Administrative Trials, Environmental Consequences, and the Use of History in Arizona's Tonto National Forest, 1926–1996

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Managers of the Tonto National Forest attempted to rehabilitate the range that had been decimated by ranching. Turning to the forest's history as a management tool, they hoped to rehabilitate the rangeland by approximating past land-use patterns. However, history eventually became irrelevant as recreationists from Phoenix, not traditional ranchers, became the dominant forest users.

In the 1920s, two foresters evaluated central Arizona rangelands with pointed criticism. Fred W. Croxen, a district forester for Tonto National Forest, described the range as having reached "the ragged end of it all." The ranger delivered his appraisal at a grazing conference in Phoenix and arrived at his conclusion after visiting with pioneer ranchers from Tonto Basin. Their accounts described a thriving ranching economy associated with an abundant grassland. The "ragged end" of the 1920s contrasted sharply with the lush range the pioneer ranchers recollected. Ultimately, Croxen based his assessment on a historical reconstruction of the range. Aldo Leopold, the chief of operations for the Forest Service's southwestern district, also severely judged central Arizona's ranges. He offered a similar description both in substance and methods. He explained matter-of-factly: "[W]hen the cattle came the grass went, the fires diminished, and erosion began." Like Croxen, Leopold measured the current range conditions against its history. Using early white explorers' and settlers' accounts, he reconstructed the land's history and concluded an unmitigated ecological decline since the introduction of domestic cattle and sheep.[1]

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[1] Fred W. Croxen, "History of Grazing on Tonto," paper presented at the Tonto Grazing Conference (Phoenix, November 4–5, 1926). Copy in author's possession. Leopold's essay was not published in his lifetime. He had drafted the essay the year after Croxen's address and revised it in 1933. Aldo Leopold, "The Virgin Southwest," in *The River of the Mother of God and Other Essays by Aldo Leopold*, ed. Susan L. Flader and J. Baird Callicott (Madison, WI, 1991), 179.

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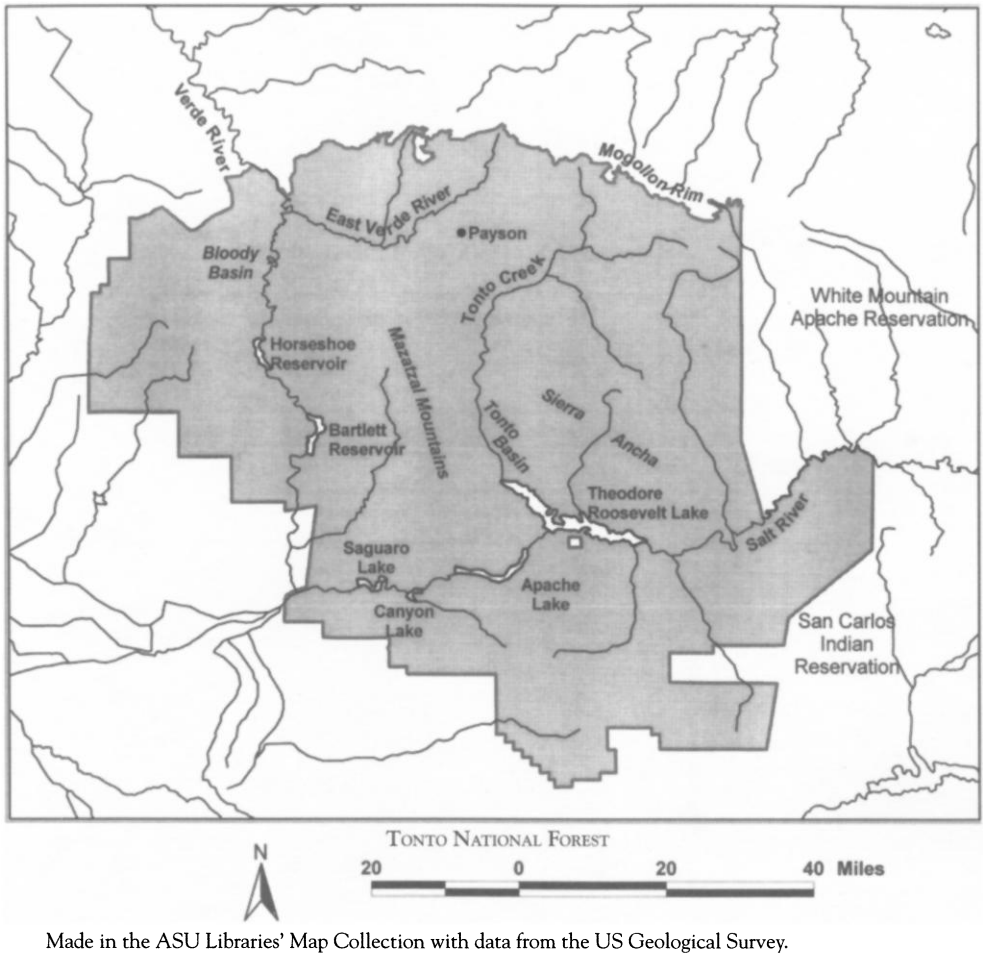

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Randall brothers cattle allotment, bottom of the East Verde river. Left side is fenced homestead and contains a good stand of perennial grasses. Dead animal on right side with depleted range with only scant annuals left. Photo taken in 1931 by unknown photographer. Courtesy of the Tonto National Forest.

These two descriptions reveal several things to today's western and environmental historians. First, they provide clear accounts of a southwestern range in the 1920s that fifty years of intensive grazing had devastated. Like so many other locations in the West, the forest and range environment had changed since white Americans displaced the native inhabitants, and that transformation left little grass and abundant erosion on the range. Next, both Croxen and Leopold viewed history as the best judge of natural change. And although removed from western environmental historiography by half a century and several academic disciplines, these historically sensitive foresters seemingly anticipated the declensionist narratives commonly employed by western and environmental historians. That is, in their historical accounts, these practical foresters constructed stories of environmental deterioration consistent with the accounts written by later academic historians.[2] Finally, both recognized history as a

[2] For the question of narrative and declension, see William Cronon, "A Place for Stories: Nature, History, and Narrative," *Journal of American History* 78 (March 1992): 1347–76. Typical examples of western declensionist stories include Donald Worster, *Dust Bowl: The Southern Plains in the 1930s* (New York, 1979); Richard White, *Land Use, Environment, and Social Change: The Shaping of Island County, Washington* (1980; reprint, Seattle, 1992); Donald Worster, *Rivers of Empire: Water, Aridity, and the Growth of the American West* (New York, 1985); Marc Reisner, *Cadillac Desert: The American West and Its Disappearing Water*, revised and updated (New

potential partner in rehabilitating resources. Put in different terms, they moved beyond the declension to suggest management programs based on goals partially informed by history. Croxen urged Forest Service employees to rebuild the range into a usable economic resource, while Leopold recommended more specific programs, including the reduction of herds, the reintroduction of fire, and the staving off of erosion. Using the past to advance the goals of a group or a place became a common strategy in the twentieth-century West. Central Arizona in the 1920s stood clearly at a historical and environmental crossroads. The previous half century wrote a devastating story on the landscape. If the foresters had their way and could work their will, the next half century would revise that typical declension and write a story of recovery and prosperity in Tonto National Forest. Unfortunately, Forest Service managers could not anticipate or negotiate all the environmental and political challenges and obstacles.

This case study reveals historical developments whose consequences transcend concerns in Arizona's Tonto National Forest. It demonstrates consistent attempts throughout much of the twentieth century to rehabilitate a landscape. Western environmental historians have quite properly investigated rampant mismanagement among federal resource agencies and private enterprises, but in the process they have not confronted management plans and achievements often enough. The efforts in Tonto National Forest since the 1920s suggest that the Forest Service recognized failures and worked steadfastly to remedy these problems. Conservation in western federal lands clearly forms a central component of twentieth-century history, and so the experience of Tonto National Forest managers contributes to a larger, generally untold, story of federal resource rehabilitation. Their accomplishments reveal elements commonly present in effective conservation, such as select ranchers in local populations and dedicated resource managers. Their failures, on the other hand, show persistent obstacles, such as local political power concentrations or the ambiguous relationship between federal agencies and the environmental movement. The dynamic in this particular national forest may, in fact, qualify and restructure the typical narrative in the West's environmental history.

Most interesting of all, perhaps, is the relationship of history to management. As Croxen's and Leopold's statements indicate, early Forest Service employees used the past to help them advise future management decisions, such as grazing reduction; they hoped to re-create a usable future landscape based on their best approximation of the

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York, 1993); Paul W. Hirt, *A Conspiracy of Optimism: Management of National Forests since World War Two* (Lincoln, 1994); Robert Bunting, *The Pacific Raincoast: Environment and Culture in an American Eden, 1778–1900* (Lawrence, 1997); William G. Robbins, *Landscapes of Promise: The Oregon Story, 1800–1940* (Seattle, 1997). A more subtle account, though still ultimately declensionist, can be found in Nancy Langston, *Forest Dreams, Forest Nightmares: The Paradox of Old Growth in the Inland West* (Seattle, 1995). In his historiographical overview of western history, Gerald D. Nash complains bitterly about the negativity and fragmentation seen in the recent trend to locate decline, destruction, and victimization in western history. See Nash, *Creating the West: Historical Interpretations, 1890–1990* (Albuquerque, 1991), esp. 153–8.

past landscape. Throughout the middle decades of the twentieth century, foresters and other resource managers kept that vision alive and pursued it actively. By the 1990s, however, the leading constituents were new urban recreationists whose management needs did not require looking to past landscapes. Accordingly, land managers today cannot look to the past to help them manage for the future. The environmental movement, along with the decline in the open-range cattle industry, has complicated and even compromised Forest Service goals substantially by substituting new constituencies for the old. The twentieth-century story in central Arizona adds an important chapter in western environmental history.[3]

Even as this region's recent history contributes a new perspective to twentieth-century western history, its long-term history strikes familiar chords.[4] In the 1870s white agriculturists and merchants came to Arizona in increasing numbers, settling in the Salt River Valley and building Phoenix, Tempe, Mesa, Glendale, and other communities. Using canals left from the pre-Columbian Hohokam Indians' agricultural development, they irrigated their fields from water diverted from the Salt River. The Salt's watershed lay to the east and north of the valley. In that basin and range region, white ranchers began arriving simultaneously, and their livestock heavily grazed the valleys and mountainsides. Increasing use of this mountainous watershed, accelerating demands by valley farmers for water, and a growing conservation movement centered in the federal government and embracing values of efficiency and maximization of use eventually led to the reservation of Tonto National Forest in 1905. That same year, Congress approved funds to build Roosevelt Dam on the Salt River under provisions of the 1902 Newlands Act. The correlation was clear: the national forest would protect the reclamation project. Central Arizona thus entered the twentieth century with its agricultural economy dependent on federal lands, resource managers, and national policy.

In a story common throughout the American West, Tonto National Forest's environment detrimentally transformed following the introduction of livestock. Sheep and cattle overgrazed the ranges, destroying native annual and perennial grasses. With weak grass cover, erosion increased, which led to a more erratic and low quality water supply for downstream Phoenix and its environs. Drought and a persistently glutted livestock market added to these problems. From the 1890s to the 1910s, ranchers in Tonto National Forest faced a fatal combination of overgrazing, depression, and drought.

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[3] Perhaps the best general overview of twentieth-century resource management is Charles F. Wilkinson, *Crossing the Next Meridian: Land, Water, and the Future of the West* (Washington DC, 1992). For more specialized studies of the Forest Service, see Stephen J. Pyne, *Fire in America: A Cultural History of Wildland and Rural Fire* (Princeton, 1982; reprint, Seattle, 1997); William D. Rowley, *U.S. Forest Service Grazing and Rangelands: A History* (College Station, 1985); and Hirt, *A Conspiracy of Optimism*.

[4] An extended discussion of this can be found in Adam M. Sowards, "Reclamation, Ranching and Reservation: Environmental, Cultural, and Governmental Rivalries in Transitional Arizona," *Journal of the Southwest* 40 (Autumn 1998): 333–61.

The range provided no relief from the massive introduction of cattle and sheep, so ranchers waited and hoped for better days. The newly created Forest Service offered few answers. In fact, in its first 20 years, the Forest Service did relatively little with the livestock economy besides charging nominal grazing fees for ranchers using the range. By the 1920s, with a rangeland environment thoroughly devastated, Tonto National Forest managers began a new phase of administration that intensified management.

The same year Croxen delivered his "History of Grazing," Tonto National Forest Inspector of Grazing, D. A. Shoemaker, produced an equally important study. In an 18-page report, Shoemaker described the Tonto National Forest's range condition in specific terms, including detailed discussions of carrying capacity, erosion, and even an evaluation of a single successful allotment. Shoemaker's investigation appears to be the first study of its kind for Tonto National Forest; thus, it provides a baseline study useful for comparison. That early records were poor, inaccurate, or nonexistent frustrated Shoemaker. Managers like himself required records of historical use and management to determine the carrying capacity of the range. Without maps, for instance, Shoemaker could not identify the individual ranges in question. Even if the range were mapped accurately, the Forest Service records were notoriously inaccurate, so that a close estimate about the historical, current, or potential carrying capacity was nearly impossible. An exasperated Shoemaker explained, "[I]t would be the height of folly for me to guess the grazing capacity of the Tonto." Consequently, the Inspector of Grazing sought to remedy the paucity of records with his inspection. "We are going to need all such reliable records as it is practicable to get," wrote Shoemaker, realizing the importance of his study for future managers, "in order to know what changes are taking place on the ranges and what adjustments will have to be made."[5] Shoemaker represented the archetypal optimistic and confident figure of the Forest Service ranger, who believed in his organization and the mission of conservation.

Virtually no one outside the industry doubted that ranchers had overstocked the range. Rather, people debated the degree of damage and the methods of reduction and improvement. Shoemaker acknowledged that the ranges were in a "seriously depleted condition from overgrazing" and required anywhere from 20 to 100 percent stock reductions, yet he believed that "[m]ost of the Tonto ranges are yet in such shape as to satisfactorily revegetate under proper grazing use." The ecology of the desert range near Roosevelt Lake and in Tonto Basin was particularly depleted. Because stockmen used the desert range on a yearlong basis, it never had a reprieve. There, Shoemaker recommended a "total exclusion of stock." Shoemaker viewed this part of the upper Salt River Valley and the Tonto Basin as the most damaged and overused portion of Tonto National Forest. The cumulative effects had taken their toll, and, according to Shoemaker, ending all grazing furnished the only hope of restoring a cover of peren-

[5] D. A. Shoemaker to District Forester, Memorandum, 15 May 1926, Folder 2210 Analysis and Plans Permanent Records, Historical, Tonto National Forest Supervisor's Office, (hereafter TNFSO), 18, 25.

nial grasses.[6]

In contrast to the lower elevation desert, the remaining ranges could bear some use, if stocked and managed judiciously. Shoemaker characterized the cattle ranges in the northern and eastern portions of Tonto National Forest as seriously depleted with scant perennials and greatly damaged palatable browse. Unpalatable weeds replaced much of the native species, and heavy erosion took a toll. Despite the prognosis, Shoemaker believed proper grazing methods, such as reduced numbers or only seasonal use, might transform a "seriously depleted" or an "overgrazed" range into a productive grassland. Nature could be trusted to revegetate if the Forest Service ensured the opportunity.[7]

Shoemaker only identified one allotment in the national forest still in "good condition." The Tom Cavness allotment had "satisfactory stands of vigorous, undamaged forage species . . . with palatable forage on the ground at the end of the grazing season." Shoemaker elusively cited "proper livestock and range management" as Cavness's superior method. Moreover, he assured the district forester that, as evidenced by Cavness's example, a profitable and healthy range could be maintained in Tonto National Forest. No environmental condition predetermined the range's deteriorated state; the Tom Cavness example demonstrated otherwise. Unfortunately, sources do not reveal further information concerning Cavness or his methods.[8]

The range, of course, mattered to the ranchers specifically in terms of its forage value, but the forest primarily was created to protect the watershed of the Salt and Verde Rivers. Thus, irrigation eclipsed the livestock industry's interest in the national forest since the Salt River Valley's economy produced nearly $27 million the year before Shoemaker's memorandum. Nevertheless, a plentiful grassland and an effective watershed were linked. Shoemaker argued that managing the range for forage would improve the watershed for irrigation. In his conclusions to the erosion problem, the Inspector of Grazing wrote, "Satisfactory range conditions mean the maintenance of a good stand of perennial forage plants. Therefore, if proper range conditions are had, the erosion-watershed problem is solved insofar as it is practicable to solve it." So with confidence that the Forest Service could reclaim an eroded and degraded rangeland, Shoemaker optimistically concluded his inspection report, fully anticipating that reduced stocking levels would correspond to the range's carrying capacity by 1929.[9] Shoemaker's report reveals a striking emphasis on actively managing the land. He not only identified the poor range and the cattle industry's tendency to overgraze it, but he

[6] Ibid., 13, 30, 14.

[7] Shoemaker classified the Tonto ranges in four categories from worst to best: seriously depleted with no perennial herbaceous vegetation, seriously depleted with a scant stand of perennial sod grasses, overgrazed with a fairly good stand of perennial sod grasses, and good condition. Ibid, 14–5.

[8] Ibid., 15, 24.

[9] Ibid., 27.

prescribed management measures. The systematic characterizations and recommendations were new to Tonto National Forest management. The methodical study created a foundation for future Forest Service management; never again would reports fail to address how to change the range into a usable environment.

Perhaps predictably, Shoemaker's report proved too optimistic. In 1931, the Senior Range Examiner, C. K. Cooperrider, conducted a similar range reconnaissance and found only minimal evidence of range improvement. Grazing by itself was sufficient to change the composition of grass and shrub species. Grasses were both more palatable and more vulnerable. Shrubs lived longer and could withstand the pressures from grazing and other disturbances, but, because shrubs were less palatable, grazing pressure remained almost solely on grasses.[10]

In several areas Cooperrider noted near extinction of grasses. His greatest concern was the loss of perennial grasses that are more palatable, possess deeper roots, and have higher range values. The Range Examiner concluded that where annuals were still established, perennials might regain a foothold. Other areas that had been covered well with grasses were now nearly barren. Nonetheless, Cooperrider believed that the areas could "be expected to improve rapidly if herb regeneration is made possible" by the total exclusion of stock. For many areas, Cooperrider concluded that:

> it is clearly indicated that [the] range has reached a state that requires protection temporarily or indefinitely. It would be most desirable to protect such areas if nothing were involved except future range values. There is no more convincing argument than that the grass depleted areas could range no more than one-fifth to one-tenth the stock carried some years ago.

This statement emphasized several important aspects of the Forest Service and the range. The environment had reached such a poor condition that formal protection seemed warranted. Furthermore, utilitarian or instrumentalist values and not ecological ones clearly influenced the Forest Service's management plans. In addition, the range capacity had diminished in select places by as much as 90 percent. Finally, there is also a hint that Cooperrider recognized the difficulty in reducing use because of ranchers' economic interest in keeping the range stocked. Like Shoemaker, Cooperrider recommended exclusion of domestic animals from several areas. But Cooperrider went further in describing the preference of perennials and their relation to annuals and shrubs. Throughout this and other Forest Service documents, a trend emerged; an examiner evaluated the range looking to improve it for the eventual reintroduction of a more conservative ranching industry. The goal was not wholesale and permanent

[10] For a discussion of grasses and shrubs, see Tony L. Burgess, "Desert Grassland, Mixed Shrub Savanna, Shrub Steppe, or Semidesert Scrub? The Dilemma of Coexisting Growth Forms," in *The Desert Grassland*, ed. Mitchel P. McClaran and Thomas R. Van Devender (Tucson, 1995): 31–67.

exclusion but temporary protection while the range recovered from a half century of heavy overuse.[11]

Besides his concern with range regeneration, Cooperrider demonstrated a keen understanding of the economic realities of ranching in Tonto National Forest. With a range significantly depleted, conservation in ranching practices became a high priority. Yet ranchers still living on and using Tonto National Forest required a certain number of cattle and sheep to maintain their operations. Unfortunately for them, the conservation measures they needed to implement often meant lower livestock numbers that could not sustain their operations; the required reductions would place ranching "entirely beyond the limit of an economic operation." Alternately, the range could not long sustain the number of cattle needed for a successful ranching operation. On this paradoxical situation Cooperrider reported, "Permitted numbers of stock on most of the herb depleted areas has now reached a point that makes a profitable operation with cattle by any known methods of management very questionable, and yet such numbers of stock interfere seriously with revegetation and the control that vegetation will establish." Cooperrider noted the difficulty of addressing such a predicament. In depleted areas, stock was eliminated or substantially reduced to prevent total utilization of available forage. To the rancher, it seemed a waste of forage; to the ranger, it seemed to be sound and necessary conservation.[12]

This dilemma exemplified one of the paradoxes that surrounds the use of public lands in the West. There is private use of the public lands, however, these forest users privatize profits, and the costs of allowing their forest use are socialized through the Forest Service and its congressional appropriations from public tax revenues. That is, public land agencies promote and fund most conservation and rehabilitation efforts, as well as grazing that makes those efforts necessary. The Forest Service understood the plight of the region's cattle ranchers, but its perspective was complicated by trying to balance conservation with a viable stock industry. Cooperrider, like Shoemaker before him, realized that long-term recovery of the range was more important than immediate profits. To be sure, Cooperrider worried about allowing the grazing industry to "kill itself out," which would be more a cultural tragedy than an economic one. But in the same memo, he noted that tourism along the Apache Trail already exceeded the revenue created by the stock industry. That statement was the first in which the Forest Service recognized that an alternative economy might be found in the region through tourism.[13]

By the early 1930s, Tonto National Forest officials finally confronted the range seriously, systematically, and directly. Officials like Shoemaker and Cooperrider spent

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[11] C. K. Cooperrider, Memorandum, 24 October 1931, Folder 2210 Analysis and Plans Permanent Records, Historical, TNFSO, 10, 5.

[12] Ibid., 1.

[13] Ibid., 9.

time surveying the forest and evaluating its condition. With the studies they produced, the Forest Service stood on more solid ground for making management decisions. Since an extensive history of use never had been compiled, managers could not heretofore make sound historical comparisons. The work of Shoemaker and Cooperrider meant managers in the future would have historical documentation of the obvious. The field reports showed that too many cattle still roamed the national forest, and they documented severe overgrazing and erosion on the range. What had been the best grazing lands in the basins of Tonto Creek and the upper Salt River were depleted of cover and prone to extensive erosion. Finally, a systematic evaluation provided the Forest Service with a starting point for management plans and evaluations. Total exclusion seemed the reasonable action for the most deteriorated ranges, but the economic interests still surviving in Tonto National Forest influenced land-use decisions. The Forest Service therefore sought a more sophisticated management strategy. Since total exclusion was not politically or culturally viable, the question centered on means and methods of maintaining grazing.

With watershed priorities still driving the management of the forest, erosion held a prominent place in the management regime. Erosion created significant problems on the range, for it threatened the very reason the Forest Service was there: to protect the watershed of the Salt River Project.[14] For cattle ranchers, erosion meant losing forage to floods. They needed some way to stabilize the soil so that grasses might return. Consequently, when the Depression hit and the Civilian Conservation Corps (CCC) arrived to work, erosion control became a primary goal. Statewide, the CCC employed over 41,000 men and built more than half a million check dams, many in Tonto Basin; physical remnants of these dams still exist there.[15] Fortunately, the Forest Service photographed many of the erosion control projects for study. After a period of eight or ten years, another photo taken from the same vantage point revealed vegetative changes. The photographic record demonstrates the mixed success of the erosion control programs. In some places, improved ground cover helped stabilize the soil; in other locations, no discernible changes characterized the check dam. Often, and to the ranchers' dismay, the vegetation that reclaimed the eroded landscape was unpalatable, such as snakeweed, rendering the range conservation efforts inconstant. The program's mixed results reflected American conservation generally. But if the results could not always be counted on, the effort now could be.

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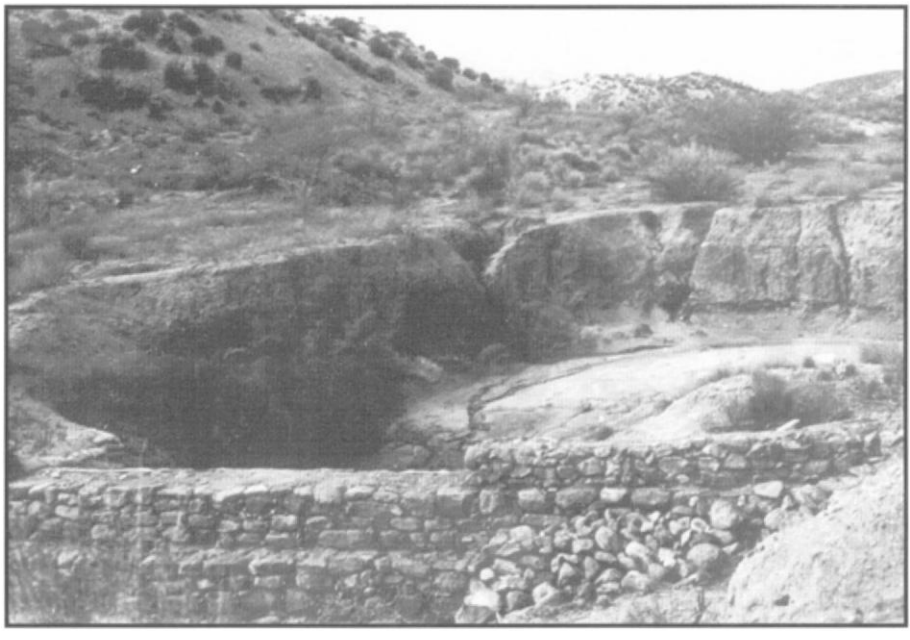
[14] By 1946, six dams had been constructed on the Salt River and Verde River within the boundaries of Tonto National Forest: Roosevelt Dam (1911), Mormon Flat Dam (1925), Horse Mesa Dam (1927), Stewart Mountain Dam (1930), Bartlett Dam (1939), and Horseshoe Dam (1946).

[15] Perry H. Merrill, *Roosevelt's Forest Army: A History of the Civilian Conservation Corps* (Montpelier, VT: By the author, 1981), 109; Thomas E. Wright, *Keeping the Boys Busy: Archaeological and Documentary Investigations of AR-03-12-06-1391, a Civilian Conservation Corps Erosion Control Site in Tonto Basin, Gila County, Arizona: with a Brief Account of CCC Activities on Tonto National Forest Lands and a Suggested Historic Context and Research Issues for CCC Erosion Control Sites on the Tonto National Forest* (Tempe, AZ, 1993).



Check Dam in Tonto Basin near Tonto Creek Civilian Conservation Corps Camp. Photo by George D. Hardaway in 1936. Courtesy of the Tonto National Forest.

So, the late 1920s and early 1930s set the stage for a potential change in management. Tonto National Forest managers had observed the range firsthand, identified problem areas, and made cautious efforts to reverse the environmental decline. But that was insufficient to establish long-term improvements. It took a new forest supervisor to transform the Tonto National Forest by intensifying and initiating many active reforms with a style that led him to confront ranchers directly and to base his decisions more on ecological precepts than on economic ones. F. Lee Kirby, a former inspector of all of Arizona's CCC camps, became the most influential ranger in the history of Tonto National Forest, serving as Forest Supervisor from 1935 to 1946. Kirby's management replaced the previous period's methods that focused primarily on defining the problem and gathering historical data. As Forest Supervisor, Kirby instituted changes, initiated studies, encouraged reductions, and generally sought a more active management role. His biography reveals much of Tonto National Forest management history, as well as Forest Service policy and politics.

Kirby began his Forest Service career in 1909 on the Crook National Forest, portions of which later were included in Tonto National Forest. Early on, Kirby found Gifford Pinchot's vision for conservation and the Forest Service attractive. "I soon saw that the Forest Service policies were something you could honestly believe in," Kirby said in an interview, "because the end purpose was conservation of natural, renewable, life-giving land resources. The end purpose is human welfare." Dedicating his life to

Same Check Dam in 1944. The growth and increase are from protection and planting. Note surface area still mostly bare, suggesting the mixed results of CCC work. Photo by George D. Hardaway. Courtesy of the Tonto National Forest.

the task, Kirby had a major effect on conservation in Tonto National Forest with his understanding of the range coming from time as a ranch-hand and years in the field as a Forest Service employee.[16]

Surviving documents from Kirby's tenure as Forest Supervisor attest to his ability to initiate new programs, educate the public, and rehabilitate the range. Kirby continued fencing test plots to demonstrate how rest or restricted use of the range promoted revegetation. Although he inherited some test areas, he changed some of the criteria for their uses and added new fenced plots, making the program his own. In a 1939 memorandum to the regional forester, for instance, Kirby explained that fencing "raw, badly damaged areas," as was the characteristic practice before his time, concentrated on only the worst circumstances. Instead, he suggested that "it would be wiser to select more nearly average areas, where there is still some top soil and a fairly good remnant of palatable sod grasses to start from. Plots of this kind make a much better showing and provide us with more convincing argument material as to what is possible of

[16] The details of F. Lee Kirby's career can be found in an interview in Edwin A. Tucker, comp., *The Early Days: A Sourcebook of Southwestern Region History*, Book 1, USDA Forest Service, Southwestern Region, Cultural Resources Management Report No. 7 (Washington, DC, 1989): 162–72. See also F. Lee Kirby, interview by Arthur Carhart, 23 February 1963, Conservation Tapes, Conservation Collection, Denver Public Library.

accomplishment [*sic*] in range conservation." Kirby's guidance here reflects his desire to find useful and practical applications for range experiments with an eye toward success and public relations, too. The regional office responded favorably to such suggestions.[17]

In 1943, a memorandum showed another way Kirby sought to reap more from range experiments. Writing to the Pleasant Valley district ranger, the Forest Supervisor explained that the Forest Service established the Pine Creek Plot to determine how well natural revegetation of native grasses would succeed. Instead of focusing only on natural revegetation, Kirby instructed the district ranger to begin experimenting with reseeding, or "artificial restoration." This project used both native grasses such as sideoats grama and nonnative species such as crested wheatgrass. The latter was a common species used throughout the West that eventually proved problematic in its unanticipated growth and spread throughout western rangelands, but that Kirby was using at least some native species is an important innovation. He was unsure his experiments would work, but right or wrong, he wrote, "I would certainly want to know about it."[18] Over twenty years later, Kirby's best hopes were confirmed. In a 1966 article in *Journal of Range Management*, B. Ira Judd reported on the success of various reseeding programs Kirby initiated in the 1940s. Judd indicated that given enough time with an appropriate selection of seed and proper seedbed preparation, one could expect favorable results, and he cited one example where the protected plot yielded plants four times as dense and twice as tall.[19] Kirby's innovations in the 1930s and 1940s provided a legacy of restoration, leading one author in *American Forests* to call him perhaps the "nation's Number One crusader for grass restoration."[20]

But crusading meant more than merely obtaining results on the range. Kirby believed strongly in educating both the ranchers and the public. In his characteristic hands-on approach, he took "individuals on short trips to the areas on which we have clearly already made substantial vegetative gains and point[ed] out to them the living example of what can be accomplished in this way."[21] By taking politicians, ranchers, Forest Service employees, and other interested parties out to the range, Kirby found an

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[17] F. Lee Kirby to Regional Forester, "Memorandum for Regional Forester," 29 August 1939, Folder 2210 Analysis and Plans Permanent Records, Historical, TNFSO, 2; Arthur Upson, to F. Lee Kirby, Memorandum, 12 September 1939, Folder 2210 Analysis and Plans Permanent Records, TNFSO, 2.

[18] F. Lee Kirby to M. R. Stewart, District Ranger, "Experimental Planting as Artificial Revegetation Aid," 22 May 1943, Folder 2210 Analysis and Plans Permanent Records, Historical, TNFSO, 2.

[19] B. Ira Judd, "Range Reseeding Success on the Tonto National Forest, Arizona," *Journal of Range Management* 19 (September 1966): 296–301.

[20] Oren Arnold, "Emergency in Grass!" *American Forests* 50 (June 1944): 282.

[21] F. Lee Kirby to Regional Forester, Memorandum, 25 October 1935, Folder 2210 Analysis and Plans Permanent Records, Historical, TNFSO, 2.

ideal forum for crusading for conservation and became, in a sense, a public environmental historian. On the range itself, neither the damage nor the restoration effects could be cloaked. He recalled how his methods worked, "[W]hen you're talking about the fundamentals, the grass-roots fundamentals, of conservation, nothing takes the place of discussing it right out on the ground where you can be looking at what you're talking about at the time you're discussing it. And it isn't hard to convince them that this is true."[22] With his successful restoration experiments underway, Kirby found much on the range that testified to successful conservation in Tonto National Forest with the potential for more.

Unfortunately, his success became too great. One of the greatest environmental needs and management goals of the Forest Service since its inception had been to reduce livestock numbers on the western ranges. By calling for complete exclusion of stock on some allotments and severe reductions on others, Kirby made significant enemies, including a four-time president of the American National Livestock Association. When he angered too many large stock outfits, Kirby found himself forced out of Tonto National Forest. Ranchers protested the reductions directly to the Regional Forester, Frank Pooler. Bowing to the pressure, Pooler believed that Kirby's reductions were too severe; Kirby felt Pooler could not look the range and the ranchers in the face and make the proper decision to decrease or exclude stock. Kirby recalled the confrontation with Pooler:

> "The trouble with you Mr. Pooler, you just haven't got what it takes to face this. You just haven't got the guts to face this." Well, he wasn't the kind of a man to take that, and I knew it. And he started tearing into me. I said, "Yes, you've just got enough to beat down the ears of somebody who's working for you, but you haven't got it when you're facing this bunch of stockmen."[23]

Soon thereafter, the Forest Service transferred Kirby to a new position created for him in Washington, D.C., to get him out of the Southwest.[24] Thus, regional political and economic interests forced a ranger out of a position and landscape he knew and had worked in for over 35 years, and the Tonto National Forest lost the most dynamic and effective ranger in its history.

It is not an altogether unfamiliar story. Kirby's difficulties with the Forest Service arose because his barometer of change and indicator of management was the land itself. He recognized that the environment did not accommodate political or economic exigencies. So rather than letting the political landscape shape nature, Kirby attempted to allow environmental needs to shape decisions and management goals.

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[22] Tucker, *The Early Days*, 170.

[23] Kirby interview by Carhart, 23 February 1963.

[24] The account of Kirby's transfer is found in William Voigt, Jr., *Public Grazing Lands: Use and Misuse by Industry and Government* (New Brunswick, 1976), 154–61.

He recalled:

> Now, I've had my share of arguments within the Service. "Well Lee, you must realize that everything in the way of legislation and policy is a matter of compromise." Well, we all know that. But my answer has been this, "Okay, if you're selling a house, or establishing a line out there, in nearly everything a compromise is possible. But if you're dealing with the functions of nature, *nature does not compromise*. You play her rules or—and there are plenty of examples in some of the old countries where people abused their land resources—Nature retaliated by bringing about starvation by the millions."[25]

Kirby's vision proved at once apocalyptic and hopeful.

Later Tonto National Forest officials struggled to continue the progress Kirby began with stock reductions. Since the turn of the century, cattle reductions remained crucial to establishing a sustainable ranching industry and range. The discrepancy between permitted use (i.e., the number of animals the Forest Service allowed on the forest) and the estimated grazing capacity (i.e., the ecological limits of the range) was significant. That disparity widened and narrowed over time, reflecting relative successes and failures of conservation measures. Unfortunately, no reliable early numbers exist, and later figures are scattered at best. Piecing together the available evidence reconstructs an incomplete but still useful picture of range use and misuse.

Early accounts placed 150,000 sheep seasonally in the Tonto National Forest region at the turn of the century and 85,000 cattle by 1921, although cattle numbers likely were much higher before the droughts of the 1890s and the first decade of the twentieth century.[26] The early records are also likely to be understated since ranchers claimed fewer cattle in order to pay lower fees. Kirby, for instance, recalled going to a rancher who paid grazing fees for 200 head and claimed 400 total head, with half grazing on the national forest. But by the time Kirby left the ranch later that day, the rancher admitted owning 1,565 head.[27] By mid-century, records became more consistent yet still scattered. Rangers focused on bringing the actual numbers of cattle grazing in Tonto National Forest and the estimated grazing capacity closer together. The key reason for these efforts, of course, was to allow more grass to grow in order to feed more cattle and sheep. Several methods besides mere reduction could be used.

One of the most successful, difficult, and volatile programs the Forest Service sought to implement for improving the range concerned fire. Once ranchers settled in

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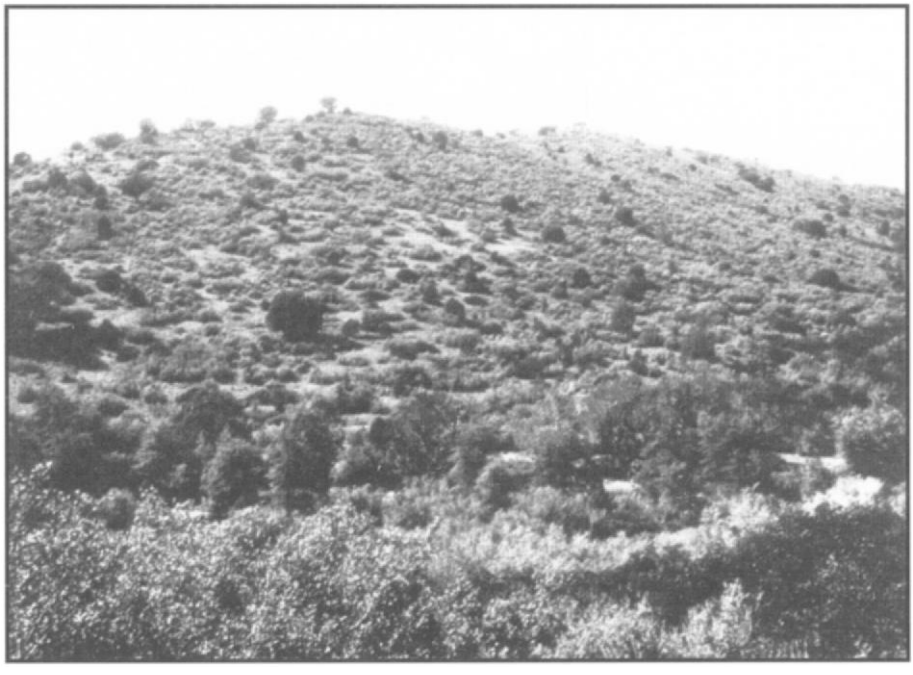
[25] Tucker, *The Early Days*, 172 (emphasis added).

[26] O. A. Turney, "Water Supply and Irrigation on the Verde River and Tributaries," Arizona Collection, Hayden Library, Arizona State University, Tempe(1901), 16; T. T. Swift to Charles L. Davis, 12 December 1924, Salt River Project Archives, Phoenix, AZ; Sowards, "Reclamation, Ranching and Reservation," 338–40.

[27] Incident related in Tucker, *The Early Days*, 166.



Invasion of chaparral on hillside in 1929 that should be covered in grasses. Unknown photographer. Courtesy of the Tonto National Forest.

the region, wildfires routinely were extinguished and anthropogenic fires virtually vanished. In their absence, and combined with the presence of domestic stock, much of the grassland became brushy. Although some understanding of the relationship between fire, grasses, and chaparral (dense brush) existed, the idea that fire somehow ruined the forest and range remained dominant well into the post-World War II period. At the same time, however, research and experimentation in controlled burning gradually loosened the grip of the Forest Service's fire-suppression policy. Tonto National Forest managers sought to use fire to improve watershed yields for the growing urban population in Phoenix. Thus, urban needs prompted a new management strategy. Tonto National Forest was among the earliest national forests to reintroduce fire into the natural environment. The successes and failures exemplify the ambivalence of the Forest Service's fire policy, and they demonstrate the continuing difficulty of implementing and sustaining successful management programs. Moreover, Tonto National Forest's fire history and experience with controlled burns represented how fire works ecologically while often failing in the political realm, for political and physical landscapes are frequently irreconcilable.[28]

[28] Pyne, *Fire in America*.

Historically, chaparral on Arizona ranges remained spotty and in the foothills. Grasslands dominated many of the areas that chaparral eventually invaded. As livestock consumed the perennial grasses, chaparral took advantage of the depleted range and established itself widely. Its density prevented effective reestablishment of grasses. Foresters had written about this landscape transition as early as the 1930s. Thirty years later, the Forest Service attempted to reverse the infiltration of chaparral by reintroducing fire to the rangelands. Fire, applied carefully, could reduce the brush while increasing grasses, even reestablishing perennials.[29] The history of controlled burning in Tonto National Forest, however, is familiar and unfortunate. Tonto National Forest preceded other regional forests in using controlled fire widely, and just as results seemed promising, the program diminished.

Consistent with the Forest Service's historical mission in Tonto Basin, watershed concerns forced experiments with burning. The prevalence of chaparral in Tonto National Forest diminished the effectiveness of watersheds, limited grazing potential, compromised intangible recreational values, and heightened the ubiquitous fire danger. Reflecting these factors, most of the research conducted in the 1960s focused on how to convert chaparral to grasslands, how erosion might be reduced, and how water yields could be increased. Foresters worried about chaparral for other reasons too. Because it is exceptionally flammable, wildfires were inevitable and became difficult to control. Fighting these fires was expensive. Besides watershed concerns, then, chaparral conversion promised to reduce the fire hazard and costly fire control. Consequently, in 1961, and inspired by similar programs' successes in southern California, Tonto Forest Service officials began experiments with burning in Brushy Basin, becoming the "first major prescribed fire treatment of chaparral in the Southwestern Region." About the same time, another successful test area began at the Three-Bar Experimental Watersheds.[30]

Prescribed burning involved several steps. With nearly one million acres in Tonto National Forest covered in chaparral, selecting sites posed no problem. Typically, national forest officials selected areas from 160 acres up to 3,000 acres. Before the main burn, they created firebreaks, established isolated areas of chaparral for wildlife, and

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[29] Department of Agriculture, Forest Service, *Chaparral: Characteristics and Management in Arizona* (Washington, DC, 1975), 3–5; Aldo Leopold, "Grass, Brush, Timber, and Fire in Southern Arizona," in *The River*, ed. Flader, Baird, and Callicott, 114–22.

[30] Details can be found in Joseph F. Arnold, "Uses of Fire in the Management of Arizona Watersheds," *Tall Timbers Fire Ecology Conference Proceedings* No. 2 (1963): 108–10; J. J. Baldwin, "Chaparral Conversion Provides Multiple Benefits on the Tonto National Forest," *Fire Control Notes* 29 (Fall 1968): 8–10; J. J. Baldwin, "Chaparral Conversion on the Tonto National Forest," *Tall Timbers Fire Ecology Conference Proceedings* No. 8 (1968): 203–8; R. E. Courtney and J. J. Baldwin, "Modifying Chaparral Brushland on the Tonto National Forest to Improve Multiple Resource Values," In-service report, 1964, TNFSO, 1–10; and Malcolm J. Zwolinski and John H. Ehrenreich, "Prescribed Burning on Arizona Watersheds," *Tall Timbers Fire Ecology Conference Proceedings* No. 7 (1967): 202–5. Quotation from Baldwin, "Conversion Provides Benefits," 8.

prepared riparian areas carefully. Using diesel and butane torches, electrically detonated devices, and even napalm grenades, foresters ignited chaparral along ridgelines, creating a backing fire down the slope. Then, they ignited the bottom of the slope "for an uphill sweep." Using helicopters 18 months after the burn, officials applied the herbicides 2,4-D and 2,4,5-T as well as others. Combining fire with mechanical and chemical methods seemed crucial to success.[31] Complete with helicopters and napalm grenades, Tonto National Forest resembled a desert Vietnam. The experiments at Brushy Basin and the Three-Bar successfully converted landscapes into grass.

Forester J. J. Baldwin reported the results of Tonto National Forest's success with prescribed burning. "The objective of this project," according to Baldwin, "was to burn the dense chaparral and to convert the area to open Savannah-type grassland, retaining islands of chaparral for wildlife cover." The burn-and-spray experiments succeeded, resulting in increased water yields, changed and improved vegetative cover, as well as improved wildlife habitat. Before burning, an acre yielded approximately 1.5 inches of water; after treatment, an acre could yield up to 6 inches. Brushy Basin had been home to 20 head of wild cattle; by 1967, over 200 domestic cattle grazed there without reaching full capacity. Clearly, there was evidence of improved grass cover. Reducing the dense chaparral also improved deer and quail habitat. Baldwin concluded, "With increased water production and beef production, and reduced fire suppression costs, $3 is being realized for each $1 spent. This analysis does not place an economic value on increased wildlife use, or on use by recreationists for camping, picnicking, and general outdoor enjoyment."[32] This final note indicated that the new, urban constituency formed a central part of the management agenda. Finally, and predictably, Baldwin reported no damage to the land, but he did acknowledge some air quality concerns.

Air quality was a notable concern, especially as the Phoenix metropolitan area became increasingly congested. In 1968, foresters reported the effects of both wildfire and prescribed burning on visibility and pollution in Phoenix from October 1967. The fires were located between 38 and 46 miles from Phoenix. Based on direct observations, only one day during the burning did visibility in Phoenix reach the "very poor" stage. Burning occurred on eleven days in October and visibility varied from excellent to "very poor."[33] Because air quality in Phoenix suffered from pollution normally, the

[31] For herbicide information, see Arnold, "Use of Fire in Arizona Watersheds," 109, 111; Baldwin, "Chaparral Conversion," 204; Baldwin, "Conversion Provides Benefits," 8; Courtney and Baldwin, 2, 8; W. J. Fleishman, In-service report, 29 March 1968, TNFSO; Alden R. Hibbert, Edwin A. Davis, and David G. Scholl, *Chaparral Conversion Potential in Arizona Part I: Water Yield Response and Effects on Other Resources*, USDA Forest Service Research Paper RM-126 (Washington, DC, 1974), 10; Forest Service, *Chaparral*, 49–53. Quotation from Baldwin, "Conversion Provides Benefits," 9.

[32] Baldwin, "Conversion Provides Benefits," 8–10.

[33] "An Analysis of the Effects of Chaparral Prescribed Burning on Pollution and Visibility in the Phoenix Metropolitan Areas," In-service report, TNFSO, 20 September 1968, 3.

Forest Service's prescribed burns escaped notice due in part to their small size. But the Forest Service had to concern itself with the combination of urban air problems and rural fire pollution. In a 1977 Interagency Range Committee Report, authors from the Forest Service and Bureau of Indian Affairs noted the problems of burning in Tonto National Forest and the adjacent White Mountain Apache Reservation in connection with Phoenix's pollution problems. Prescribed burns in those areas required the wind to be moving away from urban centers and needed to receive permits issued from the state's Bureau of Air Quality Control.[34] A bureaucracy complicated, but did not prohibit, prescribed burning. Except for worries about air quality, prescribed burning for fire prevention and chaparral conversion seemed an unmitigated success.

Still, the concerns about air pollution and growing hostility toward pesticide use led to sharp reductions in prescribed burning after 1968 in Tonto National Forest. At the very time direct evidence disappeared from Tonto National Forest documents, the Forest Service's southwestern region produced several studies on prescribed fire and cited Tonto National Forest's success. In a research paper published by the Forest Service in 1974, the authors hailed the Arizona national forest's success, pointing to increased water yields, reduced shrubs, and reestablished grasses.[35] Likewise, papers given at the Tall Timbers Fire Ecology Conferences reaffirmed that Tonto National Forest studies concerning increased water yields, forage improvements, and fire prevention were "very encouraging."[36] With these achievements, one might think all of Tonto National Forest's chaparral could be turned easily into grass.

Several reasons account for the inability of the Forest Service to restore the range to grass. Prescribed fires required permits issued by the State of Arizona Bureau of Air Quality Control. Besides the air quality issues involved, other issues made instituting prescribed burning more difficult and complicated. Controlled burns, for all their benefits, required substantial preparation before the site was ready. To maintain wildlife cover, some chaparral and riparian areas received preburn treatment. Also, in later years, areas in habitats where threatened or endangered species lived required extra precaution. All these procedures meant the process to initiate controlled burns took time and money, resources the Forest Service did not have in surplus. In addition, the fires alone did not kill all the chaparral species. The initial burn killed the aboveground plant, but chaparral would come back without further treatment. Herbicides prevented the return of chaparral, which allowed grass to establish itself. Once grasses were thick enough to carry fire, then the fires themselves prevented a reinvasion of

[34] Charles P. Pase and Carl Eric Granfelt, *The Use of Fire on Arizona Rangelands*, Arizona Interagency Range Committee Publication No. 4 (n.p.: Arizona Interagency Range Committee, 1977): 3.

[35] Hibbert, Davis, and Scholl, *Chaparral Conversion Potential in Arizona*, 15–8, 21–3, 31–3.

[36] Zwolinski and Ehrenreich, "Prescribed Burning on Arizona Watersheds," 204; Joseph F. Arnold, "Uses of Fire in Arizona Watersheds," 109–11.

chaparral. But at the time, the transformation from chaparral to grass hinged on herbicide application and controls on grazing. Eventually, however, herbicide use became infeasible. In the words of one report, "Use of a combination of herbicides for initial shrub suppression and burning offers an effective, if rather expensive, alternative, although environmentalist objections have made this option a politically difficult one."[37] This statement captured the ambivalence of prescribed burning: it worked, it was expensive, and doing it correctly often alienated environmentalists, who might have been a controlled burn program's biggest supporters.

In sum, reintroducing fire proved both more difficult and perhaps more successful than expected. The combination burn-and-spray operations in Tonto National Forest yielded high results for wildlife, the watershed, and forage. Unfortunately, political and health concerns because of herbicides and air pollution prevented widespread use. While and when it worked, however, fire helped improve the range; it reshaped portions of Tonto National Forest and demonstrated that fire management correctly applied could balance the various interests of forest users—forage for ranchers, water for reclamationists, wildlife for environmentalists and recreationists. There proved to be a more fundamental problem in Tonto National Forest and other western public lands that to date has not found a solution. Land managers seek to reintroduce fire as a tool to re-create past landscapes. But fire is not a tool; it is a process. Until the process of routine burning is embraced and employed by public and private land managers, fire problems will continue. And as the national forest moved into the 1990s, the fire problem would encounter more people and more political questions, further complicating the management story.

Since the 1920s, Tonto National Forest officials sought to heed Aldo Leopold's advice and worked to reduce cattle, reintroduce fire, and stop erosion. In each endeavor, they experienced some success. But ironies accompanied each success. Cattle reductions meant the ranching economy no longer occupied the central economic niche in the region; instead, recreation began to predominate. The fire regime had improved forage and water yields, but air pollution and economic constraints—problems outside the control of Forest Service officials—slowed the controlled burn program. Erosion improved somewhat, but it was still a perennial concern; and although the watershed still functioned ecologically as it did formerly, it collected into reservoirs full of recreational boaters. Clearly, by the 1990s, a new cast and scene occupied the Tonto National Forest's landscape.

Today, the forest, while trying to recover from the massive invasions of cattle, sheep, and people between the 1860s and 1920s, has been somewhat restored. Now, rehabilitation measures are for different purposes. In other words, new cultural and natural landscapes in Tonto National Forest exist, so restoration means something different. The Forest Service, designed to administer natural resources for economic purposes, now faces a terrain that has been altered irrevocably by forces that, for

[37] Pase and Granfelt, *The Use of Fire on Arizona Rangelands*, 7.

the most part, do not exist as the primary focus of management anymore. Rather than managing resources, the Forest Service increasingly manages people for their recreational needs.[38] What rehabilitation and conservation mean for those interests remains to be seen and continues to be defined.

In recent years, Tonto National Forest faced a distinct shift in management values and priorities. At the same time, the environmental changes in the forest constitute new forces, suggesting a new era has descended on Tonto National Forest. The Phoenix population boom, the growth of the environmental movement, and the decline of western ranching generally combined to change cultural and environmental circumstances. In this recent context, recreation formed the most prevalent land-use. Rather than managing for work, such as ranching, the Forest Service was forced to manage for play, such as weekend boating on Salt River reservoirs, recreational horseback riding, overnight camping, and second-home development. A significant implication of this transformation is that history no longer carries the same weight for constructing a management plan, since managers who look to the forest's past find ranching, not recreation. This shift reflects a common dilemma for western land managers, making Tonto National Forest again a crucible of change.

Because of the environmental movement's growing power in the 1960s and 1970s and the popularization of the science of ecology, the federal government adopted a number of significant environmental regulations. Most significant among the new laws for the Forest Service were the 1969 National Environmental Policy Act (NEPA), the 1974 Forest and Rangeland Renewable Resources Planning Act (RPA), and the 1976 National Forest Management Act (NFMA). This legislation required national forests to research how potential resource management plans would affect ecological values. Sounding similar to progressive conservation goals of efficiency, all these acts sought to integrate long-range planning with budgetary considerations while paying particular attention to sustainability in multiple-use management goals. NEPA, for instance, required environmental impact statements (EIS) to show how a particular management plan would affect the natural environment. Together, the RPA and NFMA obliged national forests to propose and produce forest plans at regular intervals. These plans describe management issues, summarize forest conditions, and establish long-range planning objectives.[39]

For environmental historians, these EISs and forest plans provide excellent source materials. The Tonto National Forest issued a forest plan in 1985; at the same time, they circulated a *Summary of the Tonto National Forest Environmental Impact Statement*

[38] The National Park Service faces this same challenge. For a critical treatment of this management quandary, see Alston Chase, *Playing God in Yellowstone: The Destruction of America's First National Park* (San Diego, 1987).

[39] Department of Agriculture, Forest Service, Southwestern Region, *Tonto National Forest Plan* (Washington, DC, October 1985), 1. For context, see Hirt, *A Conspiracy of Optimism*, 243–65.

and Forest Plan that detailed the goals for management in a layperson's terms. This policy statement stood out from earlier Tonto National Forest documents. Most conspicuously, recreationists, such as hikers and boaters, figured prominently in management goals, and those who depended on the forest and its resources for more purely economic benefits played a lesser role. The forest plan's mission statement explained, in part, that forest administrators would provide "a quality mix of year-round outdoor recreation experience opportunities for personal enjoyment ranging from developed recreation sites to wilderness experiences."[40] Furthermore, the *Summary* characterized the new type of forest user: "If they cut firewood, the fresh air and exercise is probably as important to them as the economic value of the wood. . . . The Forest substantially enhances the quality of life of residents in the urban communities."[41] As a physical and political illustration, more than one-fourth of Tonto National Forest is now in designated wilderness areas, and that figure does not include the heavily used reservoir sites, which serve as recreation sites but do not bear official "wilderness" status.[42] This rise in recreational demands reflected the post-World War II Sunbelt population explosion. The forest's management direction had to account for nearby urban residents, now its largest constituency. It also emphasized the ubiquitous post-World War II value—quality of life.[43] Figure 1 graphically represents the explosive growth of recreation over the past fifty years and anticipated growth into the twenty-first century.

Undoubtedly, the new importance of urban recreationists, who were, after all, nonresidents in Tonto National Forest, challenged Forest Service administrators. However, the two most visible environmental events of the 1990s were pregnant with meaning for the new circumstances prevailing throughout Arizona, Tonto National Forest, and the western landscape generally. Fires in 1990 and 1996 helped reveal the dynamic environment, the changing meaning behind ecological change in Tonto National Forest, and the challenge of forest management.

In 1990 the Dude Fire, so-called because of its location near Dude Creek east of Payson, Arizona, started when a bolt of lightning struck a ponderosa pine on 26 June 1990. Eventually, this fire killed 6 fire fighters, destroyed 67 summer homes, burned 24,000 acres, and damaged $12 million in timber and related resources.[44] That lightning started a fire in the largest continuous stand of ponderosa pine in the world was typical, but the size of the fire was unusual, as were the deaths and destruction.

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[40] Forest Service, *Tonto National Forest Plan*, 19.

[41] Department of Agriculture, Forest Service, Southwestern Region, *Summary of the Tonto National Forest Environmental Impact Statement and Forest Plan* (Washington, DC, October 1985), 23.

[42] Ibid., 23–7.

[43] Carl Abbott explains quality of life issues and how they dominate much of postwar western politics, in *The Metropolitan Frontier: Cities in the Modern American West* (Tucson, 1993).

[44] Michael Kiefer, "Blaze Star," Phoneix *New Times*, 13–9 April 1995, 13; "Time to Burn," *New Times*, 30 May–5 June 1996, 20.

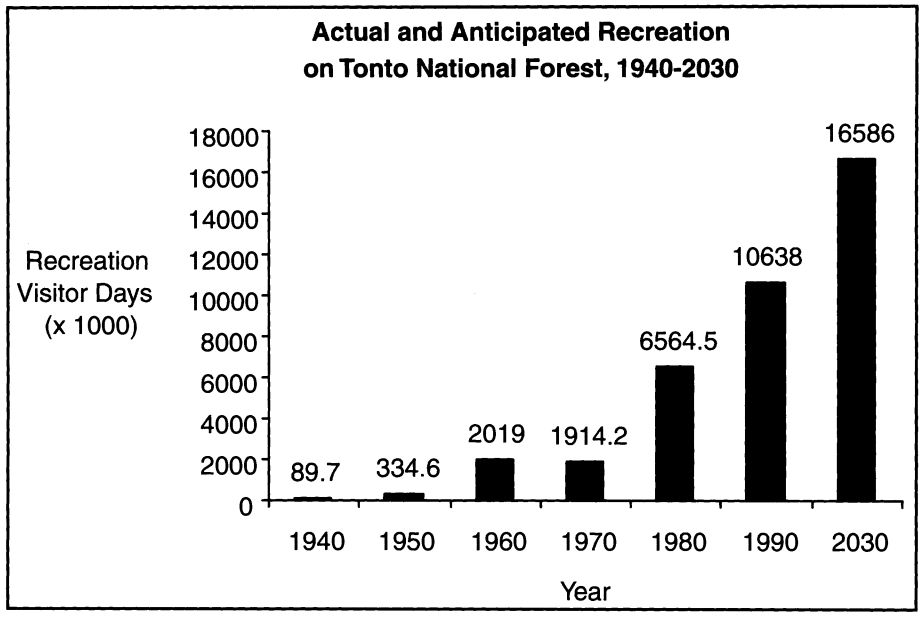

Figure 1. Actual and Anticipated Increase in Recreation on Tonto National Forest, 1940-2030. Sources: Department of Agriculture Forest Service, *Timeless Heritage: A History of the Forest Service in the Southwest* (Washington, D.C.: Government Printing Office, 1988), 133; Forest Service, *Tonto Forest Plan*, 17.

Much had changed in recent years to allow this, particularly economically and environmentally.

Like other western mountain towns, Payson has experienced a real estate boom in the last generation. Many Payson residents come from Phoenix to live during the summer in second homes. These exurbanites often arrive to embrace the forest and its image to escape from their otherwise hectic workaday lives.[45] Before the Second World War, Payson was home to approximately 750 people; by 1974 that number had risen to nearly 3,000, in 1980 to 5,100, and today the population exceeds 11,000.[46] All these newcomers required homes, so developers built into the forest. The transformation of Payson exemplifies the increasing urban, or more properly exurban, focus of Tonto National Forest management and reflects a growing western trend and problem.

But while demographic or physical changes, such as building houses into the forest, could alter its shape, the very meaning of nature had been transformed. This transformation created severe consequences for the people and the forest. In a

[45] Elizabeth A. Carney, "Mental Maps and Frontier Boundaries: The Geography of Tourism under the Tonto Rim in Arizona," paper presented at the 39th Annual Conference of the Western Social Science Association, Albuquerque, April 1997. Copy in author's possession.

[46] Sheridan, *Arizona*, 315; Kathleen Ingley, "Rural Arizona Grapples with Rapid Growth," Phoneix *Arizona Republic*, 5 May 1996, A1, A22–23.

ponderosa pine forest that evolved by relying on periodic fires, a lightning strike is something wanted, even required, for a successfully functioning forest. Building wooden homes with wooden roofs among ponderosa pines is tempting fate, for houses built of forest products burn remarkably like forests.[47]

Had the fire happened a decade or two earlier, property damage would have been minimal, but in 1990 the houses added new fuels to the fire complex of the forest. This new fire complex represented what Forest Service fire managers now call wildland/urban interface fires. This fire type demonstrates the increasing growth of the American West's urban, suburban, and exurban communities. Moreover, it reflects how the population continues to interact more closely with the West's environment. As these trends continue, fire experts believe that the interface fire is the problem fire of the future, and if the Dude Fire is any indication, they are correct.[48]

After the Dude Fire, Tonto National Forest administrators faced a rather daunting task, but they viewed it also as an opportunity. In the following years, the Forest Service produced brochures, colorfully illustrated, to explain prescribed fire and how it helped reduce the fire threat. As one brochure explained, "Like doctors examining a patient, foresters, wildlife biologists, ecologists, and other specialists examine Southwestern forests and grasslands for unhealthy conditions. Fire is one remedy that may be prescribed if trees are too crowded. . . . However, just as doctors must be extremely careful in prescribing medicine, land managers only prescribe fire when conditions are right."[49] The Forest Service sought to communicate in the accessible, if problematic, language of forest health. When the conditions warrant, the brochure explains, prescribed fires are set, and these controlled fires reduce the threat of wildfires to people and property. Another document referred specifically to the Dude Fire: "Many of us live in or near forest environments where wildfires such as the Dude Fire threaten not only the forest around us but our homes and our families. Good forest management, including the periodic use of prescribed fire, reduces the threat of wildfire and keeps the forest around us cleaner and healthier."[50] These publications explained to residents and recreational users of Tonto National Forest why the Forest Service wanted to fight fire with fire. In the 1960s and 1970s, controlled burning experiments were scientific and esoteric; in the 1990s, the Forest Service was trying to make controlled fires household concepts. Unfortunately, a century of fire suppression and Smokey Bear, combined with the memory of lost property and life, proved difficult to counter. Besides, budgets, fire prescriptions, and proper conditions seldom corresponded,

[47] Stephen J. Pyne, *World Fire: The Culture of Fire on Earth* (New York, 1995), 276.

[48] Pyne, *World Fire*, 269–95. See also Pyne, *America's Fires: Management on Wildlands and Forests*, Forest History Society Issues Series (Durham, NC, 1997), 38–40, 46–52.

[49] Department of Agriculture, Forest Service, Southwestern Region, "[Prescription] Fire!" (November 1994).

[50] Department of Agriculture, Forest Service, Southwestern Region, "Prescribed Fire for Healthy Forests: A Management Tool in Arizona Forests," (October 1993).

creating a backlog of places needing prescribed fire. Therefore fuels continued to build up. Whether Forest Service fire managers could burn the range or not, the range conditions required it. In other words, natural and political imperatives were incongruous.

Southwest of Tonto Basin in the vicinity of the Four Peaks Wilderness Area a fire was started by hikers at the Lone Saddle Trailhead on Saturday, 27 April 1996. In that area chaparral dominated the low elevations, while ponderosa pines occupied higher ground—all highly combustible vegetation. High winds carried the wildfire rapidly; by Monday, the burn covered over 35,000 acres and more than 300 fire fighters were on the scene. Estimates placed the cost of fighting the fire near $500,000 a day. A switch in wind direction helped slow the fire on Tuesday, but the relief was fleeting, for high winds returned Wednesday, bringing the five-day total to 42,000 scorched acres. Nearly 700 fire fighters, imported from all over the West, fought the fire. Some flames reportedly reached 80 feet high. On the fifth day of fighting the Lone Fire, a Forest Service "incident commander" humbly stated, "Based on the complexity of the fire, and its behavior, and the weather we're anticipating, it's gotten beyond our capabilities."[51] By late Friday, fire fighters contained the blaze. A little more than 61,000 acres had burned.[52]

The fire's greatest effect on the region's inhabitants proved to be its urban connection. Indeed, most people required the contextual counterpoint of an urban metropolis to understand the Lone Fire. By way of illustration, the *Arizona Republic* placed a map of the Phoenix metropolitan area alongside its article regarding the fire. Juxtaposed on the map was a red circle meant to represent how the Lone Fire compared in size to Phoenix. Beyond the journalistic overlay, the fire did have real connections to Phoenix in the smoke that moved through the atmosphere. As in the 1960s, the smoke contributed directly to air pollution problems in Phoenix. The cover of smoke forced Sky Harbor International Airport to reroute fire-fighting aircraft and to guide planes in with instruments rather than visually, which slowed air traffic considerably. In addition, the smog cover in Phoenix exacerbated already poor air quality. Schoolchildren stayed indoors at recess on the worst days, and those with respiratory problems never

[51] Jeff Whitney as quoted in Judi Villa, "Disaster Pros Join Fight as Inferno's Size Grows," *Arizona Republic*, 3 May 1996, A1.

[52] This recapitulation was reconstructed using the following reports: Pamela Manson, "Wildfires Char Thousands of Acres Across Arizona," *Arizona Republic*, A1, A8; Chuck Hawley, "30,000 Acres Burning: Wildfire Snuffs Ponderosas around Four Peaks," *Arizona Republic*, 30 April 1996, A1, A4; DeWayne Smith, "Winds Help Slow Spread of 'Lone' Fire," *Arizona Republic*, 1 May 1996, A1, A6; Mark Shaffer and Judi Villa, "'Lone' Fire Worst in State in 25 Years," *Arizona Republic*, 2 May 1996, A1, A15; Villa, "Disaster Pros Join Fight," A1, A16; Clint Williams, "'Lone' Fire 'Under Control': Bruce Babbitt Among Those Battle Blaze," *Arizona Republic*, 4 May 1996, A1, A25; Dennis Wagner, "The Beast Took a Limited Toll on Humans," *Arizona Republic*, 5 May 1996, A1, A6; Steve Yozwiak, "IF A WILDERNESS COULD WEEP: Four Peaks' Lush Ponderosa Pine Forest Now an Apocalyptic Landscape of Ash, Memories," *Arizona Republic*, 7 May 1996, A1, A6.

ventured out in the "gray haze and acrid odor over the Valley of the Sun."[53] Phoenix residents understood the Lone Fire from their urban vantage point. Unfortunately, from an environmental perspective, an urban metropolis held few clues to the ecological function and importance of the nearby national forest.

On the final day of front-page coverage, the *Republic* ran two pictures of Four Peaks—one from the previous spring, one following the burn. Above the photographs, a headline in all capitals read: "IF A WILDERNESS COULD WEEP." The doom asserted in the article was most poignant as it related to two nine-year-old children who had visited Four Peaks the year before and found Edenic perfection. Now, following the fire, it was "nature's cemetery" to them. The children could not return; in the words of one girl, "We were planning to go up there again. Now we can't, and nobody else can enjoy it."[54] The Lone Fire was the place where two little girls' dreams of nature died. For Phoenix residents, the girls' feelings encapsulated everything: their wilderness playground had been charred.

During the week in 1996 when 61,000 acres of Tonto National Forest burned, the issue of appropriate land-use captured journalists' attention, and that of politicians, the Forest Service, and Tonto Basin's ranching community. Predictably, reactions were mixed. Some expressed surprise, others anxiety, while others thought of it nonchalantly. All parties, however, used the Lone Fire as a symbol for their own purposes—an emblem of destruction or life, of what was wrong with Forest Service policy or what was wrong with public perceptions. Like the smoke that clouded Phoenix, the Lone Fire's immense size obscured how normal, how predictable, such a fire actually was, given the recent environmental history of the West. The human history of Tonto National Forest created the script for this fire, and the natural history of the landscape demanded it.

The history of the Tonto National Forest since the 1920s offers instructive lessons of natural resource management, environmental change, and history. Environmental and western historians' frequent accounts of ecological decline and federal agencies' complicity simplifies the West's environmental past. If Forest Service managers proved unable to achieve their goals, it was not always for a lack of trying. Since the early part of this century, resource managers had studied the past to find clues to improving the range resources. Certainly, they embraced economic values that might compromise some ecological values, but many managers, such as F. Lee Kirby, genuinely hoped to balance economic and environmental needs. That they did not always accomplish

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[53] Shaffer and Villa, "'Lone' Fire Worst in 25 Years," A1; Villa, "Disaster Pros Join Fight," A16; Pamela Manson, "Wildfires Char Thousands of Acres Across Arizona: Slurry Load Dumped on S. Phoenix," *Arizona Republic*, A1; Chuck Hawley, "30,000 Acres Burning: Wildfire Snuffs Ponderosas around Four Peaks," *Arizona Republic*, 30 April 1996, A1, A4. Quotation from David Cannella and Richard Ruelas, "Drifting Smoke Causes Ills, *Arizona Republic*, 30 April 1996, A1.

[54] Yozwiak, "IF A WILDERNESS COULD WEEP."

what they set out to points to entrenched economic and political interests, as well as the imperfect science of forestry and range management. By the 1980s and 1990s the Forest Service reached their goals of aligning potential and actual carrying capacity. Ironically, as their management strategies succeeded, their constituency changed, rendering their management imperatives more or less obsolete.

Today, most urban residents who frequent the forest have no experience with agriculture, and because cattle can ruin the view and often much of the land, many visitors wish ranching were halted. Thus, a rivalry has developed in the late twentieth century in which the Phoenix faction desired the Tonto National Forest residents to change their economic livelihood. Interregional competition is no longer so much for resources, as it was near the turn of the twentieth century. Now, the respective groups grapple over the appropriate use of the space or the most desirable economy. As the Phoenix economy continues booming and the population keeps expanding, pressure on Tonto National Forest will increase. Today, wilderness and nonagricultural development pay better than cattle or sheep ranching. Therefore, the ranchers who once dominated the region will continue to lose their economic dominance, lands, and way of life. This is nothing new for them or for the West. Time and again, urban interests and political power have dominated rural residents and the resources on which they depend.[55] The environmental questions land managers must increasingly ask will be directed toward Phoenix, leaving the national forest to be managed without reference to its past, which surely makes for an unclear future.

[55] Sowards, "Reclamation, Ranching and Reservation," 355–6.