






THE FIRST FIVE:

A Brief Overview of the First Reclamation Projects
Authorized by the Secretary of the Interior
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BUREAU OF RECLAMATION
FIRST FIVE PROJECTS

-  MILK RIVER
-  NEWLANDS
-  NORTH PLATTE
-  SALT RIVER
-  UNCOMPAHGRE



While Frederick Jackson Turner might have declared that the frontier was at an end in 1893, countless lands within the American West had not yet been reclaimed or made productive. In the last quarter of the nineteenth century, the federal government surveyed the country in the western states and territories, examining potential diversion and storage sites while calculating irrigable acreage. The U.S. Geological Survey estimated that 30 million acres could be irrigated, but by 1890, only 3.6 million acres were being farmed. Because of the vision of certain individuals who knew that for America to reclaim its arid Western lands required the involvement of the national government, the fertile acreage in the Salt River Valley in Central Arizona, the lands in western Nevada, the valley of the North Platte River in Nebraska and Wyoming, the farmers along the Milk River situated in northeastern Montana, and the region along the Uncompahgre River in Colorado, would have the necessary water to promote and sustain growth. This is a brief overview of the first five projects authorized by the Secretary of the Interior under the National Reclamation Act from their beginning, to their place today in the settlement of the West.

John Wesley Powell, Civil War general, explorer of the Grand Canyon, surveyor of Western lands, and head of the U.S. Geological Survey, believed that the federal government should reserve lands for the small family farmer and assist in the development of irrigation projects. Powell wanted the settlement of the West to be in the hands of the individual homesteader even though it would require support by Washington, yet not all the lands were still available; land speculators claimed much of the potentially good farm acreage. But neither the early small landowning farmer, nor the land developer, or the eastern entrepreneurs, had the necessary resources to finance the construction of dams to store additional water to reclaim the

western lands. In his report on arid lands, Powell wrote that he considered the character of the lands themselves, the engineering problems, and suggested, “legislative action necessary to inaugurate the enterprises by which these lands may eventually be rescued from their present worthless state.”¹

Promoters of western irrigation, including the influential National Irrigation Congress, maintained that the federal government should be involved in developing the arid lands. George Maxwell, a leading spokesman for the national irrigation movement and a believer that settlement of western lands by yeoman farmers would solve the social ills of the eastern urban centers with the movement of the population, met with Frederick Newell, chief hydrographer with the U. S. Geological Survey. Newell, a protege of John Wesley Powell, surveyed the arid lands of the West and understood the plight of the homesteader who could not get enough water to irrigate his lands and grow crops to support his family. Maxwell and Newell met frequently with Wyoming Senator Francis E. Warren and Nevada Congressman Francis G. Newlands to devise a plan so that the government could sponsor federally funded water projects.²

At the turn of the century many in Congress realized that without the support of the national government, settlement of additional lands in the West would not be possible; various congressmen supported a reclamation act which would provide federal monies to construct irrigation works and further the development of the arid lands. Yet, it was not until after the assassination of President William McKinley and the ascendancy of Theodore Roosevelt to the

¹John Wesley Powell, *Report on the Lands of the Arid Region of the United States: With a More Detailed Account of the Lands of Utah*. Edited by Wallace Stegner. (Cambridge: Belknap Press, 1962), 8.

²Karen L. Smith, *the Magnificent Experiment: Building the Salt River Reclamation Project, 1890-1917*. (Tucson: University of Arizona Press, 1986) 17-18. Karen L. Smith, “The Campaign for Water in Central Arizona, 1890-1903,” *Arizona and the West* 23:2 (Summer 1981): 136-137.

presidency did Congress enact the National Reclamation Act. The statute, by authorizing the use of federal money from the sale of public lands, would make extensive areas of the West suitable for irrigation, provide homes for America's citizens, increase the agricultural production of the nation, and "make beneficial use of two of its national assets, land and water."³

Although the National Reclamation Act was not signed until June 17, 1902, the engineers prior to its passage had already investigated the Western landscape for potential dam sites and irrigable farm lands. After the measure's enactment, the engineers of the U. S. Geological Survey and then the newly created U. S. Reclamation Service prepared a list of potential projects for the Secretary of the Interior to authorize. The Reclamation Service considered certain criteria, such as water supply, storage facilities, alignment of canals, and selection of feasible lands. While the engineers usually required several years of study to make these necessary determinations, the western settlers were eager to begin the work of reclaiming the land and wanted projects announced as soon as possible.

The Reclamation Service, aware of the current circumstances, recommended certain projects that could be clearly defined with the costs and results estimated. As early as 1889, John Wesley Powell had explored the arid lands of the West, noting potential storage dam sites and the fertility of the land. Fellow geological engineer and later official in the Reclamation Service, Arthur P. Davis surveyed the land in the West by the turn of the century. With this background in place, it would not take long for the first projects to be selected by the Secretary of the Interior.

³U. S. Department of the Interior, *Federal Irrigation Projects*, (Washington: Government Printing Office, 1926), 1.

On March 7, 1903, Charles D. Walcott, Director of the U. S. Geological Survey recommended the first five projects to the Secretary of the Interior: Sweetwater (North Platte) situated in Wyoming and Nebraska, Milk River in Montana, Truckee (Newlands) in Nevada, Gunnison (Uncompahgre) located in Colorado, and the Salt River Project in Central Arizona. On March 14, 1903, Secretary Ethan A. Hitchcock concurred with the suggestions, stating that the Reclamation Service should concentrate its efforts upon these five projects, secure the lands needed for the dams, reservoirs and appurtenant irrigation works, negotiate with current owners of irrigable lands, and prepare contracts for the construction of the reclamation works.⁴

Each project presented both unique conditions while being similar in other respects. All five projects contained both private and public lands. A few projects had some irrigation works, while others needed the construction of storage dams to provide the additional water supply as well as canals and ditches to bring the water to the land. Towns and communities were created within the reclamation projects while the opportunity for others to grow and become major cities became a reality. By examining individually the first five projects, we can appreciate the impact of the National Reclamation Act on Western America.

THE FIRST FIVE

Newlands Project (Truckee)

Is it any wonder why the Newlands Project was selected by the staff of the Geological Survey, considering the National Reclamation Act was sponsored by Nevada's congressman, Francis Newlands and the work already done in the state by government and private engineers?

⁴U.S. Bureau of Reclamation, *Bureau of Reclamation Project Feasibilities and Authorizations*, (Washington: Government Printing Office, 1957), 5-15.

Even though the money available from Nevada's reclamation fund was the smallest of all the western states and territories, the need was great. At the turn of the century, farmers irrigated approximately 500,000 acres throughout the state, but the potential was limited because a few settlers and cattlemen controlled much of the land around the water sources. The Humboldt, Truckee, Carson, and Walker streams provided most of the water during the winter months, but water storage was necessary for the reclamation of the desert lands year round.⁵

As early as 1860, ranchers arrived in the Lahontan Valley in northwestern Nevada and gradually started to farm, with cultivated land reaching 5,000 acres by 1880. The Powell Irrigation Survey examined the resources in Nevada, indicating that the Truckee River could be diverted through a canal to the Lahontan Valley, but beyond this study no viable action was taken. At approximately the same time, Francis G. Newlands, son-in-law and trustee of the William Sharon estate which held extensive acreage in Nevada, moved to Carson City and started to acquire his own land along the Truckee River in 1889. Newlands expanded his holdings and commissioned surveying parties to examine reservoir and canal sites; the entrepreneur also used reclamation as an issue in his bid for political office. Between 1899 and 1900, L. H. Taylor, an engineer and director of the University of Nevada Agricultural Experiment Station, investigated a number of reservoir locations and after the passage of the Reclamation Act, surveyed additional sites, including those along the Carson and Truckee rivers. Rainfall in

⁵Southern Pacific Company, "Truckee-Carson Irrigation Project, Nevada," 1914. Informational brochure extolling the virtues of the Newlands Project.

the Carson Sink Valley averaged approximately six inches a year, not enough to provide a stable water supply without the construction of storage reservoirs.⁶

The initial irrigation structures of the project designed by the reclamation engineers included the earthen Derby Diversion Dam on the Truckee River, the thirty-one-mile Truckee Canal, with a carrying capacity of 1,200 to 1,500 second feet, the Carson River Diversion Dam and a distribution system of canals and laterals carrying water to the farm units. The original plan for a storage dam on Lake Tahoe was halted by the property owners along the lake fearing the water levels would fluctuate greatly, so federal engineers constructed the Lahontan Dam and Reservoir in 1911. A legal settlement was finally reached with the Truckee River General Electric Company concerning storage of water at Lake Tahoe and the federal engineers proceeded with construction of a dam on the lake. As part of its work to insure the productivity of the lands, the Reclamation Service constructed a network of drainage ditches to prevent alkali damage to the land and crops from the rising groundwater level.⁷

With the designation of the Newlands project as one of the first projects, changes occurred that could only happen when enough water is available. Prior to its selection as a reclamation project, Churchill County, being the slowest growing county in the state, contained only 830 people within 4,883 square miles, but within ten years, Fallon, the county seat, boasted a population of 1,000 people alone in 1913. The community, which had originally served as a supply depot for the nearby mining districts, experienced real growth and a building boom. The

⁶For a detailed history of the Newlands Project, see John Townley, *Turn This Water Into Gold: The Story of the Newlands Project*, 2nd ed. (Reno: Nevada Historical Society, 1998). This citation see pages 4, 9. U.S. Reclamation Service, *First Annual Report of the Reclamation Service*, (Washington: Government Printing Office, 1903), 227-28.

⁷ U.S. Dept. of the Interior, *Federal Irrigation Projects*, 36.

town increased in size from those working on the reclamation structures, to supplying the engineers with needed livestock and equipment, to new homesteaders eager to farm the land with the developed water; by 1926, Fallon's residents doubled to 2,000. Residents of Fallon were supplied electricity produced by the Lahontan hydropower plant under contract to the city by the Reclamation Service. The system had grown to such an extent that eighty-five percent of possible customers were receiving power from the reclamation project.⁸

By the mid-1920s, alfalfa was the principal crop, still providing for the original livestock industries focused on cattle, sheep, and hogs, while dairy farms started to make an ever growing appearance in the region. Farmers also grew wheat, barley, potatoes, sugar beets and garden truck with celery and cantaloupes harvested for commercial businesses. With the assurance of a stable water supply for growing sugar beets, the Hinze Brothers of California organized the Nevada Sugar Company in 1910 and opened a factory in the center of Fallon, providing new opportunities for the farmers and factory workers.⁹

The acreage on the Newlands Project encompassed over 200,000 acres and boosters, including the Central and Southern Pacific Railways which owned approximately 10,000 acres, expected to have all that land farmed. Within ten years of the selection of the Newlands Project, however, farmers irrigated just 43,000 acres and that amount increased to only 45,000 a decade later despite water right applications having been filed for 70,000 acres in 1923. While at least

⁸Southern Pacific Company, "Truckee-Carson Irrigation Project." U.S. Dept. of the Interior, *Federal Irrigation Projects*, 36. Mary Ellen Glass, "The Newlands Reclamation Project: Years of Innocence, 1903-1907," *Journal of the West* 7:1 (January 1968) 57. Churchill County Chamber of Commerce, *Resources of Truckee-Carson Project and Churchill County, Nevada*, c. 1914, 29.

⁹U.S. Dept. of the Interior, *Federal Irrigation Projects*, 36. Churchill County Chamber of Commerce, *Resources of Truckee-Carson Project and Churchill County, Nevada*, 19-20.

half the farm land held was in private ownership, the remaining public lands were open to homestead entry, providing opportunities for new settlers.¹⁰

Uncompahgre Project (Gunnison)

First described by Captain J.W. Gunnison in 1853, “as a desert unfit for cultivation and inhabitation only by savages,” the southwestern Colorado territory attracted new people beginning with the westward movement of miners. The Ute Indians were forced to give up their lands between 1868 and 1881 and relocate to the Utah Territory, while their home lands opened to the public for settlement. With the development of the mining industry and the necessity for foodstuffs to be near at hand, enterprising farmers seized the opportunity to move into the Uncompahgre Valley and construct ditches, diverting water from the Uncompahgre River to irrigate the crops; the first shipments of hay were delivered to the mines.¹¹

The valley contained approximately 175,000 acres of irrigable land and the new settlers believed the river contained enough water for the fertile acres. In the early 1880s, the immigrants formed several canal companies, including the Montrose and Uncompahgre Ditch Company and the Delta Ditch Company, constructing over 110 ditches and 475 miles of canals. Besides providing water to the farm lands, a number of these companies delivered water to the burgeoning towns. As was typical in many western regions, the farmers and canal companies over estimated the amount of land that could be irrigated by the 1890s, putting only 30,000 acres

¹⁰Southern Pacific Company, “Truckee-Carson Irrigation Project.” U.S. Dept. of the Interior, *Federal Irrigation Projects*, 36.

¹¹U. S. Reclamation Service, “Project History: Uncompahgre Valley Project 1901-1912,” vol. 1, 4-5. Typescript. U. S. Bureau of Reclamation, *Uncompahgre Project*, 1994. Internet version. U. S. Reclamation Service, *First Annual Report*, 134.

under the plow. Water was in short supply, especially during the summer growing season and there was not enough to irrigate the agricultural lands.¹²

The farmers started looking elsewhere for an additional water supply, at first considering taking water over the divide from the Cimarron River. Then in 1890, F. C. Lauzon conceived the idea of building a tunnel from the Gunnison River to the Uncompahgre Valley. Although the U.S. Geological Survey conducted a reconnaissance survey of this project, the implementation of any plan involving the construction of a tunnel was beyond the means of the people in western Colorado. The Colorado Legislature was approached about assisting in this project and in 1901, the scions set aside \$25,000 for the construction of the tunnel. That same year, Frederick Newell allocated \$4,000 to survey the tunnel and canal location. The Geological Survey mapped the region as well as conducted several additional surveys, including the geologic structure of the tunnel route and the elevations of the region. The State of Colorado started construction on the tunnel in the fall of 1901, but the project was abandoned due to lack of funds.¹³

On Secretary of the Interior Ethan Hitchcock's initial list of five projects was the Gunnison Project. Beyond the initial expenditures made on surveying possible irrigation sites in southwestern Colorado, Walcott may have had other reasons for suggesting the Uncompahgre Valley as the location of one of the first reclamation projects selected. Congressman James Shafroth of Colorado, besides being a member of the House Committee on Irrigation, met extensively with Representative Newlands, Senator Henry Hansbrough of North Dakota, and

¹²U. S. Reclamation Service, *First Annual*, 134. U. S. Reclamation Service, "Uncompahgre Valley Project: Project History 1901-1912," vol. 2. U. S. Bureau of Reclamation, *Uncompahgre Project*, 1994.

¹³U. S. Reclamation Service, "Project History: Uncompahgre Project," vol. 1: 6, 9. U. S. Reclamation Service, *First Annual Report*, 137.

Senator Warren and Congressman F. W. Mondell of Wyoming, following President Theodore Roosevelt's decision that reclamation would be a priority in his administration. While Shafroth initially introduced his own reclamation legislation, he worked with these men on a Congressional conference committee that eventually drafted the measure that became the National Reclamation Act; Shafroth was also the floor manager of the House when the Newlands bill came to a vote in Congress.¹⁴

To supplement the flow of the Uncompahgre River, the federal engineers used the original plan of diverting the Gunnison River by a tunnel six miles in length and a canal almost twelve miles long. The Reclamation Service started work almost immediately and over the next several months the government acquired the rights to the tunnel, although it took several years before the arrangements became final. Under the aegis of the Reclamation Service, contractors began digging the tunnel, but within a year, the builders went bankrupt and the federal engineers continued to direct the crews on the project, having to change the location of the tunnel. As a testament to the engineering efforts, a model of the Gunnison tunnel was prepared and shown at the St. Louis exhibit in 1904 and President William Howard Taft was the guest of honor at the grand opening ceremonies for the Gunnison-Uncompahgre Tunnel on September 23, 1909. During the ensuing decades, the Reclamation Service built additional diversion dams and either purchased private canals or constructed new ones, totaling approximately 470 miles, to bring the

¹⁴Donald Pisani, *To Reclaim a Divided West*, (Albuquerque: University of New Mexico Press, 1992), 312. According to Frederick Newell's diary, he met with Shafroth and other legislators in 1900 to discuss federal reclamation. Frederick Newell, "Autobiography," typescript, University of Wyoming, American Heritage Center, [61, 65].

water to the project lands. In 1932, the Uncompahgre Valley Water Users' Association accepted control of the project from the federal government.¹⁵

When the Uncompahgre Project was authorized in 1903, the reclamation engineers estimated that approximately 171,000 could be irrigated, with 116,000 acres being already in private ownership and about 43,000 open for reclamation homestead entry. As construction continued on the irrigation works, water was delivered as soon as the Gunnison tunnel was completed. Although the epigram of Charles Dana Wilber that "rain follows the plow," was part of the Myth of the Garden in the nineteenth century Great Plains, in the West where there is water people will come, is a truism. The population of the Uncompahgre Valley grew as well as the cultivated lands. The population in the Uncompahgre Valley was 5,171 in 1912 with 3,464 living on the project farms, which increased to over 6,000 in 1923. In 1913, the Uncompahgre Project canals delivered water to 37,000 acres while the private irrigation structures transmitted water to 13,600 acres. While the major crops were alfalfa, potatoes, oats, wheat, sugar beets and apples, the Project Engineer suggested the farmers' diversify their products to include dairy stock, as well as better prepare the soil, acquire better seed, and improve the methods of water delivery and use. Within the next decade, the acreage increased to 64,180 acres irrigated within the project.¹⁶

¹⁵Acting Director, U.S. Reclamation Service to Secretary of the Interior, July 6, 1903. National Archives, Denver, Record Group 115, Entry 3, Box 987. David Clark and William Joe Simonds, "Uncompahgre Project," U.S. Bureau of Reclamation, 1994. Internet version.

¹⁶Fred D. Pyle, "Uncompahgre Valley Project," report to the Uncompahgre Valley Water Users' Association, Feb. 3, 1914. National Archives, Denver. U.S. Department of the Interior, *Federal Irrigation Projects*, 21. Clark and Simonds, "Uncompahgre Project."

Milk River

As in most western territories, farming in the Montana region saw little activity until the 1860s, although limited agriculture occurred earlier near the fur trading posts. The gold miners rushing to stake and work their claims did not want or have the time to till the soil for vegetables and grains, requiring the need of others to provide those commodities. Farmers soon came to cultivate the land and construct small water delivery systems. Although the Milk River Valley in northeastern Montana receives approximately 20 inches of rainfall, irrigation was a necessity. The communities of Chinook and Harlem developed canal systems with a communal diversion dam, as did the Bureau of Indian Affairs for the Assiniboine and Gros Ventre tribes on the Fort Belknap Indian Reservation. By the turn of the century, farmers irrigated 35,000 acres, growing oats, vegetables and pasturage for livestock. But without a stable water supply, the economic growth of the region could not be assured.¹⁷

Under the instructions of Frederick Newell, Geological Survey Engineer Gerard H. Matthews studied the feasibility of diverting the water from the St. Mary River to the Milk River in 1900. The engineers determined that with the construction of a gravity canal between the two rivers, it was possible to transport water from one river to the other. Cyrus Babb continued the survey of the region, investigating various diversion points and identifying what lands needed to be withdrawn. Eventual plans depended, however, on an agreement between the governments of Canada and the United States, because the waters of the St. Mary River traveled through Canada before returning to the United States. Although a treaty would not be reached for almost a

¹⁷Rolla L. Queen, *Historic Cultural Resources of the Milk River Project*, vol. 1: History and Resource Overview. USBR, 1991, 32-34.

decade, the Reclamation Service suggested that the Milk River Project be among the first approved. The waters of the Milk River Project also created problems within the continental United States when, as requested by the Reclamation Service, a determination of water rights was set in motion in 1905. The U.S. Supreme Court, in deciding the case of *U. S. v Winters* in 1908, established the Indian and federal reserved rights doctrine, followed by today's judicial system.

Although it is not clear why the Milk River Project was among the first chosen, the United States government may have wanted to protect the water supply of the Milk River from overuse by the Canadian farmers or possibly guarantee it as a stable source of water for the Indians on the Fort Belknap Reservation. In his autobiography, Newell noted that the Milk River Project had "international complications," and like the other first projects, he was instrumental in sending out the engineers to survey potential reservoir sites and alignments for canals.¹⁸

The Reclamation Service engineers designed a system of irrigation canals and dams which would delivery water to the farmers for the irrigation of 120,000 acres. Beginning with the construction of Lake Sherburne Dam, the stored water would be released into the St. Mary River before being diverted into the twenty-nine mile long St. Mary Canal and then discharged into the Milk River. The water continues to flow northward into Alberta, Canada before re-entering the United States, traveling more than 200 miles where it is stored in the Fresno Reservoir until it is needed by the farmers, proceeding through a series of diversion dams having journeyed through 200 miles of canals, 219 miles of laterals, and 295 miles of drains.¹⁹

¹⁸Newell, "Autobiography" [67].

¹⁹Wm. Joe Simonds, "Milk River Project," U.S. Bureau of Reclamation, Internet version. U.S. Water and Power Resources Service, *Project Data*, (Denver: Government Printing Office, 1981), 632-633.

As construction of the engineering features continued through several decades, settlement of the lands progressed slowly. Even though there was no formal opening of the Milk River Project by the Secretary of the Interior for many years, the Reclamation Service allowed World War I veterans to file entries on the public lands in 1920. During the next decade, landowners with large holdings were not eager to divide their land into the smaller units as required by the Reclamation Act, hindered development on the Project. New farmers also had a difficult time adjusting to the farming conditions and many left within the year after planting their first crop. Those that remained produced good yields of grains, hardy vegetables, and alfalfa, which supported the local livestock industry.²⁰

Throughout the Montana drought of the late 1920s, and the Dust Bowl of the 1930s, the Milk River Project acted as haven for those farmers who lost everything. The federal government assisted in relocating the ‘dry land farmers’ who had tried to make a living in other parts of Montana and Texas and Oklahoma settlers who saw their lands blown away. The Bureau of Reclamation still supported the small farmer with making a living and settling the arid West.²¹

North Platte

When the early fur trappers and traders traveled through the North Platte Valley seeking the beaver in the first decades of the nineteenth century, they were among the first Euro-Americans to visit the region west of the 100th meridian. The trails they helped blaze led the later immigrants across the land to the northwest territories and established the first trading posts at

²⁰U.S. Dept. of the Interior, *Federal Irrigation Projects*, 30.

²¹Simons, “Milk River Project.”

Fort Laramie and Fort Casper in the Wyoming region. Following in the wake of the pioneers, who crossed the prairies to the green lands of Oregon and Washington, were the cattlemen who saw the open range as the space necessary for their livestock. But within the last two decades of the nineteenth century, homesteaders decided to stay in Wyoming and Nebraska, fighting the cowmen, the blizzards, and the droughts.

Although not receptive to the idea of irrigation as a means of watering the land initially, the farmers along the North Platte saw that increases in agricultural production were possible when they no longer relied solely on rainfall. They dug canals, used water wheels, and while envisioning the cultivation of 60,000 acres along the North Platte, they were lucky to irrigate between 5,000 and 8,000 acres with the limited water supply. As with most locations in the arid West, local capital or private investors could not raise the funds necessary to construct dams to store enough water for the irrigable lands. Surveys had been prepared at the turn of the century for the construction of irrigation works, but it was not until Wyoming Senator F. E. Warren helped with the passage of the national reclamation bill was there hope for the lands along the North Platte.²²

As possible recognition for Warren's assistance as well as the Nebraska congressional delegation's efforts in enacting the National Reclamation Law, Secretary of the Interior Hitchcock authorized the Sweetwater Project, later known as the North Platte, as one of the first to be developed by the newly formed Reclamation Service. Within the space of ten years, the Pathfinder Dam, cornerstone of the project and named after the early explorer, John C. Fremont,

²²L. Carl Brandhorst, "The North Platte Oasis: Notes on the Geography and History of an Irrigated District," *Agricultural History*, 51:1 (1977): 168.

who traversed the North Platte River and perchance thought one day that the river would be tamed and provide the necessary life-giving blood to the land, was completed. The federal engineers constructed a diversion dam and irrigation system, including the 130-miles long Fort Laramie Canal, and the Interstate Canal, over the next two decades, with water being delivered to the farmers as early as the 1908 irrigation season.²³

There were immediate signs of success on the North Platte Project with the construction of the Pathfinder Dam. Agriculture expanded with over a thousand newly irrigated farms by 1912, and during the next two years, the farm population increased by fifty percent. Livestock, both cattle and sheep, were brought to the project lands to feed on the crops during the winter. By the mid-1920s, over two thousand miles of canals and laterals were constructed on the North Platte Project, bringing water to about 220,000 acres in both Wyoming and Nebraska. Reclamation engineers resurrected an earlier idea to construct a regulating reservoir with Guernsey Dam, at Goshen Hole, Wyoming and additional reservoirs, Lake Alice and Lake Minatare in Nebraska. With the assurance of a water supply, the farmers started growing “speciality crops,” such as sugar beets and alfalfa while continuing to raise potatoes, oats, corn, wheat, and barley. Under Warren Act contracts, the waters from the North Platte Project’s storage dams are delivered to an additional 100,000 acres.²⁴

Although the early reclamation settlers on the North Platte Project now had a water supply, they still faced other hardships, especially those unfamiliar with irrigation farming. The

²³Brandhorst, “North Platte Oasis,” 170.

²⁴Brandhorst, “North Platte Oasis,” 171. U.S. Department of the Interior, *Federal Irrigation Projects*, 33-34. Robert Autobee, “North Platte Project,” U.S. Bureau of Reclamation, Internet version.

strong winds often blew the topsoil away with the newly planted seed and uneven application of water could send it all down the drainage ditch to the canal or river. Bounties were often placed on grasshoppers and gophers. Many of the new farmers could not produce enough agricultural crops to pay for all the costs of keeping a household and paying the reclamation charges too. Those who were successful were usually the farmers who came from neighboring states or regions and were familiar with the agricultural techniques, such as soil preparation and crop rotation. After the first World War, the United States gave returning servicemen the opportunity to farm on the North Platte Project, but while these soldiers and sailors could survive on the battlefield, few would be productive in raising crops. Farming was not always an easy enterprise on a reclamation project.²⁵

Salt River Project

The early travelers crossing southern Arizona on their way to California followed the Gila River, not usually proceeding up to the Salt River. But when the miners discovered bodies of ore along the Hassayampa River and then the military came to keep the hostile Indians away, Jack Swilling found the remains of prehistoric canals in what became the Salt River Valley. By the 1870s other farmers and settlers found the land along the Salt River to be fertile and stayed to cultivate the soil, growing extensive fields of grain or alfalfa, or establishing commercial businesses, but within thirty years the flow of the river was over appropriated and growth could not be maintained.

At least a half dozen companies constructed canals, most cooperative organizations of local farmers who worked together to build the irrigation channels to deliver water to their own

²⁵U.S. Bureau of Reclamation, "North Platte Project," Online version.

land. In 1883, the Arizona Canal Company sold bonds to investors around the country in order to construct the Arizona Canal on the northern tier of the Salt River Valley. This canal company expected to make a profit from the sale of land and water rights to new settlers and with its chief construction contractor, W. J. Murphy, and original incorporator Clark Churchill, formed the Arizona Improvement Company. Sitting on the first Board of Directors were local businessmen, Murphy, Churchill, and William Christy, along with California and Nevada entrepreneurs, Frederick W. Sharon and Francis G. Newlands.²⁶

W. J. Murphy and his family purchased several tracts of land under the Arizona Canal and started an experimental citrus orchard with over 1,800 young orange and other fruit trees from southern California. The trees proved so successful other varieties were planted including olive and lemon. Because the Arizona fruit ripened prior to the orchards in Southern California, Arizona landowners could sell their produce to the eastern markets first. By the mid-1890s over 150,000 citrus trees were growing on 1,500 acres and farmers learned they could grow the trees with less acreage and work than the traditional harvests of grain.²⁷

W. J. Murphy built the Ingleside Club, complete with a golf course, near the Arizona Canal to bring investors and potential landowners to the Salt River Valley. With the help of men like Murphy, the population of the Salt River Valley doubled between 1890 and 1900, reaching almost 20,000 residents and irrigated acreage increased from 111,000 to 130,500 acres. By the

²⁶For a complete history of the Arizona Canal see Shelly Dudley, "Arizona Canal, HAER No. AZ-19", (SRP 1991). SRP Research Archives staff have written HAER (Historic American Engineering Record) reports on all the major canals of the Salt River Project.

²⁷Dudley, "Arizona Canal."

turn of the century, however, the landowners realized that a storage dam was needed on the upper Salt River for growth to continue, but private enterprise could not provide the needed funding.²⁸

Arizona's struggle for a permanent water supply moved to Washington, D.C. at the beginning of the new century. Benjamin Fowler, chairman of the Maricopa County Water Storage Committee, had been in the federal Capitol at various times since 1900, lobbying for passage of a bill to permit the county to issue bonds for construction of a dam and then stayed to fight for a federal reclamation act. Through the efforts of national reclamation lobbyist George Maxwell, Fowler, who later became the first president of the Salt River Valley Water Users' Association, became well acquainted with Frederick Newell and Gifford Pinchot, Chief Forester. Fowler offered the U.S. Geological Survey \$1,500 in matching funds to continue its earlier investigation of the Salt River, including a survey of a damsite at the confluence of the Salt River and Tonto Creek. Maxwell moved to the nation's Capitol, leasing a house near Newell to aid Francis Newlands in his congressional fight for a reclamation act. At his Washington residence, Maxwell gathered Newell, Fowler, and Pinchot to discuss the national irrigation movement and a possible Salt River Valley reclamation project.²⁹

Gifford Pinchot and George Maxwell were good friends with vice-president Theodore Roosevelt, a strong supporter of the reclamation and conservation movements. Following the ascendancy of Roosevelt to the office of the President, the reclamation measure passed Congress and received Roosevelt's signature. The Secretary of the Interior was authorized to choose the

²⁸Dudley, "Arizona Canal." U.S. Census, Historical Data. *Hurley v. Abbott* No. 4564, Decision and Decree, March 1, 1910.

²⁹Smith, "The Campaign for Water in Central Arizona," 136-37.

first projects from a list supplied by Newell. The influence of Newell, Pinchot, and Maxwell, with Fowler's organization in the Salt River Valley, made the Tonto project an attractive enterprise to the federal government, although most of the land was in private ownership.

Within months of the passage of the reclamation act, engineers arrived in the Salt River Valley to survey the lands and possible location of irrigation works. Prior to the construction of what would become Theodore Roosevelt Dam, the engineers constructed a sixty-mile road through the rugged Superstition Mountains and the canyons of the Salt River to bring supplies from railhead at Mesa to the dam site. Building the "Apache Trail" would be one of the most dangerous tasks of the dam construction process and in its first month of operation, over a million and one half pounds of freight would be hauled over it. Louis C. Hill, the supervising Reclamation Engineer traveled the Apache Trail while overseeing construction of the Roosevelt Dam. Built between 1905 and 1911, crews laid stone from the neighboring canyon walls for the rubble-masonry thick-arch structure which spanned the Salt River to an original height of 280 feet and crest length of 723 feet, holding back over 1,300,000 feet of water. Stonemasons cut the upstream and downstream faces of the six to ten-ton blocks which were laid in a stair step fashion, giving the dam its identifiable appearance. President Theodore Roosevelt attended the dam's dedication, traveling over the Apache Trail, on March 18, 1911.³⁰

Flooding would delay construction at the dam site, but would also lead to the present configuration of the Salt River Project. The Arizona Dam, just below the confluence of the Salt and Verde rivers, diverted water to the north side canals, but was prone to damage by floods and

³⁰SRP Research Archives staff is in the process of completing a centennial history of the Salt River Project, to be published in the fall of 2002 by Arthur H. Clark Company.

in 1905, a major flood swept down the Salt River. The Arizona Dam was washed away and the farmers north of the Salt River approached Louis C. Hill for assistance. To unify the lands in the Salt River Valley, the Reclamation Service constructed the 1,000 foot long Granite Reef Diversion Dam which diverts water to both the north and south side canals. The federal government purchased many of the existing canals within the Salt River Project boundaries and built additional ones to bring the waters of the Salt and Verde rivers to 170,000 acres.

After prolonged conferences on irrigable acreage and repayment costs of the project, Secretary of the Interior Franklin K. Lane signed over operational control of SRP to the Salt River Valley Water Users' Association in 1917. Significantly, the September 6, 1917 agreement permitted the Association to retain the power revenues generated at SRP facilities, thus allowing for its future growth. Conceived by the Reclamation engineers as a source of electricity for construction of Roosevelt Dam, power generation developed by a power canal and as part of the dam were in the drawings almost from the initial plans. During the 1920s, Project management expanded its hydropower installations with the construction of three additional dams on the Salt River and more lands joined the Association, bringing its membership up to 242,000 acres.

Today

In 1902, the authors of the National Reclamation Act provided a way for the settlers to support their families and develop the West through farming. The first five reclamation projects encountered varying degrees of success, but all managed to transform the land, some as originally intended, others with certain limitations, and at least one changed a fertile agricultural valley into a major metropolitan center that sparked the development of the whole state.

While the men of the Newlands Project envisioned irrigating 200,000 acres at its inception, by 1970, 62,000 acres received project water. Today claims by others to the waters of the Truckee and Carson rivers and Lake Tahoe, including land and water set aside for a wetlands project in Lahontan Valley and settlement of water rights with the Pyramid Lake Indian Tribe, limited the amount available for farming. Despite the water woes, the population has increased from under 1,000 people when the Newlands Project was authorized to over 18,000 people living within the Project lands. The “businessman/farmer” has become a part-time entrepreneur with more than 4,000 part-time farms averaging 13 acres, contributing approximately 35% of the current economy in Churchill County with a total crop value of a little over \$13 million in 1992. The waters of the Newlands Project also support the growing recreational activities of camping, boating, and fishing.³¹

Currently farmers irrigate approximately 70,000 acres on the Uncompahgre Project, more than double the amount prior to its selection as a reclamation project, but less than the 130,000 acres planners imagined could be cultivated. Following the transfer of the operation and maintenance of the project to the Uncompahgre Valley Water Users’ Association in 1932, additional irrigation works were constructed, including the Taylor Park Dam to regulate the water for the Gunnison Tunnel. Crops grown today are principally the same as when the project started except for sugar beets. In the 1960s, the farmers started growing malt barley for the manufacture of beer by the Adolph Coors company. Today the population is closer to 20,000, whereas a century ago, the region contained less than 5,000 residents.³²

³¹U. S. Bureau of Reclamation, “Newlands Project.”

³²U. S. Bureau of Reclamation, “Uncompahgre Project.”

Farmers on the Milk River Project cultivate about 100,000 acres, certainly more than three times the amount irrigated 100 years ago. Project lands, stretching 165 miles, are divided into the Dodson Pumping Unit, and the Chinook, Malta, and Glasgow Divisions with individual irrigation districts operating the transmission and distribution facilities and the Bureau of Reclamation retaining control over the storage works. Like the Newlands Project, many of the current farm sizes provide income for only a part-time living, while owners have jobs in the nearby cities. The irrigated acreage has remained relatively stable in recent years, with ranching and farming the main industries on project lands.³³

Urbanization has not been a factor on the Milk River Project, but other elements have influenced this reclamation project. Over the years, changes in crops grown have impacted the neighboring communities. Sugar beets, once a major crop that required a large labor force as well as producing feed for sheep, is no longer grown on the project lands. The elimination of this crop had a trickle down effect - without the sugar beets, the large number of migrant workers have not been needed and the sheep industry left the Milk River area. Extreme weather conditions, ranging from 100 degrees in the summer to minus 40 degrees in the winter, have also aided in the reduction of population on the Milk River Project. Farmers also have to contend with endangered or threatened species issues in the future to keep their irrigation water. Recreation is a major growth industry in the West and the creation of the Fresno and Nelson

³³U.S. Bureau of Reclamation, "Milk River Project."

reservoirs and Lake Sherburne, have provided a favorite venue for boaters and fishermen who can also enjoy the waters of this reclamation project.³⁴

Since a handful of mountain men began trapping the beaver, to the early immigrants looking for a better life, to the rancher seeking grazing lands, to the farmer searching for the fertile acre and enough water, the North Platte Project transformed the prairies to a part of America's farmland. At the turn of the century, the population of Scotts Bluff County was less than 3,000 people, while today, in the city of Scottsbluff alone, there are over 14,500 residents. With the North Platte Project, the irrigated acreage increased from 3,000 acres to over 300,000 acres and encouraged the development of the sugar beet industry worth over \$47 million in 1991. Besides being a cash crop, sugar beets also provide feed for the traditional western occupation of ranching; nearly a half a million head of cattle, sheep and hogs are raised on the North Platte Project. Almost from its start, the waters of the North Platte have been a safe haven for wildlife after President William Howard Taft created the Pathfinder National Wildlife Refuge. Project lakes continue to provide a resting place for migratory fowl as well as a setting for recreational activities, including boating and fishing.³⁵

From its foundation of bringing water and power to its shareholders in the Salt River Valley, SRP has become the largest raw water supplier in the Phoenix metropolitan area and the nation's third-largest public power utility, delivering power to over 745,000 customers. Maricopa County is the major population center of Arizona, increasing from 20,450 people in

³⁴U.S. Department of the Interior, *Federal Irrigation Projects*, 29-30. Correspondence, Paula Bolland, Malta Irrigation District, July 11, 2001. Telephone interview, Bob Inman, Zurich Irrigation District, August 20, 2001.

³⁵U.S. Bureau of Reclamation, "North Platte Project."

1900 to over 3 million in 2000. Phoenix, in the heart of the Salt River Valley, is the county seat, the state capitol of Arizona, and now the 6th largest city in the United States.

For almost one hundred years, the Association has continued to provide water to over 300,000 acre member and neighboring lands and has evolved into a multi-dimensional water service provider. Although only 44,000 acres are still being farmed within the Project, SRP delivers water to urban irrigators and several municipalities who treat the water and distribute it to SRP's urban shareholders. To this end, ten water treatment plants operated by eight cities dot the SRP water system.

SRP's stewardship of central Arizona's water supply has made it a leader in the management of water resources, encompassing a wide range of activities. In partnership with several Valley cities, SRP jointly owns and operates the Granite Reef Underground Storage Project (GRUSP), one of the largest recharge projects in the United States. GRUSP stores Central Arizona Project water on behalf of the Arizona Water Banking authority and others for use in the future when dry conditions will prevail. To assist various Valley entities, SRP cooperated with the Bureau of Reclamation in the delivery of Central Arizona Project water with the construction of the CAP/SRP Interconnect Facility near Granite Reef Dam. Operated by SRP, the interconnect links the CAP canal with SRP's irrigation system, further allowing for the purchase of surplus Colorado River water to meet the demands of our shareholders during times of water shortage as well as assist in water exchanges.

At the end of World War II, the Salt River Valley experienced a major explosion of growth which impacted SRP's traditional farming community. The returning veterans wanted homes and agricultural lands were sold for thousands of houses in the newly developed

subdivisions. With increased urbanization, the Association had to find new ways to operate and maintain its canal system. Under the Bureau of Reclamation's Rehabilitation and Betterment Program, SRP started construction and implementation of the Supervisory Control system in the late 1960s. The advances in electronic equipment allowed for the design of a water distribution system covering 138 miles to be handled by a single operator. By the mid-1970s, computer equipment monitored telemetered data which displayed water levels and gate positions. The dispatcher could regulate 331 radial gates and almost one quarter of the deep-well pumps belonging to SRP. With this system, the water levels of the canals and laterals could be maintained at a constant level. Gone are the days when bells rang at the home of the gate operators to warn about pending trouble.

Keeping pace with new technology allowed SRP to utilize the new water Supervisory Control and Data Acquisition (SCADA) developed between 1989 and 1991. SCADA is a complex computer-based system which allows remote control and monitoring of the entire water canal system, a major portion of the deep-well system, and numerous sites of interest to water accounting concerns. The system remotely scans and operates over 120 sites on the canals and controls over twenty off-project flow and special-delivery sites and an ever-expanding number of water quality monitoring stations throughout the system.

With thousands of homes adjacent to the canals, SRP continues to maintain the physical appearance of its irrigation facilities. No longer are sheep seen eating the grass along the canal banks or the Yaqui laborers leading the horses in the ditches to eliminate the aquatic moss and weeds. In 1989, SRP instituted a program of stocking its canals with white Amur, a sterile weed-eating fish that originally came from China and is considered an economically and

environmentally safe alternative to chemical and mechanical weed control. SRP crews trim the trees and remove brush and other vegetation along the canal banks, not only for its own maintenance vehicles, but for the thousands of bicyclists, joggers, and horseback riders who use the paths for recreation. As part of a program completed in 1989, SRP installed safety steps and ladders providing a quick exist for stray animals and people who accidently enter the canal system.

From its inception at providing electricity for the construction of Roosevelt Dam, power generation has been an integral part of the Salt River Project. The Association constructed its first hydropower plants on the Valley canals between 1911 and 1913, expanding its production with the construction of three additional dams, Mormon Flat, Horse Mesa, and Stewart Mountain, on the Salt River between 1923 and 1930. SRP had 49 power customers in the 1920s, by 1947, it delivered electricity to over 12,000 customers and by 2003, its power should be transmitted to close to 800,000.

To meet this continually growing demand for electricity, SRP upgraded its transmission and distribution systems over the years, converting from 25 cycle power to 60 cycle after World War II and building non-hydropower plants. Within the Salt River Valley, SRP built several oil or natural gas generating stations and participated in several coal-fired power plants in the southwest region, including Mohave Generating Station and the Four Corners Power Plant. As part of the Central Arizona Project, SRP was chosen as the construction manager and plant operator of the Navajo Generating Station near Page, Arizona, participating with other utilities and the federal government. During the 1970s, SRP decided to construct the coal-fired Coronado Generating Station alone, while being a partner in the Palo Verde Nuclear Generating Station

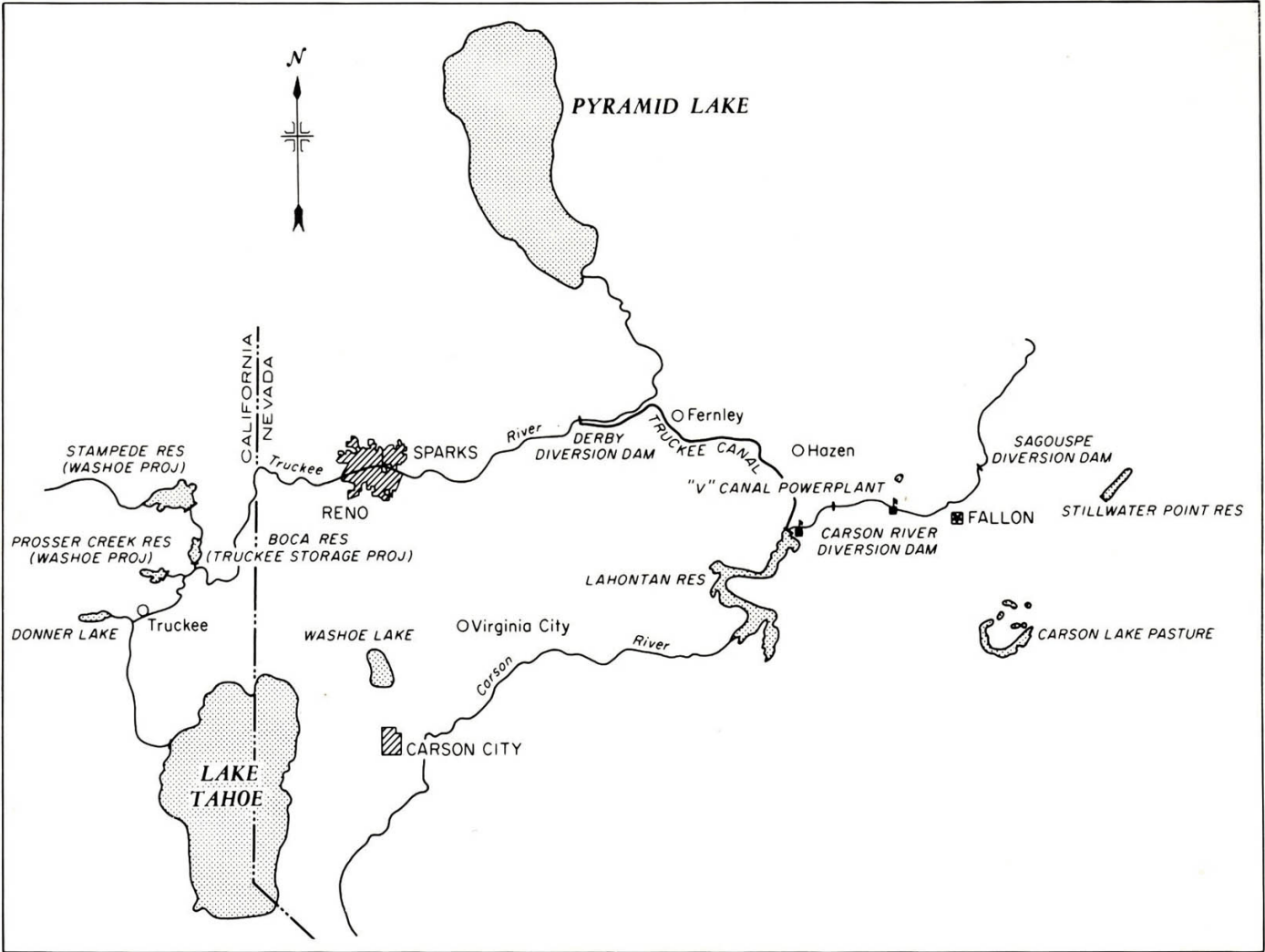
southwest of the Salt River Valley. In order to provide its customers with a reliable source of power in the future, SRP is expanding its Valley generating stations and finding new and environmentally compatible methods for the production of power, including landfill gasses and solar energy. From its inception to the present day, Salt River Project has supplied both water and energy that helped fuel the growth of its shareholders and central Arizona.

The passage of the National Reclamation Act heralded a new era in the development of the arid West. While some might argue that the rhetoric of its passage is mythic, nonetheless, the act President Theodore Roosevelt signed on June 17, 1902, transformed the West. Prior to their selection by Secretary of the Interior Ethan A. Hitchcock as the first five reclamation projects, the lands in Nevada, Colorado, Montana, Wyoming-Nebraska, and Arizona, were being farmed, but without a stable water supply, sustained growth could not be achieved. The federal government, in the name of the Reclamation Service and later the Bureau of Reclamation, provided the funding and the engineering expertise to construct the necessary storage works, to allow for that development, whether in actual increased irrigated acreage, population, or economic value. The success of the National Reclamation Act can be measured by the accomplishments of the Newlands, Uncompahgre, Milk River, North Platte, and Salt River reclamation projects.

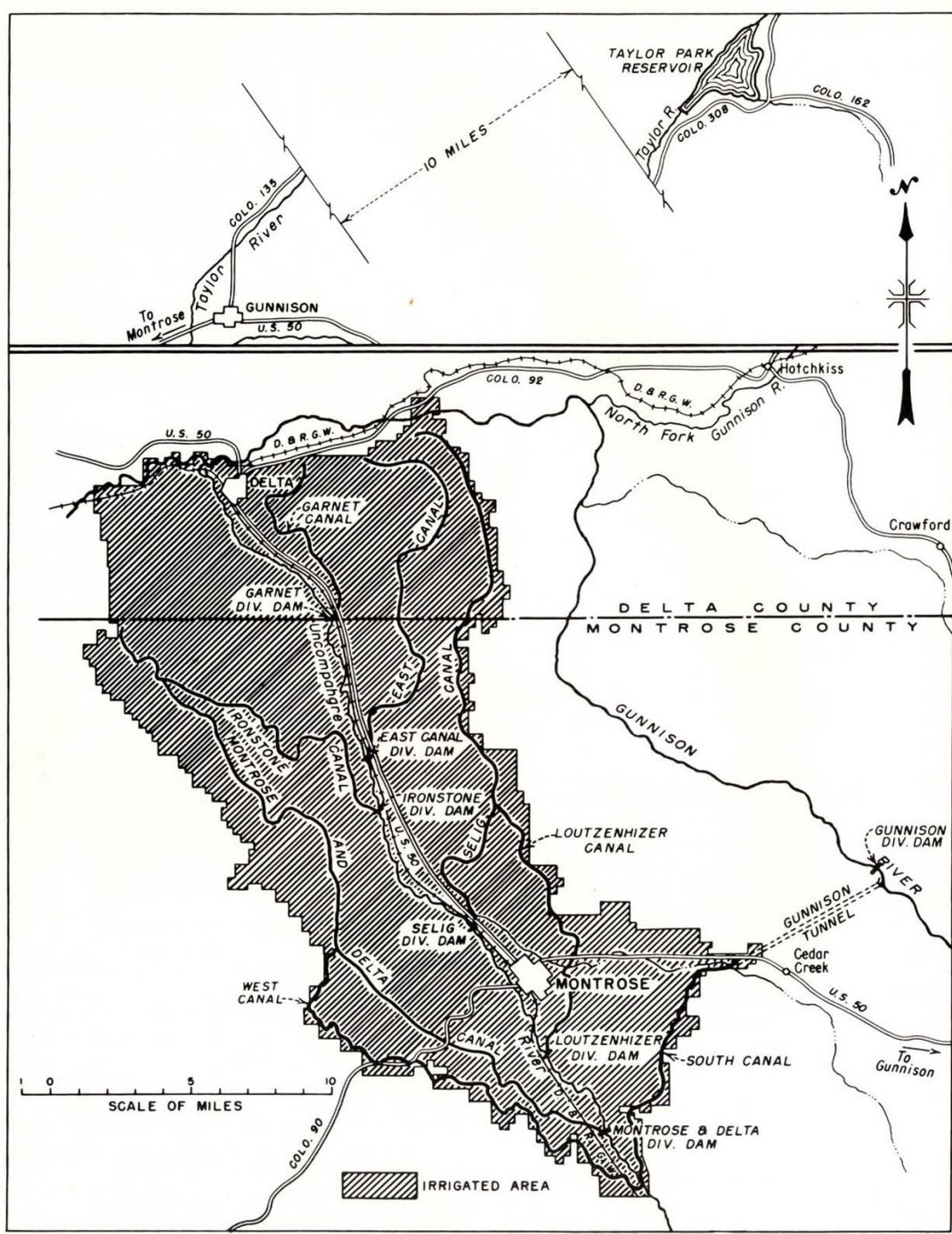
John Wesley Powell surveyed the American West more than one hundred years ago and saw thirty million acres that could be irrigated. Because of the vision of a few men and the Bureau of Reclamation, nine to ten million acres are productive, whether growing crops, homes, communities or fueling industries. Reclamation is the cornerstone of growth in the West: providing a stable water supply for crops, transforming the desert to farmlands, and now

farmlands to cities, businesses, and communities; producing electricity to operate the irrigation pumps, light the homes, and now power our industries. Reclamation's objective hasn't ceased, but instead becomes more fully developed: the foundation of growth in the American West.

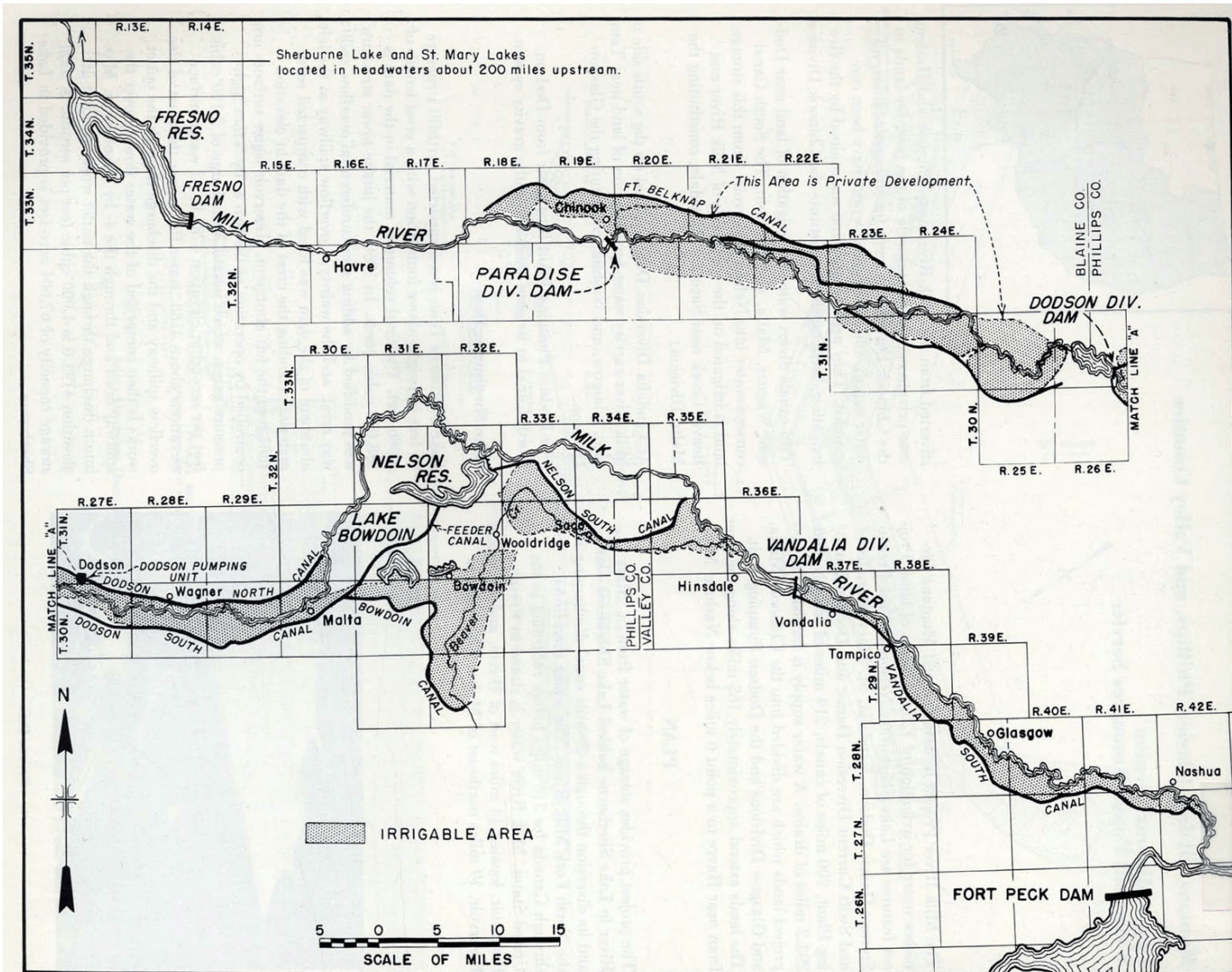
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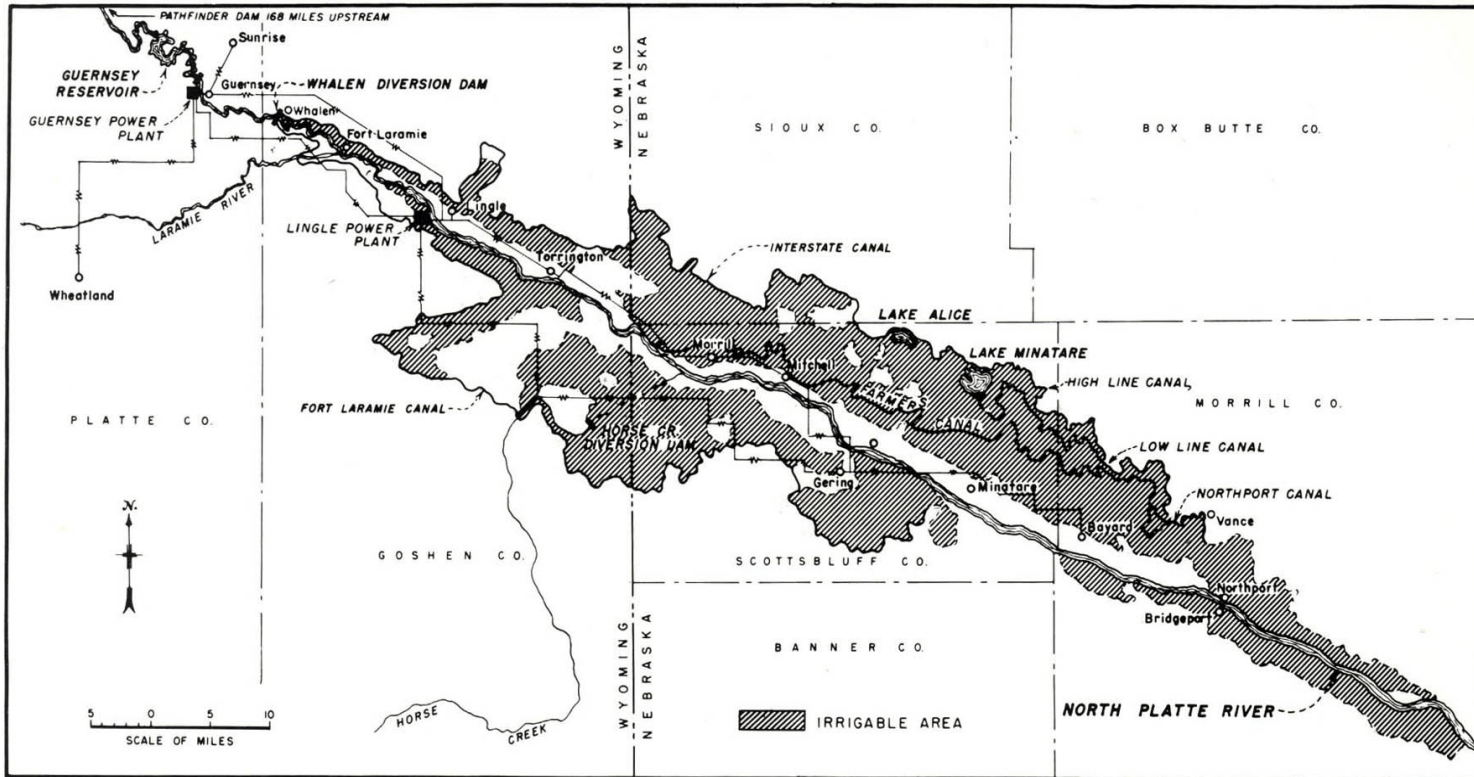
Newlands Project



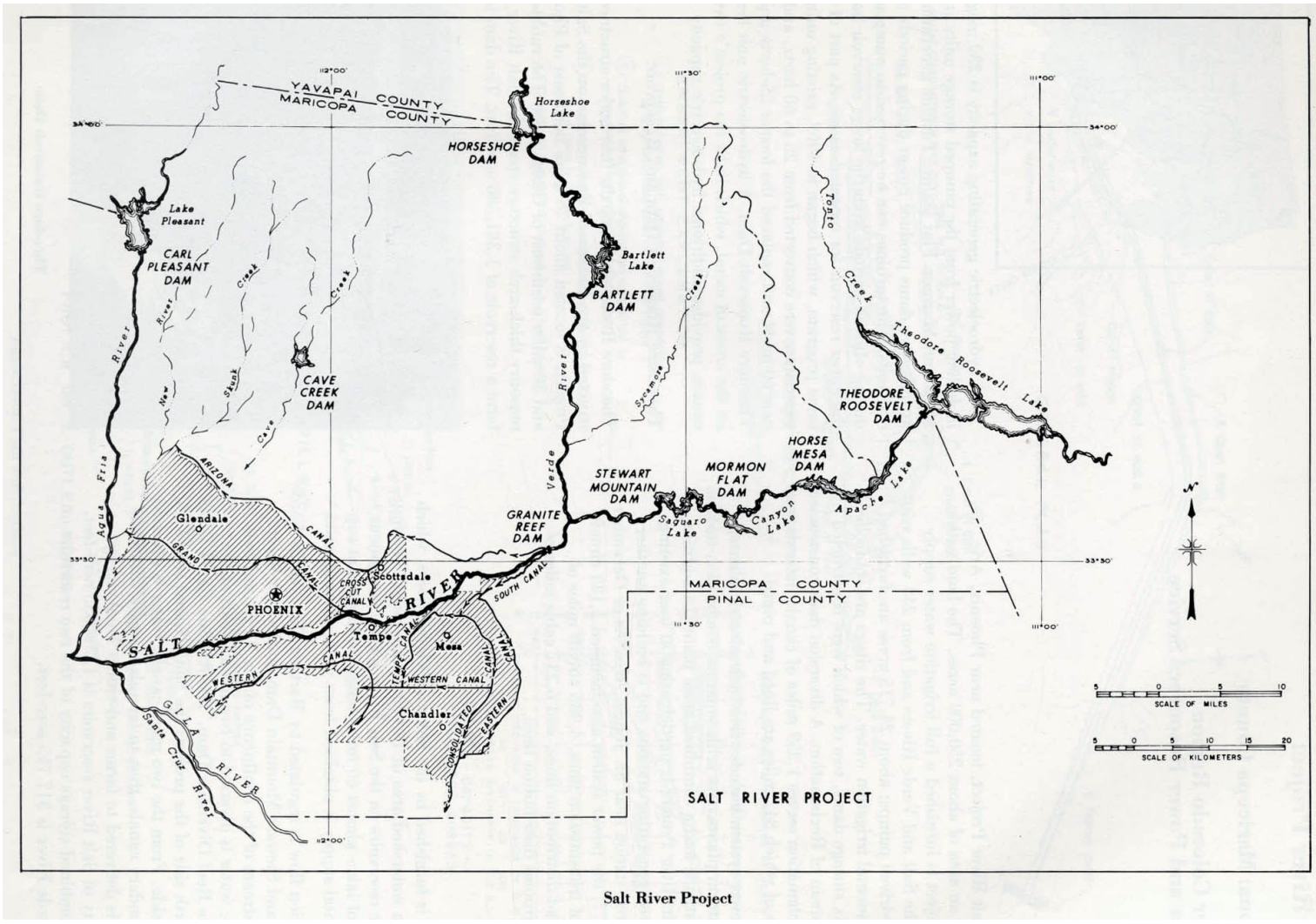
Uncompahgre Project



Milk River Project



North Platte Project



Salt River Project