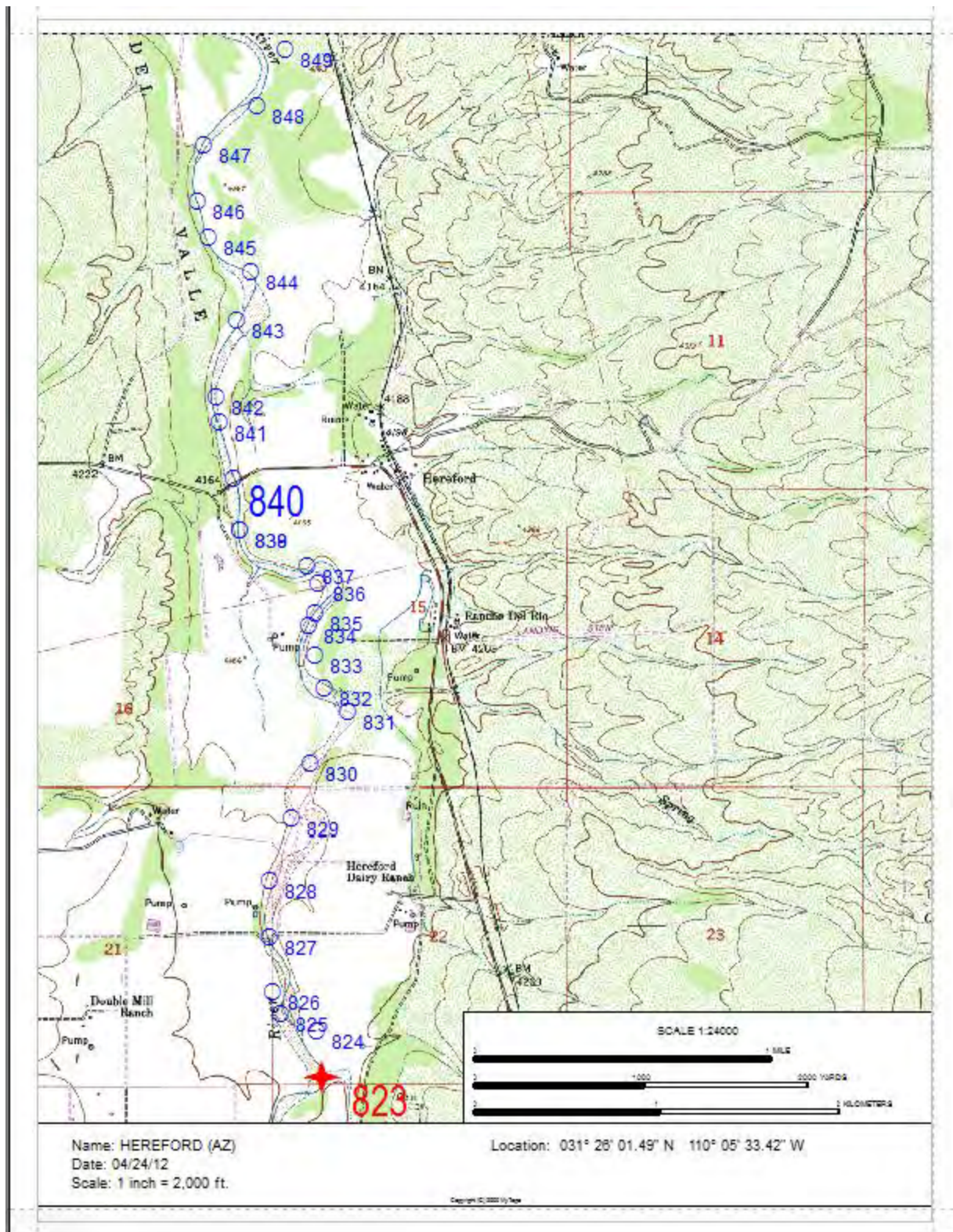
100 – More young cottonwood in two separate lines, planted by different flood events but relatively close in time.



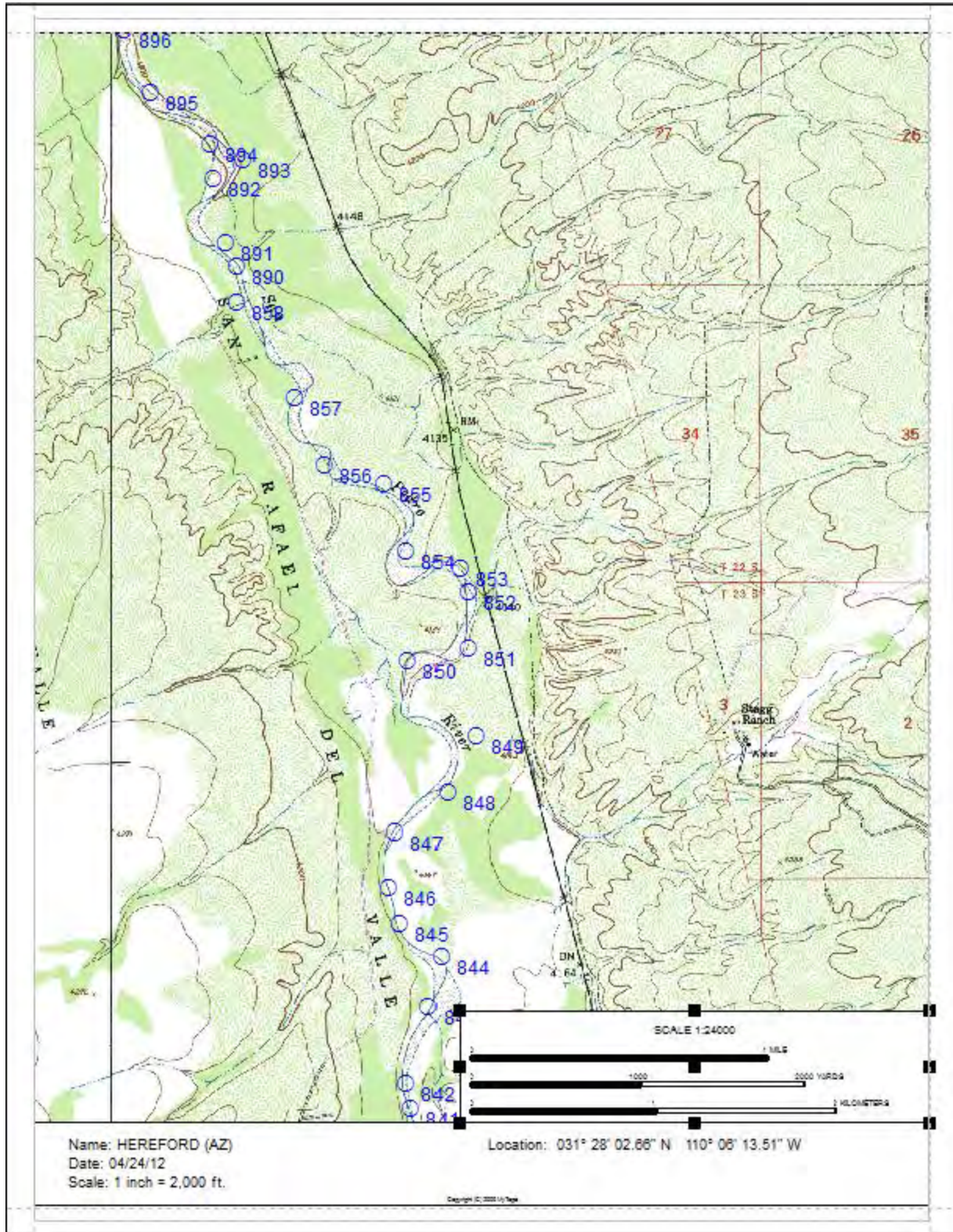
101 –Upstream view of beaver dam contributing to ponded form above.



102 – Waypoint 892, tall bulrush creating stable community, expanding up bank and into water.



SPRNCA PFC Reach B (south section)
 Waypoints 823 – 849 (reach continues north)
 April 12, 2012



SPRNCA PFC Reach B middle
 Waypoints 844 – 895
 April 13, 2012

San Pedro River Photo Sheets
SPRNCA, Reach D
Photographer: Mike Lunn, April 16, 2012



163 – Waypoint 903, downstream from reach beginning, mouth of wash – wide valley.



164 – Large cottonwood undercut and down, forcing meander development.



165 – Small unstable beaver dam on sediment pile, several dams not being maintained.



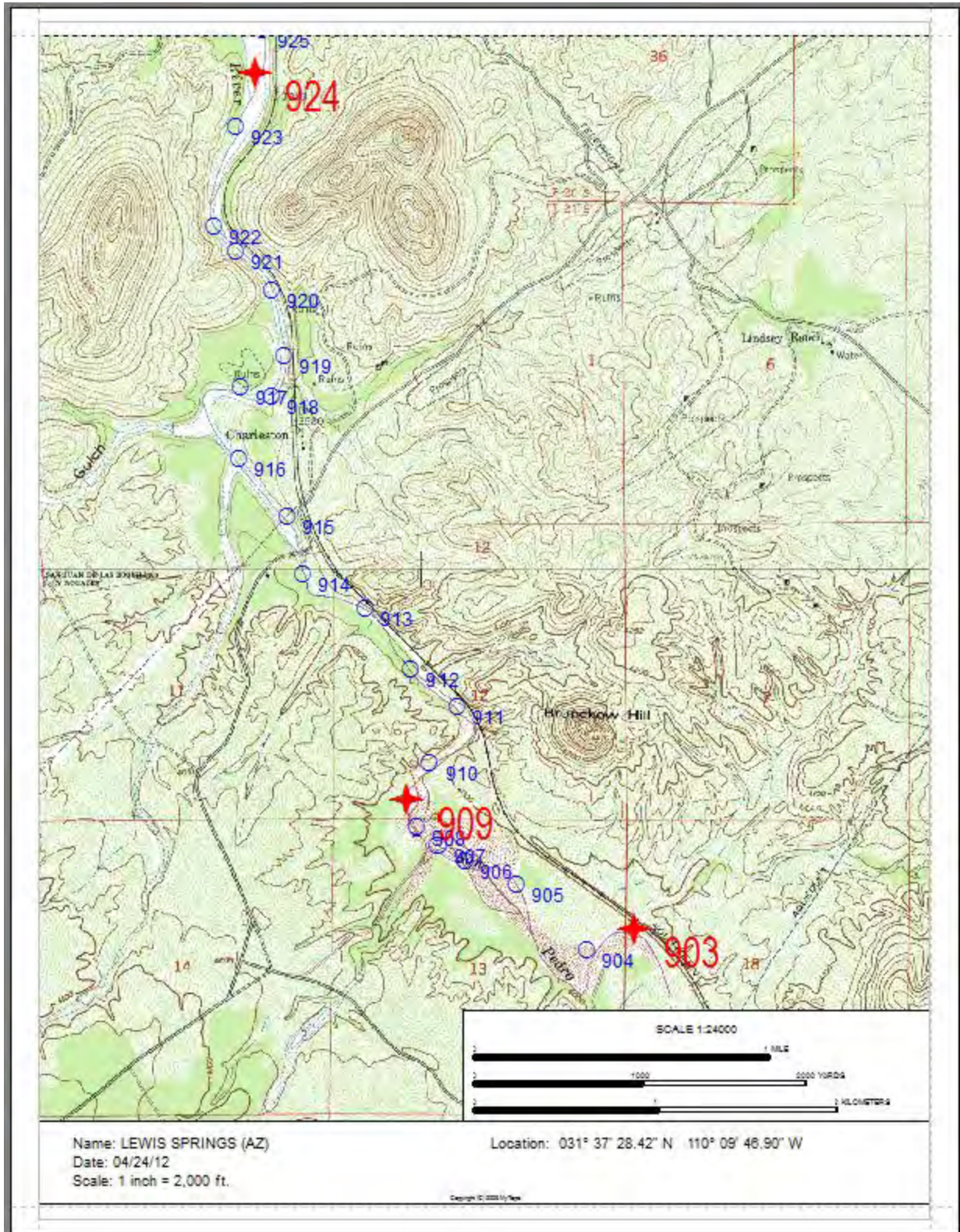
166 – Downstream view. More herbaceous vegetation is needed on the bars/banks to process sediments.



167 – Waypoint 907, up Escapule Wash. These ephemeral washes carry much sediment during monsoon storms.



168 – Waypoint 907, down river looking at bars left, seep willow and bulrush on right bank.



SPRNCA PFC Reach D
 Waypoints 903 – 909
 April 16, 2012

San Pedro River Photo Sheets
SPRNCA, Reach E
Photographer: Mike Lunn, April 16, 2012



171 – Waypoint 909, downstream from reach beginning, heavy cobble.



172 – Beaver dam, upstream view, provides additional water storage for plant establishment.



173 – Waypoint 910, down view, bulrush developing right, seep willow on left bank.



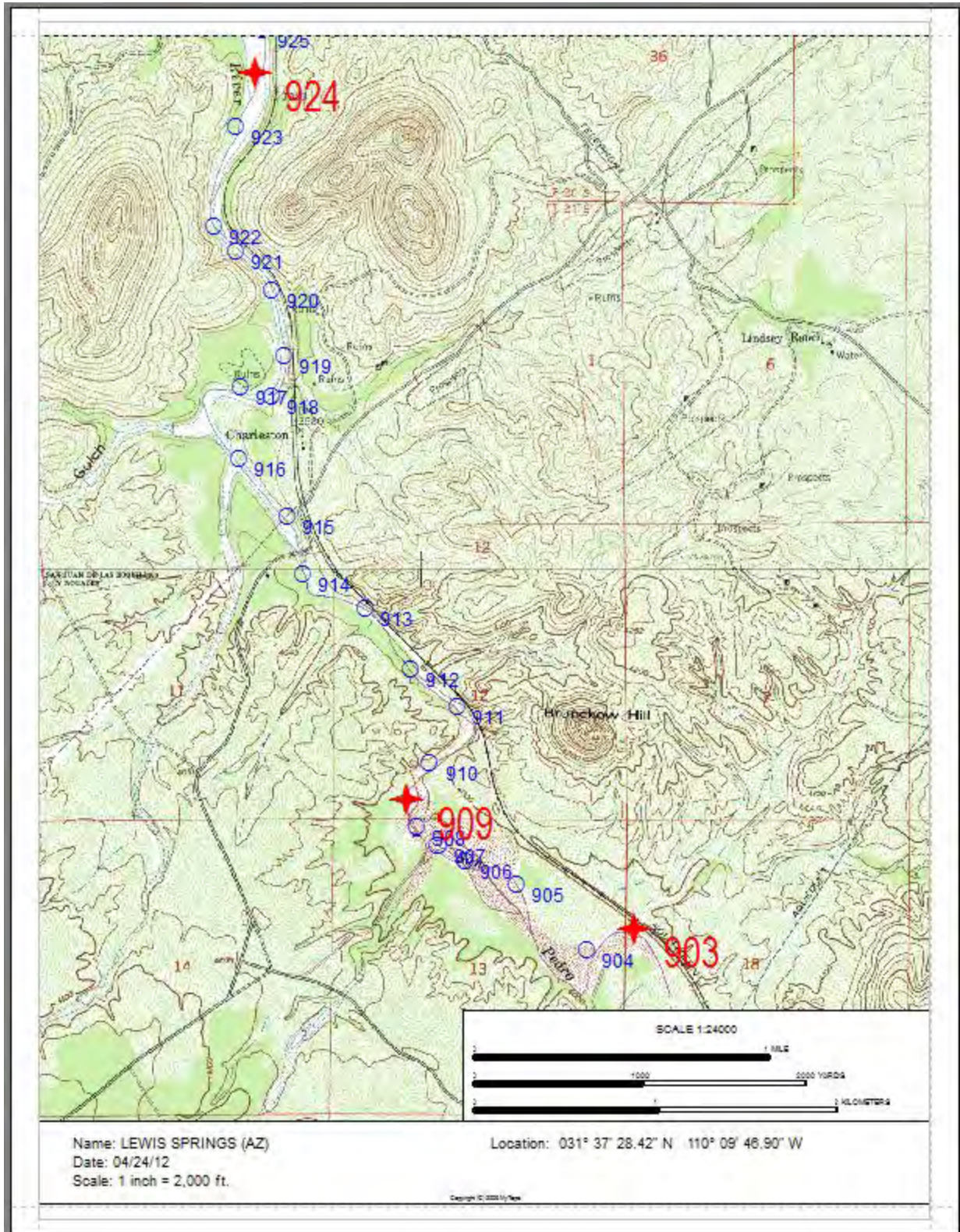
174 – Waypoint 911, bulrush rhizome extending toward stream, rhizome at least 1' deep, starting new plants (white tip).



175 – Waypoint 912, downstream view, bulrush on opposite bank.



176 – Waypoint 913, upstream view, good vegetation development.



SPRNCA PFC Reach E
Waypoints 909 – 924
April 16, 2012