

Water Resources Survey



St. Mary's Mission, First Church in Montana



Part I:
HISTORY OF LAND AND WATER
USE ON IRRIGATED AREAS

and

Part II:
MAPS SHOWING IRRIGATED
AREAS IN COLORS DESIGNATING
THE SOURCES OF SUPPLY

*Ravalli County
Montana*

Published by
STATE ENGINEER'S OFFICE
Helena, Montana, June 1958
Reprinted as of June 1965

WATER RIGHTS BUREAU
DEPT OF NATURAL RESOURCES
& CONSERVATION
REGIONAL OFFICE
P.O. BOX 5004
MISSOULA, MT. 59806

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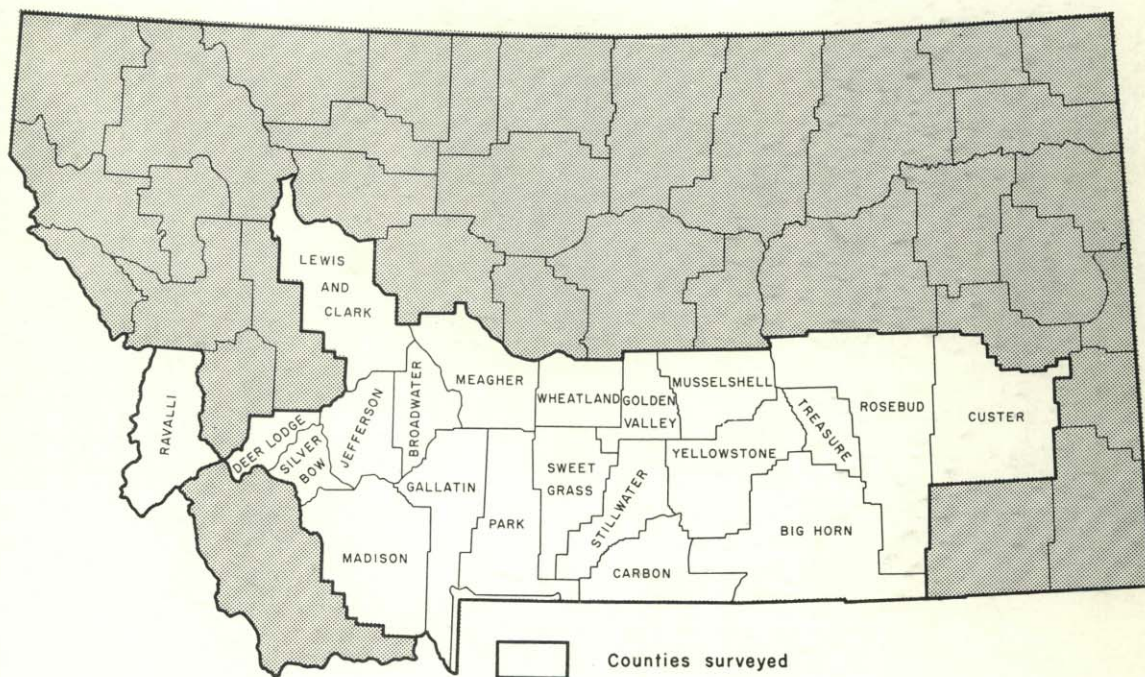
Michael McLane

WATER RESOURCES SURVEY

RAVALLI COUNTY, MONTANA

PART I

History of Land and Water Use
on Irrigated Areas



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STATE ENGINEER'S OFFICE

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Hans L. Bille..... Assistant
C. Sumner Heidel..... Deputy Engineer
A. D. McDermott..... Accountant for State Engineer & SWCB

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MONTANA STATE AGRICULTURAL EXPERIMENT STATION

O. W. Monson, Irrigation Engineer and Consultant, Bozeman

June, 1958

Honorable J. Hugo Aronson
Governor of Montana
Capitol Building
Helena, Montana

Dear Governor Aronson:

Submitted herewith is a consolidated report on the Water Resources Survey of Ravalli County, Montana.

This work is being carried on with funds made available to the State Engineer by the 35th Legislative Session, 1957, and in cooperation with the State Water Conservation Board and the Montana State Agricultural Experiment Station.

The report is divided into two parts. Part I consists of history of land and water use, irrigated lands, water rights, etc., and Part II contains the township maps in the county showing in color the lands irrigated from each source or canal system.

Work has been completed and reports are now available for the following counties: Big Horn, Broadwater, Carbon, Custer, Deer Lodge, Gallatin, Golden Valley, Jefferson, Lewis and Clark, Madison, Meagher, Musselshell, Park, **Ravalli**, Rosebud, Silver Bow, Stillwater, Sweet Grass, Treasure, Wheatland and Yellowstone.

The office files contain minute descriptions and details of each individual water right, water and land use, etc., which are too voluminous to be included herein. These office files are available for inspection to those who are interested.

The historical data on water rights contained in this report can never become obsolete. If new information is added from time to time as new developments occur, the records can always be kept current and up to date.

Respectfully submitted,
FRED E. BUCK, State Engineer

ACKNOWLEDGMENTS

A survey and study of water resources involves many phases of both field and office work in order to gather the necessary data to make the information complete and comprehensive. Appreciation of the splendid cooperation of various agencies and individuals who gave their time and assistance in aiding us in gathering the data for the preparation of this report is hereby acknowledged.

County Officials

Anfin Anfinson, Commissioner
A. J. Patterson, Commissioner
R. M. Wonnacott, Commissioner
W. P. Thomas, County Extension Agent
Harriette Snow, Clerk of District Court
Anthony Hork, Clerk and Recorder
Roy Tillman, Assessor

Robert G. Dunbar
Historical data....."Foreword".....Prof. of History, Mont. State College
John Hakola....."History and Organization".....Research Assistant
Historical Society of Montana
R. A. Dightman....."Climate".....State Climatologist, U. S. Weather Bureau
David R. Cawfield....."Soils".....State Soil Scientist, U. S. Dept. of Agriculture
Frank Stermitz....."Stream Gaging Stations".....District Engineer, U.S.G.S.
Walter C. Ackerman....."Mining".....Bureau Geologist
Montana Bureau of Mines and Geology
C. A. Rose....."Bitterroot Soil Conservation District".....
Work Unit Conservationist, S.C.S.
L. S. LaTray....."State Fish Cultural Station".....Superintendent
Thurman H. Trosper....."Bitterroot National Forest".....Supervisor, USDA,
Forest Service
George Ruffatto.....Secretary, Bass Lake Reservoir Company
W. P. Robb.....Secretary, Big Creek Lakes Reservoir Association
Elsie Oliva.....Secretary, Bitterroot Irrigation District
Harley Sargent.....Secretary, Blodgett Creek Irrigation District
Mrs. Melvin Foster.....Secretary, C. & C. Ditch Users' Association (Mutual)
T. J. Micka.....Secretary, Canyon Creek Irrigation District
Charles Schmitz.....Secretary, Carlton Creek Irrigation Company
Leona Shival.....Secretary, Charlos Irrigation District

Josie M. Cochran	Secretary-Treasurer, The Corvallis Canal and Water Company
H. C. Groff	Secretary, Etna Ditch Company (Mutual)
Mary Ess	Secretary, Fred Burr Creek Water Users' Association
R. M. Gerer	Secretary, Lomo Irrigation District
Mrs. Marie Kaphammer	Secretary, Mill Creek Irrigation District
Roscoe A. Buzzard	Supervisor of Projects, S.W.C.B. Ravalli Water Users' Association (Daly Ditch Project) West Fork of the Bitterroot Storage Project
Arne Fosdal	Secretary, Rock Creek Water Company
M. W. Wax	Secretary, Sunset Irrigation District
Fred Erhart	Secretary, Supply Ditch Association (Including Wood-Parkhurst Ditch)
Harold Bozlee	Secretary, Sweeney Creek Water Users' Association
Marguerite Buhler	Secretary-Treasurer, Tin Cup Water Company
Clifford Sanders	Secretary, Union Ditch Company (Mutual)
Alta Porter	Secretary, Ward Irrigation District
Carl Dayton	Manager, Webfoot Ditch Company (Mutual)
Russell O. Iman	Secretary, Woodside Irrigation Company

The State Engineer's Office, Water Resources Survey, hereby expresses sincere appreciation to the many ranchers, farmers and stockmen who have given their helpful cooperation in this survey.

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FOREWORD

MONTANA'S WATER RIGHT PROBLEMS

Our concern over surface water rights in Montana is nearly a century old. When the first Territorial Legislature, meeting in Bannack, adopted the common law of England on January 11, 1865, the Territory's legal profession assumed that it had adopted the Doctrine of Riparian Rights. This doctrine had evolved in England and in eastern United States where the annual rainfall is generally more than twenty inches. It gave the owners of land bordering a stream the right to have that stream flow past their land undiminished in quantity and unaltered in quality and to use it for household and livestock purposes. Since the law restricted the use of the water to riparian owners and forbade them to reduce appreciably the stream flow, the early miners and ranchers in Montana favored the Doctrine of Prior Appropriation which permitted diversion and diminution of the streams. Consequently, the next day the legislature enacted a law which permitted diversion by both riparian and non-riparian owners. Whether or not this action provided Montana with one or two definitions of water rights was not settled until 1921 when the Montana Supreme Court in the *Mettler vs. Ames Realty Co.* case declared the Doctrine of Prior Appropriation to be the valid Montana water right law. "Our conclusion," it said, "is that the common law doctrine of riparian rights has never prevailed in Montana since the enactment of the Bannack Statutes in 1865 and that it is unsuited to the conditions here . . ."

The appropriation right which originated in California was used by the forty-niners to divert water from the streams to placer mine gold. They applied to the water the same rules that they applied to their mining claims—first in time, first in right and limitation of the right by beneficial use. Those who came to the Montana gulches brought with them these rules, applying them to agriculture as well as to mining.

The main points of consideration under the Doctrine of Prior Appropriations are:

1. The use of water may be acquired by both riparian and non-riparian landowners.
2. It allows diversion of water regardless of the reduction of the water supply in the stream.
3. The value of the right is determined by the priority of the appropriation; i. e., first in time is first in right.
4. The right is limited to the use of the water. Stream waters in Montana are the property of the State and the appropriator acquires only a right to their use. Moreover, this use must be beneficial.
5. A right to the use of water is considered real property only in the sense that it can be bought or sold; its owner may not be deprived of it except by due process of law.

The State Legislature has provided methods for the acquisition, determination of priority and administration of the right. No right may be acquired on a stream without diversion of water and its application to a beneficial use. On unadjudicated streams, the Statutes stipulate that the diversion must be preceded by posting a notice at a point of intended diversion and by filing a copy of it within 20 days in the County Clerk's Office of the county in which the appropriation is being made. Construction of

the means of diversion must begin within 40 days of the posting and continue with reasonable diligence to completion. However, the Montana Supreme Court has ruled that an appropriator who fails to comply with the Statutes may still acquire a right merely by digging a ditch and putting the water to beneficial use.

To obtain a water right on an adjudicated stream, one must petition the District Court having jurisdiction over that stream for permission to make an appropriation. If the other appropriators do not object, the court gives its consent and issues a supplementary decree granting the right subject to the rights of the prior appropriators.

Inasmuch as the Montana laws do not require water users to make official records of the completion of their appropriations, it becomes advisable, as soon as the demand for the waters of a stream becomes greater than its supply, to determine the rights and priorities of each user by means of an adjudication or water right suit. This action may be initiated by one or more of the appropriators who may make all the other claimants parties to the suit. Thereupon the Judge of the District Court examines the claims of all the claimants and issues a decree establishing priority of the right of each water user and the amount of water he is entitled to use. The court decree becomes in effect the deed of the appropriator to his water right.

Whenever scarcity of water in an adjudicated stream requires an allocation of the supply according to the priority of rights, the Judge upon petition of the owners of at least 15 per cent of the water rights affected must appoint a water commissioner to distribute the water. These rules were formulated to protect the rights. However, they constitute a system of local regulation which imposes such a limited control upon the individual's use of the water that they often fail to protect him.

The recordings of appropriations in local courthouses provides an incomplete record of the water rights on unadjudicated streams. In fact, the county records often bear little relation to the existing situation. Since the law places no restriction on the number and extent of the filings which may be made on an unadjudicated stream, the total amount of water claimed is frequently many times the available flow. There are numerous examples of streams becoming over appropriated. Once six appropriators each claimed all of the water in Lyman Creek near Bozeman. Before the adjudication of claims to the waters of Prickly Pear Creek, 68 parties claimed thirty times its average flow of 50 cfs. Today, the Big Hole River with an average flow of 1,129 cfs has filings totaling 173,912 cfs. A person is unable to distinguish in the county courthouses the perfected rights from the unperfected ones since the law requires no official recordation of the completion of an appropriation. Recognition by the courts of unrecorded appropriations adds to the incompleteness of these records. To further complicate the situation, appropriators have used different names for the same stream in their filings. In Montana many of the streams flow through several counties; consequently, water right filings on these inter-county streams are found distributed in two or more county courthouses. Anyone desirous of determining appropriations on a certain river or creek finds it difficult and expensive to examine records in several places. In addition, the records are sometimes scattered because the original nine counties of 1865 have now increased to 56. As the original counties have been divided and sub-divided, the water right filings have frequently not been transcribed from the records of one county to the other. Thus, in record of an early appropriation in what is at present Powell County may be found in the courthouse of the original Deer Lodge County.

It can be readily seen that this system of recording offers little protection to rights in the use of water until they are determined by an adjudication. In other words, an appropriator does not gain a clear

title to his water right until after adjudication and then the title may not be clear because the Montana system of determining rights is also faulty. In the first place, adjudications are costly, sometimes very costly when they are prolonged for years. It is estimated that litigation over the Beaverhead River, which has lasted more than twenty years, has cost the residents of the valley nearly a half a million dollars. In the second place, unless the court seeks the advice of a competent irrigation engineer, the adjudication may be based upon inaccurate evidence. In the third place, if some claimant has been inadvertently left out of the action, it is not final and may be reopened for consideration by the aggrieved party. Another difficulty arises in determining the ownership of a water right when land under an adjudicated stream becomes sub-divided in later years and the water not proportioned to the land by deed or otherwise. There is no provision made by law requiring the recording of specific water right ownerships on deeds and abstracts.

The Legislative Session of 1957 passed a law of providing for the policing of water released from the storage to be transmitted through a natural stream bed to the place of use. This law covers only unadjudicated streams. Administration of water on an adjudicated stream is done by the District Court, but it has its drawbacks. The appointment of a water commissioner is often delayed until the shortage of water is acute and the court frequently finds it difficult to obtain a competent man for a position so temporary. The present administration of adjudicated streams which cross the county boundaries of judicial districts creates problems. Many of the water decrees stipulate head gates and measuring devices for proper water distribution, but in many instances the stipulation is not enforced, causing disagreement among the water users.

Since a water right is considered real property and may be bought and sold, the nature of water requires certain limitations in its use. One of the major faults affecting a stream after an adjudication is the failure of the District Court to have some definite control over the transfer of water rights from their designated places of use. The sale and leasing of water is becoming a common practice on many adjudicated streams and has created serious complications. By changing the water use to a different location, many of the remaining rights along the stream are disrupted, resulting in a complete breakdown of the purpose intended by the adjudication. To correct this situation, legal action must be initiated by the injured parties as it is their responsibility and not the Court's.

At one time or another all of the other Western Reclamation States have used similar methods of local regulation of water rights. Now all of them except Montana have more or less abandoned these practices and replaced them by a system of centralized state control such as the one adopted by the State of Wyoming. The key characteristics of the Wyoming system are the registration of both the initiation and completion of an appropriation in the State Engineer's Office, the determination of rights and administration by a State Board of Control headed by the State Engineer. These methods give the Wyoming water users titles to the use of water as definite and as defensible as those which they have to their land.

When Montana began to negotiate the Yellowstone River Compact with Wyoming and North Dakota in 1939, the need for some definite information concerning our water and its use became apparent. The Legislature in 1939 passed a bill (Ch. 185) authorizing the collection of data pertaining to our uses of water and it is under this authority that the Water Resources Survey is being carried on. The purpose of this survey is six fold: (1) to catalogue by counties, in the office of the State Engineer, all recorded, appropriated and decreed water rights including use rights as they are found; (2) to map the lands upon which the water is being used; (3) to provide the public with pertinent water right in-

formation on any stream, thereby assisting them in any transaction where water is involved; (4) to help State and Federal Agencies in pertinent matters; (5) to eliminate unnecessary court action in water right disputes; (6) and to have a complete inventory of our perfected water rights in case we need to defend these rights against the encroachments of lower states.

In conclusion, some mention should be made regarding the enactment of laws for the orderly development of our ground water supplies. Delay in the enactment of these laws by other states has contributed to the over-development of these valuable natural resources. This in turn has caused financial losses and innumerable legal difficulties. A knowledge of the ground water hydrology with an established ground water code in Montana would protect the interests of those who have already developed ground water supplies as well as protect those who may drill wells in the future.

Since 1955 the Ground Water Branch of the U. S. Geological Survey, in cooperation with the Montana Bureau of Mines and Geology, has been making a study of the geology and ground water resources of the Bitterroot Valley. A preliminary report covering the eastern part of the valley was published by the Montana Bureau of Mines and Geology in the fall of 1956. Since that time the study has been expanded to include Surface Water measurements and complete a hydrologic inventory of the valley.

Results to date (spring 1958) indicate that ground water supplies in parts of the Bitterroot Valley are adequate for irrigation or large scale industrial use. Irrigation wells capable of yielding more than 500 gallons per minute with low pumping lifts have been installed the past few years. Wells capable of yielding more than 1,000 gpm can be constructed on the flood plain of the Bitterroot River and on some of the adjacent low terraces.

The amount of land presently irrigated by pumping from wells is small but is growing rapidly. The ground water reservoir is recharged by leakage from the many irrigation canals which lace the valley, from downward percolation of irrigation water applied to fields, from precipitation and stream flow. The water is of excellent chemical quality.

METHOD OF SURVEY

Water Resources data contained in Part I and Part II of this report are obtained from courthouse records in conjunction with individual contacts of land-ownership. A survey of this type involves extensive detailed work in both the office and field to compile a comprehensive inventory of water rights as they apply to land and other uses.

The material of foremost importance used in conducting the survey is as follows: From the files of the county courthouse the data required includes; land-ownership, water right records (decrees and appropriations), articles of incorporation of ditch companies and any other legal papers in regard to the distribution and use of water. Deed records of land ownership are reviewed and abstracts are checked for water right information when available.

Aerial photography is used by the survey to assure accuracy in mapping the land areas of water use and all the other detailed information which appears on the final colored township maps in Part II of the reports. Section and township locations are determined by the photogrammetric system, based on government land office survey plats, plane-table surveys, county maps and by "on the spot" location during the field survey. Noted on the photographs are the locations of each irrigation system, with the irrigated and irrigable land areas defined. All the information compiled on the aerial photo is transferred and drawn onto a final base map by the means of aerial projection. From the base map color separation maps are made and may include three to ten over-lay separation plates, depending on the number of irrigation systems within the township.

Field forms are prepared for each land-owner, showing the name of the owner and operator, photo index number, a plat defining the ownership boundary, type of irrigation system and source of water supply and the total acreage irrigated and irrigable under each. All of the appropriated and decreed water rights that apply to each ownership by the description of intended place of use are listed on the field form. During the field survey, all water rights listed on the field form are verified with the land-owner. Whenever any doubt or complication exists in the use of a water right, deed records of the land are checked to determine the absolute right of use.

So far as known, this is the first survey of its kind ever attempted in the United States. The value of the work has become well substantiated in the counties completed to date by giving Montana its first accurate and verified information concerning its water rights and their use. New development of land for irrigation purposes by State and Federal Agencies is not within the scope of this report. The facts presented are as found at the time of completing each survey and provide the items and figures from which a detailed analysis of water and land use can be made.

The historical data contained in these reports can never become obsolete. If new information is added from time to time as new developments occur, the records can always be kept current and up-to-date.

HISTORY AND ORGANIZATION

Although not created as a separate county until 1893, the Bitterroot Valley, which embraces the county of Ravalli, was the first permanently settled area in Montana. It has long been one of the most important agricultural communities and showed promise at one time of becoming a major mining region. In recent decades the county has attained a static position both economically and in relation to population.

The earliest inhabitants of the area were undoubtedly wandering tribes of Indians who camped in the warmer valley between hunts. Until the Flathead or Salish Indians settled there in the latter part of the eighteenth century, no tribe seems to have permanently occupied the valley. The Flatheads before 1700 occupied an area on both sides of the Continental Divide but were gradually pushed westward and northward by the more warlike Crows and Shoshoni. By 1805, when Lewis and Clark entered the Bitterroot Valley, it had become the economic and social center for the Indians. The tribe made annual trips to the large mountain valleys east of the divide and even onto the plains for buffalo but always returned to the western slope after the hunt. Traditionally the Flatheads were one of the friendliest Indian tribes in their relations with the white man.

The first white men to enter the region were the members of the Lewis and Clark Expedition who crossed from the Salmon River Valley into the Bitterroot and camped at what is now Ross' Hole on September 6, 1805. Here they met a camp of Flathead Indians. They moved down the valley at a leisurely pace and on the 9th of the same month camped near the mouth of Lolo Creek which they named Traveller's Rest. After resting for several days they resumed their journey up Lolo Creek and into what is now Idaho. July 3, 1806, found them once again at Traveller's Rest where the expedition was divided, Captain Lewis taking a route up the Blackfoot River, while Clark with 20 men turned southward and retraced their earlier route into the valley.

For the next three decades few white men except trappers and traders, mostly in the employ of British-Canadian companies, wandered into the region. Most such visits were left unchronicled. David Thompson was at the confluence of the Bitterroot and Clark Fork in early 1810 and again two years later. Ross Cox, a trapper and trader working for Astor's Pacific Fur Company, visited with the Flatheads in 1812. The Hudson's Bay Company achieved a virtual fur trade monopoly west of the Continental Divide in 1821. After 1823 company employees passed through the valley frequently. Until the decade of the 1840's no permanent inhabitants entered the area.

The first permanent settlements came as a result of the interest taken by the Flathead Indians in Christianity. Before 1830 a number of Christianized Iroquois entered the valley and were well received. Led by Ignace LaMousse, they discussed their religion with their hosts and soon interested them in Catholicism. In 1831, four Flatheads and two Nez Perce Indians were sent to St. Louis to urge the Blackrobes to come to their country. They met the priests in St. Louis, and also William Clark of the Lewis and Clark expedition, but none lived to return to the Bitterroot. Other equally unsuccessful journeys were made in 1835 and 1837. A fourth delegation, headed by "Young Ignace" LaMousse was sent down the Missouri River in 1839. This time success was achieved and LaMousse remained in St. Louis until the spring of 1840 to guide Father Pierre Jean DeSmet, a Jesuit Priest, to western Montana.

DeSmet and his guide left Missouri in March, 1840, travelling with a party of the American Fur Company. At Green River they were met by a party of Flatheads who travelled northward with him. DeSmet left the Flatheads in August, 1840, to return to St. Louis for supplies and funds. In 1841, accompanied by two priests, Reverend Gregory Mengarini and Reverend Nicholas Point, and three lay brothers, DeSmet returned to the mountains, arriving in the Bitterroot Valley on September 24, 1841. Construction of St. Mary's Mission and dwellings was immediately commenced and religious instruction given. During the autumn Father DeSmet made a quick trip to Fort Colville on the Columbia River for farming tools, seeds, cattle and other livestock. When the potatoes, wheat and oat seeds were planted and successfully grown during the following summer it represented the first agriculture in Montana. The Jesuit Fathers were the first people to irrigate in Montana, turning the waters of Burnt Fork Creek into the fields, which was probably during the year 1842.

DeSmet returned to the East to seek more assistance in July of 1842, but the missionary work was continued by later arrivals. In 1845 Father Anthony Ravalli arrived, bringing with him a small set of stones, from Belgium, for use in grinding the wheat grown on the mission farm. In 1846 he built the first grist mill in Montana and the same year a sawmill was constructed.

As the decade of the 1840's wore on, relations between the Indians and the Catholic Fathers began to be strained. The situation was made more difficult with the coming of white men and half-breeds who engaged in trading along the overland routes. The priests feared their influence on the Indians. When Great Britain ceded western Montana to the Americans in 1846, the possibility of intensified white immigration and settlement had to be considered. Incursions by Blackfeet raiders into the valley did little to help the situation and by 1850 it was decided to close the mission.

When Father Joset came from the Coeur d'Alene Mission to close St. Mary's in October, 1850, he found a purchaser in the person of Major John Owen, who had come West with an army contingent and had been discharged at Fort Hall. He had travelled northward with the intention of establishing a trading post. On November 5, 1850, Owen purchased all non-movable property for \$250.00 with the understanding that the Jesuits could have it back if they decided to reestablish the mission before January 1, 1852. This was the first real estate transaction in Montana. In 1866 Father Ravalli returned to reopen St. Mary's and built the new Mission at Stevensville on the present site. This was used until 1891 when the Flatheads under Chief Charlot left the valley for the Jocko reservation.

Fort Owen, as the new establishment was called, was erected near the old mission and was to play a vital role in the history of western Montana for two decades. As the only trading post for hundreds of miles in any direction, all travellers stopped there. Owen continued growing grain and vegetable crops and improved the saw and grist mills. He planted an orchard and developed herds of cattle. For six years after 1856 Owen served as special agent to the Flatheads. Major Owen remained in the valley until 1871 when he became mentally incapacitated and was committed to a Helena hospital. The Legislature in 1877 authorized W. E. Bass to take Owen back to his old home in Philadelphia where he died in 1889.

Among the important travellers in the region during the 1850's was the Isaac I. Stevens' railroad survey party which visited the valley in 1853-4. A western contingent of the expedition led by Lieutenant Rufus Saxton left from Vancouver and arrived in the valley in the late summer of 1853. Its purpose was to establish a supply depot. The main Stevens' party travelled westward and in September, 1853, one unit of it commanded by Captain John Mullan arrived in the valley. Mullan later estab-

lished a winter camp at Cantonment Stevens, about twelve miles south of Fort Owen, the expedition spending the winter in the new camp. Mullan returned to the region in 1858 to build the military road from Fort Benton to Walla Walla. Joseph Lomphe (Lamprey), hunter and trapper, came about 1856 to farm, though he had been in the valley as early as 1842. Thomas W. Harris, one of the first county commissioners of Missoula County, which at that time included the Bitterroot Valley, arrived about 1851 and was associated for a time with Owen in developing the farm and constructing buildings. John Silverthorn, destined to play a pivotal role in the controversy concerning the discovery of gold in Montana, also came about 1856. In regard to finding gold, Major Owen made this entry in his diary on February 15, 1852 "gold hunting found some." Later on he comments that in the same spring Samuel Caldwell found gold on Mill Creek, west of Ft. Owen. This was six years before the reputed first gold discovery in Montana by Stuart near Garrison. After 1856 travel and settlement increased. Neil McArthur, an old Hudson's Bay trapper, came to the Bitterroot in 1856 with L. R. Maillet and Henry Brooks. McArthur bought a band of horses and for a time occupied buildings at Cantonment Stevens where he engaged in stockraising. A. S. Blake, later a resident of Victor and one of the discoverers of the Curlew Mine, the largest producer in the history of the county, came to Fort Owen for the first time in 1857.

The development of the Mullan Road and the discovery of the Kootenai and Salmon Mines increased travel greatly in the region after 1860, though Fort Owen received proportionately less of it. As steamboat traffic up the Missouri River increased, some miners found the Bitterroot Valley a shorter, if somewhat difficult route to the gold fields. Settlement continued, though with the establishment of the town of Hell Gate, the Fort lost its trade supremacy. Mr. and Mrs. G. W. Dobbins arrived in 1862, she being the first white woman to settle in the valley; and their daughter, born in 1862, was the first white child born there. W. E. Bass with his wife arrived in 1864. He became a pioneer horticulturist in the Bitterroot. John K. Houk came from Idaho in 1863, began construction of a dwelling and business houses near Fort Owen, and at the suggestion of Major Owen called his settlement Stevensville. The town was platted in 1864.

About 1870 the Buck Brothers, Amos, Henry, George and Fred, came into the valley, established a store and freight outfit at Stevensville, bringing freight to the valley that had been shipped up the Missouri River by boat, and from Corinne, Utah, by rail. Around Corvallis, located near the site of old Cantonment Stevens, settled a number of Missourians who arrived in 1864 and fixed the permanent site of Corvallis four years later. Elijah Chaffin was the leader of the group of about 80 people. About the same time Tom Rollins established a store at what is now Corvallis but he failed and William McWhirk succeeded him. A. S. Blake opened a blacksmith shop in Corvallis at an early date. It was not long before a sizeable agricultural colony had grown up in the region. Small scale irrigation works were undertaken throughout the valley. Wheat, oats and potatoes formed the staple crops. During this time fruit raising also got a start. Thomas Harris in 1866 was among the first to plant fruit trees and was followed by W. N. Smith, Henry Buck and others. But the fruit industry in the Bitterroot Valley is most indebted to Ducey C. and William E. Bass who first planted trees on their Pine Grove farm near Stevensville in the early 1870's where they experimented with various types for two decades. After 1894, when the first fruit fair was held in Buck's hall at Stevensville, fruit growing became a legitimate and profitable business.

Until the Indian difficulties were ironed out the full potential of the Bitterroot country could not be realized. The Treaty negotiated by Governor I. I. Stevens, of Washington Territory, on July 16, 1855, with the Confederated Salish and Kootenai Tribes, provided for the surrender of their claims

to lands in what is now western Montana in exchange for a reservation and other considerations. On the demand of Chief Victor of the Flatheads (or Salish), the eleventh article provided for investigation of the Bitterroot Valley as a reservation site, and if it proved to be more suitable than the proposed Jocko Reserve another reservation would be created there for the Flatheads. The Bitterroot was to be closed to settlement until the investigation was concluded. The United States did not ratify the treaty until 1859 and did nothing about checking the alternate site. The Indians resisted a Presidential Order to move in 1871. The following year General Garfield met with the Indians to urge them to move; failing in this, he forged Chief Charlot's name to an agreement to move to the Jocko Reserve. The Indians denounced the fraud and a group under Charlot resisted all entreaties to move until 1891 when the deplorable condition of his tribe forced him to make the change.

The one other notable Indian incident in the latter third of the century was the retreat of Chief Joseph and his tribe of Nez Perce Indians from Idaho, fleeing from the soldiers of General Howard, in the summer of 1877. In his trek through the valley Chief Joseph retraced the route followed by Lewis and Clark in 1805. His advent threw western Montana into a panic and on Lolo Creek in the latter part of July, Captain C. C. Rawn with a force of troops from Fort Missoula and some civilians attempted unsuccessfully to stop the Indian leader. On July 28 Chief Joseph started up the Bitterroot at a leisurely pace, and stopped two days to trade at Stevensville. As they moved on they were followed by a military force commanded by General Gibbon from Fort Shaw and thirty-four volunteers from the valley. Chief Joseph's passage was peaceful, there being only a few cattle taken and one house burned. At daylight on the morning of August 9th General Gibbon charged the Indian camp in the Big Hole Valley. The battle lasted two days and nights and had it not been for the proximity of General Howard and his soldiers the results would have been another Custer Massacre. Twenty-nine men were killed and forty wounded, eighty-nine Indians were killed but no record was ever obtained of those wounded. After the battle Henry Buck and his freight outfit were commanded by General Howard to do his freighting for the rest of the campaign.

With the departure of the Indian problem and the rapid growth of Montana in the 1880's, the development of the Bitterroot Valley was quickened. The coming of the Northern Pacific Railway in 1883, and the construction of the Missoula and Bitterroot Valley Railroad to Grantsdale in 1887, were of paramount importance for they afforded the farmers greater opportunities for disposing of their crops and opened up the forest resources of the valley for exploitation to satisfy the tremendous demands of the mining community. Hamilton, Victor, Florence and Grantsdale, even though being settled by farmers at an earlier date, owe their real existence to the coming of the railroad. Marcus Daly chose the valley as a site for his Bitterroot Stock Farm, purchasing over 20,000 acres of land. Nearby he established the town of Hamilton, at which was erected a huge lumber mill by the Anaconda mining interests to provide wood products for its mines and mills. Daly's Stock Farm was noted as the home of the finest racing stable ever owned in Montana. Of greater importance was the fact that Daly constructed an elaborate irrigation system which he eventually hoped to extend throughout the valley. Much of the estate was later broken up into smaller farms.

Another factor which promoted the development of the region was the discovery in 1881 by A. S. Blake and a partner of the Curlew silver-lead mine. It was developed with financial assistance from S. T. Hauser and A. M. Holter, wealthy Helena capitalists. By 1893 it had produced over a million dollars worth of bullion. Victor, only a few miles from the mine, underwent a temporary boom as a supply center for the mining district.

Until 1893 the Bitterroot Valley remained attached to Missoula County. In 1848 the area was included in Oregon Territory. It remained without effective government for some years after it was attached to Washington Territory in 1853. But in December, 1860, that Territory created the county of Missoula and named temporary officers, one of the commissioners being Thomas Harris of the Bitterroot. The Idaho Territory retained Missoula County after 1863, but before effective government could be set up in the area, the Montana Territory was created in May, 1864. The First Montana Legislative Assembly created Missoula County in early 1865. Not until 1893 did the valley have sufficient population to warrant separate existence. The Third State Legislature in that year created Ravalli County, naming it after the early Jesuit missionary, and designated Stevensville as the county seat. By this time, however, Corvallis, Victor and Hamilton were rivalling Stevensville in economic and political importance. Corvallis citizens succeeded in obtaining an election to determine the county seat location in 1894 but were unsuccessful in obtaining the prize. Four years later a spirited three-way contest arose between Stevensville, Victor and Hamilton, with the latter city carrying off the honors at the election held on November 8, 1898. Since that time little of real importance has transpired in the political history of the county. On the national political front the county has provided one United States Senator, Henry L. Myers, a Democrat from Hamilton who served from 1911 to 1923.

The early decades of the twentieth century witnessed an agricultural boom in the county. Marcus Daly's early death on November 12, 1900, prevented him from carrying out his plan of building a railroad from Hamilton to Anaconda and constructing a huge irrigation system on the eastern side of the valley. His agricultural plan was taken up by Samuel Dinsmore, an irrigation company promoter, who formed the Dinsmore Irrigation and Development Corporation to begin construction. He interested a Chicago capitalist, W. I. Moody, in the project and in 1906 the Bitterroot Irrigation Company was formed with a capital of \$3,000,000.00. Ten years later it was sold in a receiver's sale, despite an intensive propaganda campaign, and after making water available to about 16,000 acres. In 1920 the Bitterroot Irrigation District was organized to take over the assets of the company. It too got into financial trouble and received federal aid in 1931. Inhabitants of the county took early advantage of the irrigation district act passed in 1907 by the State Legislature, operating three districts supplying water to over 20,000 acres by 1910. Irrigated acreage rose from 67,000 acres in 1900 to 107,000 acres in 1920. A decrease was registered in 1930 but by 1940 the irrigated area again exceeded that of 1920. In 1950, 104,000 acres were under ditches and used for crops.

One of the more notable features in the county is the Rocky Mountain Laboratory of the United States Public Health Service near Hamilton, where the causes of Rocky Mountain Spotted Fever were discovered and where a vaccine to prevent its ravages was developed. The Montana Board of Health and later the State Board of Entomology had been working on eradication of the disease since 1901. By 1925 a vaccine was developed and a vaccination program undertaken in the following year which has saved many lives in tick-infested areas. The government is constantly working with new diseases and the development of new vaccines. During World War II most of the vaccines used by the armed forces was prepared and shipped from Hamilton. Vaccine for yellow fever and many tropical and exotic diseases also come from there. The staff of technicians include some of the best known persons in their respective fields.

The laboratory was built by the State of Montana in 1928 and sold to the federal government in 1932.

Since 1910 Ravalli County has been relatively static in respect to population and economic make-up. The tourist industry has become a more important factor but a majority of the inhabitants continue to earn their livelihood in agricultural pursuits and in logging, or in their ancillary industries, with logging somewhat diminished in relative importance since 1910 when the inhabitants numbered 11,668. The population decreased slightly by 1920 but rose slowly until 1950 when it was 13,101. A population estimate for 1956 made by the State Board of Health indicates that the population has again decreased to approximately 12,000. By census standards the population was 100 per cent rural until 1950 when Hamilton exceeded 2,500. The rural-farm population, numbering 7,313 in 1940, dropped in 1950 to 5,796, its approximate level in 1930. Rural non-farm population, which had increased in 1940 over its 1930 figure, fell again in 1950 to 4,627. Hamilton remains the largest city in the county with a 1950 population of 2,678. It has grown very slowly since 1910 when it had 2,240 residents. No other city or town in the county approaches it in size; the other communities have remained rather stable in population or have lost residents. Ravalli County remains a rich and prosperous agricultural region with numerous small communities to serve the immediate needs of the population. It has not, on the other hand, been depopulated as much by losses to the bustling urban area surrounding Missoula, as has been the case with some other western Montana counties.

TRANSPORTATION

Due to its geographic location, Ravalli County's transportation facilities are somewhat limited, but for the most part they are adequate for its present needs. The county has access to better than average railway, highway, bus, and air travel connections compared with some of the other counties in the state.

Only one railroad enters Ravalli County. This is a branch line of the Northern Pacific Railway and originates from the main line at Missoula. It serves the towns of Florence, Stevensville, Victor, Corvallis, Hamilton, and terminates at Darby.

The county is well supplied with federal, state, and county roads. U. S. Highway 93, a main north and south highway from Canada to Kingman, Arizona, passes through the central part of the county. This highway enters the county on the north and courses southerly through the towns of Florence, Victor, Hamilton, and Darby, leaving the county at Lost Trail Pass on the divide between the Montana-Idaho State Line. There are two state highways within the county. One of these is known as "The East Side Highway," and originates from U. S. Highway 93 at Florence and follows an easterly direction across the Bitterroot River where it turns south, passing through the towns of Stevensville and Corvallis, then connects with U. S. Highway 93 at Hamilton. The other State Highway is No. 38, and is maintained for travel for only about three months of each year. The road starts just south of Grantsdale from U. S. Highway 93 and courses easterly following along Skalkaho Creek to the divide, where it enters Granite County, connecting with U. S. Highway 10A at Porters Corner seven miles south of Philipsburg. This road is a scenic route and may be used as a short cut from Butte and points east to the Bitterroot during the summer months.

The county maintains a network of improved gravel roads to all outlying rural settlements both east and west from U. S. Highway 93.

Bus line passenger transportation is confined to a daily schedule by the Northern Pacific Railway Transportation Company from Missoula to Darby, which includes mail service to the towns enroute.

The most important of the motor freight lines serving the county is a Pacific Coast firm known as the Pacific Intermountain Express Lines, which operates mainly on the west coast and extends into Idaho and Western Montana.

The nearest air travel facilities for residents of Ravalli County are at Missoula, about forty-seven miles distant from the county seat at Hamilton, where the Northwest Orient Airlines operate a daily schedule.

CLIMATE

Ravalli County, uniquely situated between mountain ranges running generally in a north-south direction, is another of Montana's so-called mountainous counties. The principal valley is that of the Bitterroot River flowing northward the entire length of the county. The main Bitterroot Mountain Range lies along the western boundary, and influences the climate of the area to a large extent. The slightly lower, but still rugged, Sapphire Mountains lie along the eastern boundary, and the Continental Divide itself forms the boundary in the county's southeastern corner. The weather records that have been collected are almost entirely from the valley areas where population and activities have centered through the years, and only limited records from mountain sites are available. It is certain, however, that the mountain sections are wetter than the valleys.

Elevations range from 10,175 feet on Trapper Peak west of Conner to about 3,200 feet where the Bitterroot River flows across the northern boundary into Missoula County. The effects of terrain on climate are fairly well known, and they are again well demonstrated here. In the valleys precipitation has shown marked seasonal variations on the average over the years, with average yearly maxima in May-June and again from late September to late November. In the mountains, however, based upon meager data, it looks as though precipitation is fairly steady—and heavy—all year except during the late June-October period. Mountain snowpacks, which we know to be considerable at the end of the winter season, furnish a large part of the heavy spring river flows experienced in most years. While mountain annual snowfall is relatively heavy, in the valleys annual totals range from less than 30 inches in the central and northern parts of the county, to 50 to 60 inches in the higher southern end of the Bitterroot Valley.

The wettest months in the valleys, at least at Stevensville and Hamilton, are usually May and June, but month-to-month variations are not as large as at stations located East of the Continental Divide. Annual precipitation averages from stations sampled range from 12.16 inches at Hamilton to 30.92 inches at Gibbons Pass (elev. 7,000 ft.) south of Sula. Average valley precipitation for most of the cultivated sections range from 12 to 16 inches. About half of the annual precipitation falls during the growing season, in contrast to the two-thirds to three-fourths that falls in most of the State east of the divide.

While winter and spring seasons have mostly cloudy weather, summers are characterized by clear skies and much sunshine. Probably no more than 25 to 35 per cent of the days during an average summer could be classed as "cloudy." Thunderstorms occur several times each summer, but they usually are not as strong as those that occur in eastern counties. Hail damage to crops seldom amounts to

much, and most thunderstorm activity seems to spend itself over the mountains. As autumn begins cloudiness increases, but with only small increases in valley precipitation. As autumn advances, however, mountain rains and snows increase in frequency, and remain fairly heavy until late the following spring. Valley fogs are fairly common during fall and early winter months. Winters are cold, but rarely experience the cold extremes observed in eastern parts of the State. With the beginning of spring, valley precipitation increases, remaining at the year's highest point until mid-June, when the cycle of sunny summer weather begins. The number of days between occurrences of 32° temperatures at Hamilton averaged 122—May 24 to September 23—for a 30-year period, indicating a growing season there of about four months. At Stevensville, however, the average freeze-free season lasts only about three months, and at Darby about 99 days. Temperatures average a little higher annually than in most Montana counties, due mostly to the limited extent or occurrence of periods of sub-zero readings. While cold air invasions can and do occur, they are infrequent, and when they do occur they are usually not as severe as on the east slopes of the Divide. Hot weather can occur in the summer season, but it is seldom oppressive because nights always become comfortably cool, and hot spells rarely last more than two or three days. High readings of over 90° occur less than 20 days a year on the average, and most summers pass with the season's highest reading having been well under 100°. Summers are relatively cool and pleasant, winters are characterized by cloudiness and steady, but not severe, cold. Tornadoes, blizzards, and extremely high winds are practically unknown.

Weather stations in Ravalli County with fairly long records include Darby, Hamilton, Stevensville, and Gibbons Pass, all four of which are active. Inactive stations, but which produced enough record to be of considerable value, are Como, Sunset Orchard, and Victor. Newer stations, active, but which as yet have only short records, include Sula and Conner. A tabulation of selected data for the first six stations mentioned follows:

Active Stations

(Temperature in Degrees and Precipitation in Inches)

STATION	YEARS OF RECORD	AVERAGE ANNUAL TEMP.*	HIGHEST	LOWEST	AVERAGE ANNUAL PRECIP.*	WETTEST YEAR	DATE	DRIEST YEAR	DATE
Darby	29	44.8	104	—36	15.81	**27.95	1927	7.21	1935
Hamilton	42	46.3	103	—39	12.16	18.03	1955	5.26	1899
Stevensville	43	44.5	102	—37	12.64	20.83	1927	7.07	1935
Gibbons Pass†	16				30.92				

*1931-1955.

**1 month interpolated record.

† Weighing rain gage since 1940, figures based upon partial records for most years.

Inactive Stations

STATION	YEARS OF RECORD	AVERAGE ANNUAL TEMP.*	HIGHEST	LOWEST	AVERAGE ANNUAL PRECIP.*	WETTEST YEAR	DATE	DRIEST YEAR	DATE
Como§	14*	44.9	103	—27	15.01	19.30	1909	12.35	1913
Sunset Orchard**	14*	43.5	98	—32	12.86	17.14	1915	6.87	1924
Victor†	17*	43.8	99	—34	13.58	19.57	1927	9.51	1928

*Some years incomplete.

§1908-1922

**1914-1929

†1913-1930

SOILS

Ravalli County is drained entirely by the Bitterroot River and its tributaries. This river has its headwaters on the divide between Idaho and Montana and flows northward to the Clark Fork River. Topographically the county consists of high mountains which rim the Bitterroot Valley with many side drainages that flow eastward from the Bitterroot Mountains on the west side of the valley and westward from the Sapphire Mountains on the east. Higher mountain peaks extend to elevations of about 10,000 feet and the entire mountain rim has an elevation of about 8,000 feet.

The kind of soils present in an area are dependent on climate, native vegetation and other biotic factors, topography, geology, and the length of time during which soil development has occurred. Since all of these factors vary widely in Ravalli County, a wide variety of soils is found.

The north central part of the county consists of lacustrine deposits, old valley filling alluvial deposits, and recent alluvial deposits on the flood plains of major streams.

The valley portion of the county includes mostly soils that are silt loam or sandier in texture with varying mixtures of coarse rock materials mostly of gravel to cobble size mixed through the soil profile. These soils belong mostly to the Brown, Chestnut, and Alluvial great soils groups with a few areas of Wet soils and Peat. Soils of the higher mountains are derived from granite, schists, limestones, and argillites. Except for barren and steep areas these soils are developed under conifer forest vegetation and are representative of the Grey Wooded and Brown Podzolic great soils groups. The valley and lower foothill portion of Ravalli County has been covered by a detailed standard soil survey. In this survey more than 300 distinct kinds of soils were identified and mapped. The report of this survey includes descriptions of the different kinds of soils, management groupings for various purposes such as cropland, rangeland, and woodland, and recommendations for use and management. This report will be published in the Standard Soil Survey Series under the title "Standard Soil Survey of the Bitterroot Valley Area, Montana," sometime in 1958. The information contained in the report will provide a good physical basis for planning the correct use and management of agricultural land in the area covered by the maps therein.

WATER SUPPLY

The Bitterroot River and its tributaries form the only drainage basin within the boundaries of Ravalli County. From its headwaters at the southern end of the county, the Bitterroot River follows a course northward through the central part of the valley into Missoula County, where it flows into the Clark Fork River (formerly called Missoula River) below the city of Missoula. Tributaries of the Bitterroot River rise in the Bitterroot Mountain Range on the west and Sapphire Mountains on the east, which supply water for irrigation of the bench and river bottom lands of the valley.

The Bitterroot area was one of the earliest developed agricultural valleys in Montana and has the distinction of having the oldest water right filing in the State. County records list an appropriation of water from Burnt Fork Creek, near the site of Fort Owen, in the year of 1852.

Almost all of the streams in Ravalli County are used for irrigation and have gone through the process of adjudication proceedings. These streams which are adjudicated include the Bitterroot River and

the following tributaries: West Fork Bitterroot River, East Fork Bitterroot River, Tolan Creek, Camp Creek, Hart's Gulch, Rye Creek, Chaffin Creek, Tin Cup Creek, Little Tin Cup Creek, Spoon Creek, Fern Creek, Lick Creek, McCarthy Creek, Lost Horse Creek, Camas Creek, Hayes Creek, Skalkaho Creek, Roaring Lion Creek, Sawtooth Creek, Sawmill Creek, Canyon Creek, Blodgett Creek, Tamarack Creek, Willow Creek, Holloran Gulch, Mill Creek, Tag Alder Creek, Cow Creek, South Fork Cow Creek, Sheafman Creek, Fred Burr Creek, Bear Creek, Spring Gulch, Sweathouse Creek, Smith Creek, North Fork Willoughby Creek, Big Creek, South Swamp Creek, Robertson Creek, North Swamp Creek, McCalla Creek, Sharratt Creek, Kootenai (Mill or Lyons) Creek, Mill Fork Creek, Burnt Fork Creek, Brooks Creek, Bass Creek, Larry Creek, Three Mile Creek, Wheelbarrow Creek, Gray Horse Creek, Sweeney Creek, One Horse Creek, Tie Chute Creek, and *Carlton Creek.

*Carlton Creek is located in Missoula County but has some water users diverting water for irrigation use in Ravalli County.

STREAM GAGING STATIONS

The U. S. Geological Survey measures the flow of streams, cooperating with funds supplied by several state and federal agencies. The results are published yearly in book form as Water-Supply Papers, the latest being for the year 1955. The later records may be obtained prior to publication from the U. S. Geological Survey. That agency's records and reports have been used in the preparation of this resume.

Data given below cover the stream gaging records which are available for Ravalli County from the beginning of measurements through the water year 1957. The water year begins October 1 and ends September 30 of the following year. A number of smaller reservoirs are referred to in the Water Resources Survey under the projects to which they belong, but only two, Como Lake and West Fork of Bitterroot River Reservoir are reported in this summary of stream gaging records.

Where diversions for irrigation above the gage are shown, the acreages have been estimated by the Geological Survey and may not necessarily agree with the final results of the Water Resources Survey.

Following are equivalents useful in converting from one unit of measurement to another:

- (a) In Montana, one cubic foot per second equals 40 miners' inches.
- (b) One acre foot is the amount of water required to cover an acre one foot deep.
- (c) One cubic foot per second will nearly equal two acre feet (1.983) in 24 hours.
- (d) A flow of 100 miner's inches will equal five acre feet in 24 hours.
- (e) One miner's inch flowing continuously for 30 days will cover one acre 1½ feet deep.

For reference purposes, the stream gaging stations are listed in downstream order beginning with headwaters of the Bitterroot River.

West Fork of Bitterroot River Reservoir Near Conner*

The dam, which is on the West Fork of Bitterroot River 7 miles upstream from Nezperce Creek and 23 miles south of Darby, was built by the State Water Conservation Board. The drainage area is 317 square miles. It has a storage capacity of 31,700 acre-feet and furnishes a supplemental water supply for 20,000 acres of land. Month-end reservoir contents as available have been published in U. S. Geological Survey water-supply papers from June, 1940, to date. Records have been furnished by the State Water Conservation Board.

West Fork of Bitterroot River Near Conner*

The water-stage recorder is half a mile downstream from West Fork Dam, 6 miles upstream from Nezperce Creek, and 16 miles southwest of Conner. The drainage area is 317 square miles. Records are available from April, 1941, to date. The maximum discharge was 4,060 cfs (May 9, 1947) and the minimum 0.6 cfs (May 3-7, 1954). The average discharge for 16 years (1941-57) was 295 cfs, or 213,600 acre-feet per year. The highest annual run-off was 297,300 acre-feet (1947) and the lowest was 115,900 acre-feet (1944). There are diversions for irrigation of about 200 acres above the station. The flow is regulated by the West Fork Bitterroot Reservoir.

West Fork Bitterroot River Near Darby

The chain gage was located 500 feet downstream from Trapper Creek ranger station, half a mile downstream from Trapper Creek and 10 miles south of Darby. The drainage area is 552 square miles. Partial records are available from Sept. 1910 to Sept. 1917. The maximum discharge was 6,730 cfs (June 17, 1917) and the minimum 106 cfs (Aug. 28 to Sept. 7, 1914). There are irrigation diversions above the station for about 600 acres.

East Fork Bitterroot River Near Conner*

The water-stage recorder is 10 feet below private bridge $4\frac{1}{2}$ miles southeast of Conner and 5 miles upstream from confluence with West Fork. The drainage area is 381 square miles. Records are available from April, 1956, to date. The maximum discharge was 3,000 cfs (May 25, 1956) and the minimum 51 cfs (Nov. 20, 1956). There are some diversions above station for irrigation.

East Fork Bitterroot River at Conner

The wire-weight gage was 200 feet downstream from highway bridge at Conner and half a mile upstream from confluence with West Fork. The drainage area at last location is 405 square miles. Fragmentary records are available from staff gage $2\frac{1}{2}$ miles upstream from Sept. 1910 to Sept. 1916; from several wire-weight gages from April 4, 1937 to Sept. 1953 in vicinity of the last gage which was operated from Oct. 1953 to Sept. 1957 when station was discontinued. The average discharge for 20 years (1937-57) was 257 cfs or 186,100 acre-feet per year. The maximum discharge was 3,760 cfs (May 29, 1948) and the minimum 5.5 cfs (Aug. 10, 1940). The highest annual run-off was 295,600 acre-feet (1947) and the lowest was 84,160 acre-feet (1940). There are diversions above the station for irrigation of about 3,000 acres.

Bitterroot River Near Darby*

The water-stage recorder is 25 feet downstream from bridge on U. S. Highway 93, a quarter of a mile downstream from Chaffin Creek, and 4 miles southeast of Darby. The drainage area is 1,049 square miles. Records are available from April, 1937, to date. The maximum discharge was 11,500 cfs (May 9, 1947) and the minimum 80 cfs (Feb. 9, 1939). The average discharge for 20 years (1937-57) was 899 cfs or 650,800 acre-feet per year. The highest annual run-off was 977,800 acre-feet (1947) and the lowest 350,600 acre-feet (1940). There are diversions above station to irrigate about 5,500 acres.

Como Lake Near Darby*

The staff gage is at dam on Rock Creek 4 miles northwest of Darby. The drainage area is 54.6 square miles. The reservoir has a usable capacity of 34,800 acre-feet. Month-end contents of reservoir have been published in U. S. Geological Survey publications from Oct. 1939, to date. Records have been furnished by Bitterroot Irrigation District.

Rock Creek Near Darby*

The water-stage recorder is 0.6 mile downstream from Como Lake, 0.7 mile upstream from Rock Creek Canal, and 4 miles northwest of Darby. The drainage area is 55.4 square miles. Records are available for parts of 1946-48, from Dec. 1948, to Sept. 1953 and from Aug. 30, 1957 to date. The maximum discharge was 1,580 cfs (June 17, 1950) and the minimum, no flow (at times in May and June, 1946 and Nov. 6, 1952 to April 5, 1953). Flow is regulated by Como Lake which has a storage capacity of 34,800 acre-feet. A small irrigation diversion is above station.

Rock Creek Canal (Bitterroot Irrigation District Canal) Near Darby

The water-stage recorder was at footbridge a quarter of a mile downstream from diversion dam, 1½ miles downstream from Como Lake and 4 miles northwest of Darby. Records are available for irrigation seasons of 1946 and 1948 through 1953. A staff gage was used prior to 1951. The maximum daily discharge was 407 cfs (Aug. 3, 1952). The canal diverts from Rock Creek for irrigation of land on the east side of the valley from Grantsdale to 8 miles north of Stevensville.

Bitterroot River Near Grantsdale

The chain gage was on the highway bridge two miles southwest of Grantsdale. The drainage area is 1,414 square miles. Records are available except for some of the winter months from May, 1902 through Dec. 1907. The maximum discharge was 12,900 cfs (June 3, 1903) and the minimum 5 cfs (Sept. 19-22, 1905). There are many diversions above the station for irrigation.

Skalkaho Creek Near Hamilton*

The water-stage recorder is 2 miles downstream from Daly Creek and 12 miles southeast of Hamilton. The drainage area is 87.8 square miles. Records are available from Dec. 1948, to Sept. 1953, and after Aug. 30, 1957. The maximum discharge was 812 cfs (June 21, 1950) and the minimum 15 cfs (Mar. 26-29, 1950). Flood of June 15, 1922, reached a discharge of 1,110 cfs at site 3 miles

downstream. The highest run-off during the four full years of record (1950-1953) was 87,810 acre-feet (1951) and the lowest 57,280 acre-feet (1953). Flow during irrigation season is supplemented by releases from Kent Lake and Dam Creek Lake (combined capacity 200 acre-feet). There are no diversions above the station.

Skalkaho Creek at Brennan's Ranch Near Hamilton

The staff gage was at a private bridge, about 1,000 feet south of ranch buildings, and 9 miles southeast of Hamilton. The drainage area is 96.2 square miles. Records are available from May, 1920 to Sept. 1924 except for winter months. The maximum discharge was 1,110 cfs (June 15, 1922) and the minimum 14 cfs (Mar. 26 to April 5, 1924). Flood of May, 1948, reached a discharge of 1,130 cfs measured by slope-area method at a point 2 miles downstream. There are no diversions above the station. Flow during irrigation season is supplemented by releases from Kent Lake and Dam Creek Lake (combined capacity, 200 acre-feet).

Blodgett Creek Near Corvallis*

The water-stage recorder is 4½ miles upstream from mouth and 7 miles southwest of Corvallis. The drainage area is 26.4 square miles. Records are available from Dec. 1946 to date. The average discharge for 10 years (1947-57) was 73.0 cfs or 52,850 acre-feet per year. The maximum discharge was 836 cfs (May 16, 1949) and the minimum 1.2 cfs (Nov. 9, 10, 23, 25, 1952). The highest annual run-off was 62,680 acre-feet (1948) and the lowest 42,510 acre-feet (1953). Flow is partly regulated at low stages by storage in High Lake and Blodgett Lake (combined capacity 900 acre-feet).

Blodgett Creek Near Hamilton

The wire-weight gage was on the highway bridge 1½ miles upstream from mouth and 2½ miles north of Hamilton. The drainage area is 29.2 square miles. Records are available for most of the months from May, 1938 to June, 1943. The maximum discharge observed was 678 cfs (May 26, 1942) and the minimum observed was 0.6 cfs (Aug. 3 and 9, 1942). There are many diversions for irrigation above the station.

Willow Creek Near Corvallis*

The gage is 800 feet downstream from Butterfly Ranger Station, half a mile downstream from Horn Ditch and 6 miles southeast of Corvallis. The drainage area is 22.4 square miles. A staff gage was read from May, 1920 to April, 1924. A wire-weight gage was installed in Sept. 1957 and has been read to date. The maximum discharge observed was 130 cfs (June 15, 1922) and the minimum, 3.6 cfs (Nov. 28 to Dec. 1, 1923; Mar. 23-25, 1924). There are two small irrigation diversions above the station. Release from Gleason Lake (capacity, 160 acre-feet) supplements natural flow during irrigation season.

Willow Creek at Anfinson Ranch Near Corvallis

The staff gage was at Anfinson Ranch, 5 miles southeast of Corvallis. The drainage area is 23.2 square miles. Records are available from May, 1938, through June, 1943. The maximum discharge

observed was 125 cfs (June 9, 1942) and the minimum 0.1 cfs (May 5-8 and Sept. 11, 1938; Aug. 13 to Sept. 13, 1939). The highest annual run-off was 8,730 acre-feet (1942) and the lowest 2,170 acre-feet (1941). There are many diversions above station for irrigation.

Fred Burr Creek Near Victor

The water-stage recorder was 5 miles upstream from mouth and 7 miles southwest of Victor. The drainage area is 18.4 square miles. Records are available from Dec. 1946 through Sept. 1951. A staff gage was used July 30 to Sept. 30, 1948. The maximum discharge was 23,000 cfs (May 28, 1948 due to failure of dam, measured 3 miles above station) and the minimum 2.7 cfs (Sept. 20-22, 1948). The flow was partly regulated by Fred Burr Lake (capacity 200 acre-feet) and prior to May 28, 1948, by Fred Burr Reservoir (capacity 515 acre-feet).

Bear Creek Near Victor*

The water-stage recorder is 4 miles upstream from mouth and 5 miles southwest of Victor. The drainage area is 26.8 square miles. Records are available from April 1938 through Dec. 1954 and Sept. 1957 to date. Prior to Aug. 28, 1941, a staff gage at same site was used. The maximum discharge was 1,340 cfs (June 16, 1950) and the minimum 0.7 cfs (Dec. 1, 1952). The average discharge for 16 years (1938-54) was 65.4 cfs or 47,350 acre-feet per year. The highest annual run-off was 62,660 acre-feet (1947) and the lowest 29,280 acre-feet (1944). There are no diversions above the station.

Kootenai Creek Near Stevensville*

The water-stage recorder is 3 miles upstream from mouth and 4 miles northwest of Stevensville. The drainage area is 28.9 square miles. Records are available from Dec. 1948 through Sept. 1953 and after Aug. 28, 1957. The maximum discharge was 1300 cfs (June 17, 1950) and the minimum 2.0 cfs (Nov. 30, 1952). There are no diversions above the station.

Burnt Fork Creek Near Stevensville*

The staff gage is 150 feet upstream from county road bridge 8 miles southeast of Stevensville. The drainage area is 74.0 square miles. Intermittent and partly estimated records are available. May 1920 through Sept. 1924 and May-June, 1938. Complete records are available Oct. 1938 to date. The average discharge for 19 years (1938-57) was 49.5 cfs or 35,840 acre-feet per year. The maximum discharge was 641 cfs (May 28, 1938) and the minimum 2 cfs (Mar. 11, 1948). The highest annual run-off was 57,220 acre-feet (1948) and the lowest was 17,990 acre-feet (1941). There are diversions above the station for the irrigation of about 2,000 acres. The flow is partly regulated during the irrigation season by release from Burnt Fork Lake (capacity, 510 acre-feet).

Bitterroot River at Florence*

The wire-weight gage is on bridge 1.3 miles east of Florence. The drainage area is 2,604 square miles. The station was established on Sept. 8, 1957. There are numerous diversions upstream from the gage.

Eightmile Creek Near Florence*

The water-stage recorder is about 0.1 mile above the corner post of secs. 2 and 3, T. 10 N., R. 19 W., 0.6 mile upstream from Granite Creek and 6 miles east of Florence. The drainage area is 20.6 square miles. The station was established Sept. 11, 1957. There are diversions downstream from the station.

Miscellaneous Discharge Measurements

Measurements of discharge at points other than regular gaging stations are made occasionally. These are reported in annual Geological Survey Water-Supply in lists at the end of each report.

A special series of miscellaneous measurements are being made during 1958 and 1959 on 18 streams in the Bitterroot Valley in connection with ground water studies now under way.

*These gaging stations are now in operation (1958).

MINING

Ravalli County, bisected by Bitterroot River, is bounded on the west by the crestline of the Bitterroot Range and on the east by the crestline of the Sapphire Range. The Bitterroot Range, which rises over 6,000 feet above the valley floor, and the Sapphire Range, which rises from 2,700 to over 5,000 feet above the Bitterroot Valley floor, are composed and underlain by Beltian sediments of Precambrian age intruded by granitic rocks of the Idaho batholith of Cretaceous age. Tertiary volcanic rocks occur locally, and the valley is filled with Tertiary lake beds and Pleistocene silts of glacial Lake Missoula and Recent alluvium. In southern Ravalli County, from Sleeping Child Creek southward to the extreme southern tip of the County, fine-grained quartz-feldspar-biotite gneisses and mica schists are locally exposed. These are thought to be pre-Belt in age because of their highly metamorphosed appearance.

Metalliferous prospects are scattered throughout the Sapphires and Bitterroot Ranges with the greater portion of metal production coming from the Curlew District west of Victor. Considerable placer gold was recovered from Hughes Creek area.

Metals recovered in Ravalli County include gold, silver, copper, lead, and zinc. Nonmetallics recovered include barite, clay, coal, fluorspar, pumicite, and vermiculite. The most productive of these deposits on any significant scale today is the Crystal Mountain fluorspar deposit east of Darby.

Curlew and Pleasant View District

The Curlew District lies three and one-half miles northwest of Victor and is accessible by a good graded road and the Bitterroot Branch of the Northern Pacific Railway. Although mining prospects with considerable development are abundant within the area, the Curlew mine has been the major producer. This mine has been developed and worked under various managements since 1887 for such recoverable metals as gold, silver, lead, zinc, and copper. The veins strike east-west in a hanging wall

of quartzite and a footwall of granite. The mine has operated intermittently from 1887 until 1949, and since then has reported no production.

The Pleasant View, Bluebird, and Bitterroot Prince mines are all in secs. 4 and 5, T. 7 N., R. 21 W. These mines were located on a silver vein about the year 1871. Production from these mines consisted principally of silver, lead, and copper. The last shipment on record came from the Pleasant View mine in 1939.

Early reports during the turn of the century carry reports of activity on the Ore Finder Group about five miles southwest of Victor, which carried gold, silver, and copper. The last report of activity on record from this mine was in 1910.

Eightmile District

The Eightmile District lies on Eightmile Creek, approximately eight miles east of Florence, through which pass U. S. Highway 93 and the Bitterroot Branch of the Northern Pacific Railway.

The District includes such mines as the White Cloud, Cleveland, L R, Annie Bell, and Providence, of which the White Cloud mine is the most notable. The White Cloud mine was discovered in 1866 and operated under various managements. The ore is pyritic iron carrying gold. The bedrock consists of Precambrian meta-sediments which also compose the hanging wall and footwall of the ore veins.

The Cleveland mine is on the crest of the Sapphire Mountains, 16½ miles by road east of Florence. Material on the dump is blocky blue-grey argillite with some white quartz containing specks of limonite, specular hematite, and magnetite. Minor amounts of brown carbonate, ankerite, or siderite are also present. The ore carried free gold.

Burnt Fork District

The Burnt Fork District consists of the Claremont and Iron Cap mines. The Claremont mine is on Claremont Creek in the NE¼, sec. 1, T. 8 N., R. 19 W., about 12 miles by road east of Stevensville. The mine adit, now caved, was driven into argillite. Vein material on the dump consisted of granular calcite with copper and iron oxides stained green by malachite.

The Iron Cap mine is near the head of Slocum Creek in sec. 30, T. 9 N., R. 18 W., about nine miles east of Stevensville by road. A shallow vertical shaft exposes a vein two feet wide which strikes N. 20° W. and dips vertical. The vein is composed of massive specular hematite with some limonite and quartz.

Overwich-Hughes Creek District

Overwich and Hughes Creeks are two westward flowing tributaries of the West Fork of the Bitterroot River, 29½ and 33 miles respectively by road south of Darby. Darby is also the terminus of the Bitterroot branch of the Northern Pacific Railway. This area is noted principally for its placer gold production.

Placer mining began in this area about 1870. Total gold and silver production since 1904 is valued at \$260,000, of which placers accounted for 98 percent and about five lode mines for the remainder.

The lode mines mentioned in production records are the Washington, Overwich, Jim and Star, and Baker-Brickley.

Mineral Point District

This District lies at the southernmost tip of Ravalli County approximately 43 miles south of Darby. The principal development is on the property of the Copper Canyon Mining Company on Woods Creek.

The country rock of the area is a gray- to greenish-gray thin-bedded, slaty, micaceous argillite and quartzite of the Ravalli group of the Belt series of Precambrian age. These rocks in the vicinity of the shaft have been intensely folded and contorted along a shear zone which strikes N. 45° W. and dips 64° E. This shear zone is mineralized by seams, stringers, and irregular masses of quartz, chalcopyrite, and bornite.

The Sheep Creek columbite deposit lies on the hillside east of Sheep Creek just above its junction with the West Fork of the Bitterroot River. A columbium-bearing mineral was discovered in a dike or vein. The ore is a pinkish- to brown carbonate rock containing stubby prismatic crystals of columbite. The wall rock of the vein is a fine-grained gneiss.

Sula District

The Sula District contains the beryl deposits which were discovered in 1954 by bulldozing operation in this area. These deposits are 2½ miles north of Sula in sec. 32, T. 2 N., R. 19 W., and easily accessible by an unimproved country road. The beryl is exposed in a pegmatite dike or cutting gneissic granite on a strike of N. 60° W. Beryl crystals within these pegmatites are blue-green in color.

Frog Pond Basin District

This District includes the Montana Prince in sec. 11, T. 3 N., R. 17 W., near the crest of the Sapphire Range and the Gold Leaf mine in sec. 14, T. 3 N., R. 17 W. The Montana Prince, now inaccessible, was in granodiorite and quartz monzonite as shown by dump material.

The Gold Leaf mine shipped some lead carbonate ore containing gold, silver, and copper. The last shipment was made in 1940. The vein strikes S. 79° E., dips 59° NE, and ranges in width from a few inches, to 3 feet in a country rock of granodiorite.

Nonmetallic Mineral Deposits

Clay: Many clay deposits have been found in this county. One of the largest deposits of clay is reported near Grantsdale and said to be a good pottery clay. Recorded tests indicate that it burns into a hard durable ware and takes an excellent glaze.

A white clay deposit has been reported from Blodgett Canyon near Hamilton.

Coal: The coal deposits of Ravalli County are in the southern part about 2½ miles north of Darby, and on Coal and Hughes Creeks. The coal is all lignite of Tertiary age. Notable among the coal mines of this area are the Nicholson and Wards mines. The coal may be found in seams ranging in thickness from 5 to 8 feet.

Fluorite: The Crystal Mountain fluorite deposits are on the Rye Creek-Sleeping Child divide in sec. 17 and 18, T. 3 N., R. 18 W. The fluorite occurs in two separate groups of outcrops 3,000 feet apart. The smaller Retirement group consists of two small elliptical outcrops about 60 feet wide and 150 feet long. Their attitude suggests erosional remnants of a flat-lying vein. The footwall consists of granite and fine-grained gray gneiss. The larger Lumberjack group of outcrops comprises several fairly large irregular closely spaced deposits in granite. These deposits are being mined by open-pit methods. The mining has disclosed these deposits to be flat-dipping, tabular-lenticular ore bodies with a southeasterly dip of 10° to 35°. This fluorite is exceptionally pure and remarkably uniform in appearance and quality, and ranges in color from pure white through pale green to deep purple.

Pumicite: The pumicite deposits are near Victor on the east side of the valley. A 70-foot high bank exposes 40 feet of clay, 8 feet of coarse but compact ash, 2 to 4 feet of very pure fine ash, and 18 to 20 feet of clay, gravel, and volcanic rock at the top.

Vermiculite: The vermiculite deposits are about 11 miles due east of Hamilton. The area is near the crest of the Sapphire Mountains at an elevation of 7,000 to 8,000 feet above sea level. The vermiculite occurs in an intrusion of pyroxenite which cuts impure limestone and argillite of the Newland formation of the Belt series of Precambrian age. Intrusive masses of syenite and pegmatite dikes are associated with the pyroxenite. The vermiculite occurs as disseminations and concentrations in the pyroxenite.

Uranium and Rare Earths: Uranium and rare earths have been found in southern Ravalli County. Exploration on uranium has been extensive on the Lucky Joe property on the West Fork of the Bitterroot River. Rare earth carbonates such as the mineral ancylite have been traced in various dike-like formations throughout the Mineral Point District. The dikes carrying the rare earth carbonates appear to crosscut the gneissic bedrock found in this area generally thought of as a highly metamorphosed meta-sediment older than Beltian rocks. The rare-earth carbonate, parisite, has been reported from the White Cloud mine on Eightmile Creek, and radioactive samarskite occurs in a quartz-feldspar-muscovite pegmatite on Rye Creek southeast of Darby.

BITTERROOT SOIL CONSERVATION DISTRICT

The Bitterroot Soil Conservation District boundaries are identical with those of Ravalli County. This District was organized under Montana State law in 1941 with headquarters at Hamilton, Montana. It is a legal sub-division of the State and was established by farm and ranch operators and owners of the area.

The District is governed by a Board of five Supervisors who are elected by the land occupiers within the District. They carry out a program of soil management, proper land use, resulting in soil

erosion control, water conservation and soil improvement. These Supervisors have the power under State law to call upon County, State, Federal and other agencies to assist in executing the District's program.

To date the District Supervisors have working agreements with the Soil Conservation Service for providing technical assistance, with the State Extension Service to provide educational assistance and with the U. S. Forest Service to provide technical assistance on forested lands. In addition they have requested and received assistance from Ravalli County, the Ravalli County Improvement Association and many local business firms.

With the assistance which the District Governing body secures from the various agencies and organizations, a work program is developed and carried out. The work program outlines the major soil and water conservation problems. It furthermore indicates the work needed to solve these problems. A work plan is prepared each year by the Governing body for the scheduling of actual activities which will be stressed and carried out during the year.

Each year the Bitterroot Soil Conservation District publishes an annual report in the three local papers showing the accomplishments of the District.

The District directly assists farmers and ranchers on a voluntary basis in planning and applying conservation to the land. This technical assistance is provided without cost to the farm or ranch operator who must formally request this assistance from the District.

In Ravalli County there are about 1,000 farmers and ranchers operating about 360,000 acres. There are a total of 1,542,068 acres of land in the County. Over 75% of this is publically owned. The District provides assistance only on privately owned land.

Considerable technical assistance is provided farm and ranch operators to develop basic conservation plans for their land. These plans include detailed soil surveys, range site and condition surveys, forest site surveys and other surveys mostly of the engineering type. The various surveys indicate the kind and amount of conservation work needed to prevent erosion and to develop the resources of the farm or ranch to the maximum. Conservation planning is done with individuals or groups of farmers and ranchers working jointly with the Soil Conservation Service technician assisting the District. The farmers or ranchers make the final decisions recorded in the conservation plan based on various surveys and the counsel of the technicians.

On irrigated land the assistance is given primarily on irrigation systems, land leveling, drainage, water control structures, sprinkler irrigation systems, proper application of irrigation water, water storage, soil management, crop rotations and irrigated pasture management.

On dry lands technical assistance is given primarily on reseeding methods. On range land technical assistance is given on deferred grazing, proper utilization, range reseeding, and livestock water development. On woodlands most assistance is for timber stand improvement and adopted cutting methods.

Since the District has been operating, over seventy-seven miles of irrigation canals have been constructed or improved, employing about 480 water control structures, thus improving the irrigation on

about 14,000 acres. Fifty miles of drain ditches have improved 3,500 acres of formerly seeped land to the point where they now can be cropped successfully. 4,316 acres of land have been leveled so that they may be irrigated properly.

About 5,000 acres have been seeded and are being managed in irrigated pastures. An additional 3,800 acres of dryland has been seeded for seasonal pastures. These improvements have resulted in better balanced wildlife habitat.

The District presents an annual Conservation Day to which all farmers, ranchers and other interested individuals are invited. The program consists of a presentation and discussions relating to the local resource problems.

Excellent progress has been achieved in attaining sound land use. The completion of a basic soils survey of the private lands in the District has been invaluable for furnishing basic data for the conservation program. Cooperative efforts of the landowner and operators and other groups and agencies have contributed to the success of the District. There has also developed a public realization of the importance of Community action in solving the basic resource problems of the Area.

STATE FISH CULTURAL STATION

For purposes of providing fish for the waters of the Bitterroot Valley, the Marcus Daly estate, in late 1919 began the construction of the Daly fish hatchery about two miles east of Grantsdale. Upon completion, this plant was operated as a private enterprise for a few years, then it was leased and operated by the State for a period of 10 years. At the expiration of the lease, the State Fish and Game Department purchased the plant for \$4,500.00 from the Daly estate. The transaction was recorded on June 26, 1933. The transfer included 7.29 acres and certain rights of way for roads and a pipe line. It also included another tract of land of 2.13 acres in the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 9, T. 5 N., R. 20 W. which was located about 2,000 feet east of the hatchery site. This latter tract contains sub-surface springs which constituted the original water supply for the hatchery. A 12-inch wooden pipe line delivers water by gravity from this source.

During the late 1930's, the State, assisted by the W. P. A. Administration, built a series of improvements and enlarged facilities to promote greater production for the station. The prime project of the time, was the excavation and rip-rapping of four large dirt ponds. On completion of this project, the water supply from the spring source was far from being adequate to maintain a water level in these ponds, despite the fact that every possible effort had been made to develop additional water through trapping springs and laying drain tile in adjacent fields around the 2.13 acres mentioned before.

Early in 1936, it was learned that the Montana Power Company was planning to dispose of its water rights on Skalkaho Creek, and replace the water system in Hamilton with pumping units by digging a series of wells. The Fish and Game Department was interested in acquiring a part of the water rights, plus the pipe line, in view of the fact, this water line ran through the immediate hatchery grounds. Lengthy negotiations with the Montana Power Company failed to produce any satisfactory conclusion, and the entire well and Skalkaho Creek water systems for Hamilton, were eventually purchased by the Valley Water Company, a private Hamilton concern. During the years following the dis-

continuance of the Skalkaho as the Hamilton city water supply, chlorination of the water was stopped and its use was made possible by the hatchery through agreement reached by the State, and owners of the pipe line and water right.

Additional building improvements added since the hatchery was obtained, include a three-stall garage with adjoining shop, and a foreman's residence constructed in 1940. A small section of the original hatchery building contained some living quarters which have also been renovated to provide living quarters for any assistants assigned to the station.

During 1950, ten concrete raceway type tanks, 25 feet long by 3 feet wide and 3 feet deep, were constructed in the west end of the hatchery building. In the spring of 1952, nine more similar tanks were constructed in the remainder of the building. These tanks replaced the original 80 small type (cement) hatching and rearing troughs, 12 feet long, 16 inches wide and 8 inches deep. This change was in line with other similar projects at other installations during this period.

The Hamilton Fisheries Station is generally regarded as one of our colder water stations, since the Skalkaho Creek water undergoes extreme temperature drops in winter. The so-called spring water supply retains a near constant temperature of 47 degrees during colder weather. Through the years of operating the Hamilton Fisheries Station, it has successfully propagated Eastern Brook, Loch Leven, Rainbow and Black Spotted trout. Some experiments have been conducted with the California Golden trout with varying success. Latest management practices indicate a bright picture for the future in its operation.

BITTERROOT NATIONAL FOREST

The Bitterroot was one of our early forest preserves. The proclamation which created it was signed by President Cleveland on February 22, 1897. Most of the original forest was in Idaho. It included all of the Selway area, and much of the Salmon River country. The Montana portion of the early preserve consisted only of the area south of the Sula Basin, and the higher west side, or Bitterroot Range. It was not until 1905, when the forest preserves became national forests, that the Bitterroot Forest absorbed much of what was the old Hellgate Forest, and its present boundaries came into existence.

There are now approximately 1,188,000 acres of the Bitterroot National Forest in Montana. Nearly all of the Montana portion of the forest lies in Ravalli County (approximately 1,175,000 acres), with only about 13,000 acres in Missoula County. Since about 71% of the entire land area of Ravalli County lies within the boundaries of the Bitterroot National Forest, and since Ravalli County is predominately agricultural, dependent largely on irrigation, it is obvious that water is the most important resource of the Bitterroot National Forest.

The history of Ravalli County and of the Bitterroot National Forest is of great interest. Here civilization gained its first foothold in what is now the State of Montana, when St. Mary's Mission was established at Stevensville in 1841. Here also, water was first used for irrigation in Montana. Father Anthony J. Ravalli, for whom the county is named, first taught the Indians how to irrigate their crops, and then used the abundant water in another way, when he built for them the State's first grist mill and

taught the Indians how to make bread from their grain. Not many years later, in 1852, Major John Owen acquired the first water right in Montana when he diverted water from Burnt Fork Creek for his own special use.

The settlers who followed in the wake of the trappers, missionaries, and Trader Owen, acquired their water rights by appropriating water from the many tributary streams that flow into the Bitterroot. This was before the Bitterroot National Forest was established. Many of the existing water rights in Ravalli County date back to these earliest days of settlement.

The first ranger station in the United States was built on the Bitterroot National Forest in 1899. This was at Alta, in the West Fork country, and the old log building constructed by N. E. Wilkerson and H. C. Tuttle, two of the early rangers on the forest, still stands as a memorial to their pioneering efforts. The early Rangers recognized the value of the water resource. Forest files contain many inspection reports these men wrote on the small reservoirs created by dams on some of the small upland lakes.

There is one case in the old files that is of particular interest. In 1909, several parties made application to divert the waters of Bear Creek in Idaho which drained the country west of Lost Horse on the Idaho-Montana Divide, over into the Lost Horse Creek drainage in Montana. They planned to irrigate lands in the Charlos Heights District, which at that time was being promoted as orchard land. The right-of-way for the necessary ditch to carry the water from Bear Creek to Lost Horse was granted by the Forest Service to the applicants, but only on condition that the State of Idaho would allow its water to be diverted into Montana. Idaho, however, would not allow its water to be diverted, so the permit was cancelled. This may be one of the earliest cases on record of a State zealously guarding its water. It points up the fact that water in a stream on public lands, such as the national forests, is owned by the State. However, the Forest Service, as custodian of the land, does have the right under law to issue permits for the building and inspections of dams and right-of-way diversions so that they will conform to the rules of safety, practicability, and good land use.

Most of the water impoundments in Ravalli County are located on national forest land where the water originates. Every year the ranger, in whose district one or more of these dams exists, must inspect them, and the supervisor or one of his staff, must also make such an inspection every three years. This is necessary to assure that the dams remain in good condition and do not menace the safety of those who live below them.

The Forest Service recognizes the right of the State and its citizens to use the waters that originate or exist on the forest. This is one of the many uses of the national forest. As pointed out earlier, one of the principal reasons for setting aside the forest preserves was to protect these watersheds for the benefit of all the people over the longest period of time.

It must be admitted however, that despite this early concern for watershed protection, there is still a lack of adequate knowledge on how best to care for our vital watersheds. Such knowledge comes only through research and experimentation. In recent years with the greater recognition of the vital importance of water, progress has been made and more progress should certainly be made in years to come.

Forests like the Bitterroot provide for multiple use of our natural resources. Logging is a principal industry in Ravalli County, and most of the income derived from logging in this county now comes from national forest timber. In logging off the private lands in years past, there was too little thought given to the land itself. As a result, much of this land lost its protective cover and has eroded badly. Some of it has since been acquired by the Forest Service through exchange for other lands, and work has been started to rehabilitate the cutover land.

A watershed rehabilitation program has now been started on one area. In this program the water will be returned to the original creek channels; the channels will be cleared of debris to reduce side thrust; some coffer dams will be built, especially in the draw bottoms; deep gullies will be filled with logs and other debris to arrest water flow; ditches will be outsloped to spill and prevent the formation of large heads of water; all roads and skid trails which are not on acceptable grades will be brushed in and seeded to grass; and a ponderosa pine tree planting program will be started.

Man has not been the only cause for watershed deterioration on the Bitterroot National Forest. Recognizing this, the Forest Service in cooperation with the State Fish and Game Department, has formulated a Sula District Wildlife Habitat Plan. Based on study and research it is hoped that these damaged lands can be rehabilitated and game populations adjusted to satisfactory numbers compatible with habitat and the continuance of good sport hunting. Test plot enclosures will be built to study range conditions, and there will be some clear cutting of timber in small blocks to provide more feeding grounds for game.

Similar plans will be made for the other four Montana districts on the Bitterroot National Forest. The primary goal of these plans will be to maintain and improve conditions on the vital watershed areas, while at the same time recognizing the value of the game itself. This will make it possible to have both game and healthy watershed conditions.

Ravalli County has long been noted for its excellent hunting and fishing and its other recreational assets. Recreation is a legitimate use of the forest, and it is a use which is growing in importance with each passing year. Some "Operation Outdoors" money has been made available to the Bitterroot Forest to begin rehabilitating a number of its old campgrounds and to make plans for the construction of new camping areas. These camping facilities are badly needed on the forest to better accommodate the increasing number of recreationists, and incidently, will help in no small way to stabilize the economy of Ravalli County. By providing more of these camping facilities for our forest visitors we can also assure better protection of the forest.

Fire control is important on the forest and each year in the county we must combat some 100 fires. Through the development and a better application of fire fighting science, with more modern tools and improvements, we have been able to keep fire losses to a minimum. However, the threat of disastrous fires is always present during the dry summer months. The pine beetle, during the 1920's and 1930's destroyed thousands of acres of lodgepole pine timber which has now dried and fallen, and constitutes a highly dangerous fire potential during the extremely dry years.

Grazing is another use of the forest. There are a considerable number of livestock permits on forest land and these are essential to the county's ranching economy. This use, carefully regulated, has proven to be comparable to the other uses on the Bitterroot National Forest.

Mining use on the forest has increased in recent years, due to the demand for new strategic metals, such as columbium and titanium. A fluorspar mine has proven to be a real boost to the county economy in providing new jobs.

There is no serious flood damage in Ravalli County, providing that most of the land area is in good condition. Diverting and storing the water to best advantage is still a problem that needs further study. We may need to build more storage dams in the right places where they will not harm the agricultural economy and to better regulate the flow of water in our valuable fishing streams.

The Bitterroot National Forest has a total of 11 campgrounds with 49 family camping units and four picnic units. Use of these camping and picnic areas this year was 13,000 visits for a total of 18,000 man-days. In addition, many hunters and fishermen camp outside of these established camping and picnic areas.

Counties containing national forest acreage receive 25% of the earnings from timber sales, grazing and other commercial uses of the national forest. An additional 10% is used locally for the maintenance and construction of roads and trails. For fiscal year 1957, Ravalli County received \$36,072.25, a significant contribution to county school and road funds.

SUMMARY OF IRRIGATED LAND BY RIVER BASINS IN THE
FOLLOWING COUNTIES COMPLETED TO DATE

Big Horn, Broadwater, Carbon, Custer, Deer Lodge, Gallatin, Golden Valley, Jefferson, Lewis & Clark,
Madison, Meagher, Musselshell, Park, Ravalli, Rosebud, Silver Bow, Stillwater, Sweet Grass,
Treasure, Wheatland and Yellowstone

RIVER BASIN	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Missouri River Drainage Basin			
*Missouri River	71,442.00	16,476.00	87,918.00
Jefferson River	61,291.00	9,713.00	71,004.00
Beaverhead River	40,771.00	6,076.00	46,847.00
Big Hole River	23,775.00	1,950.00	25,725.00
Madison River	39,445.00	7,660.00	47,105.00
Gallatin River	111,914.00	21,097.00	133,011.00
Smith River	30,304.00	18,398.00	48,702.00
Sun River	11,157.00	2,313.00	13,470.00
Musselshell River	64,789.00	57,870.00	122,659.00
Grand Total Missouri River Basin	454,888.00	141,553.00	596,441.00
Yellowstone River Drainage Basin			
Yellowstone River	299,053.00	96,088.00	395,141.00
Stillwater River	27,489.00	16,403.00	43,892.00
Clarks Fork River	91,768.00	24,195.00	115,963.00
Big Horn River	65,395.00	25,579.00	90,974.00
Tongue River	22,137.00	7,479.00	29,616.00
Powder River	8,264.00	1,804.00	10,068.00
Grand Total Yellowstone River Basin	514,106.00	171,548.00	685,654.00
Columbia River Drainage Basin			
Clark Fork (Deer Lodge, Hellgate, Mis- soula) River	17,535.00	1,988.00	19,523.00
Bitterroot River	104,569.43	2,799.00	107,368.43
Grand Total Columbia River Basin	122,104.43	4,787.00	126,891.43
Grand Total in the Counties Completed to Date	1,091,098.43	317,888.00	1,408,986.43

*Names of streams indented on the left-hand margin indicate that they are tributaries of the first stream named above which is not indented.

IRRIGATION SUMMARY OF RAVALLI COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
*Clark Fork Columbia River	0	0	0
Bitterroot River	22,830.37	562.00	23,392.37
West Fork Bitterroot River	673.00	0	673.00
Chicken Creek	58.00	0	58.00
Hughes Creek	5.00	0	5.00
Coal Creek	30.00	0	30.00
Rombo Creek	37.00	0	37.00
Nezperce Fork	0	0	0
Little West Fork	0	0	0
Soda Springs (Bailey) Creek	55.00	0	55.00
Nelson Creek	85.00	0	85.00
Ward (Pitney) Creek	35.00	0	35.00
Boulder Creek	0	0	0
Boulder Lake	20.00	0	20.00
Christisen Creek	20.00	15.00	35.00
Lloyd or Selsig Creek	30.00	0	30.00
Piquett Creek	30.00	15.00	45.00
House Creek	1.00	0	1.00
Baker Creek	27.00	0	27.00
Pierce Creek	60.00	0	60.00
Trapper Creek	15.00	0	15.00
Unnamed Sloughs	28.00	12.00	40.00
Learens Gulch	5.00	0	5.00
Total West Fork and Tributaries	1,214.00	42.00	1,256.00
East Fork Bitterroot River	1,863.00	70.00	1,933.00
Dowling Creek	3.00	0	3.00
Mink Creek	15.00	0	15.00
Tolan Creek	39.00	38.00	77.00
Waste	54.00	0	54.00
Reimel Creek	128.00	0	128.00
Camp Creek	518.00	9.00	527.00
East Fork Camp Creek	0	0	0
Warm Springs	18.00	8.00	26.00
Waugh Gulch	9.00	0	9.00
Cameron Creek	255.00	4.00	259.00
Doran Creek	3.00	0	3.00
Unnamed Creek	2.00	0	2.00
Waste	10.00	0	10.00

*Names of streams indented on the left-hand margin indicate that they are tributaries of the first stream named above which is not indented.

IRRIGATION SUMMARY OF RAVALLI COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)

East Fork Bitterroot River (Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Bear (Lyman) Creek	7.00	0	7.00
Clough Springs	0	5.00	5.00
Sula Creek or Placer Gulch	29.00	0	29.00
Medicine Tree Creek	5.00	0	5.00
Dickson Creek	10.00	0	10.00
Williams or Spade Creek	30.00	0	30.00
South Fork Williams or Spade Creek	56.00	0	56.00
Total East Fork Bitterroot River	3,054.00	134.00	3,188.00
Sump Pits	105.00	20.00	125.00
Waste	13.00	0	13.00
Rye Creek	101.00	0	101.00
South Fork Rye Creek	0	0	0
Northeast Fork of South Fork Rye Creek	10.00	10.00	20.00
Lowman Creek	7.00	0	7.00
Waste	41.00	0	41.00
Chaffin Creek	1,589.00	19.00	1,608.00
Unnamed Springs	30.00	0	30.00
Cooper Draw	8.00	0	8.00
Deer Hollow	1.00	0	1.00
McCoy Creek	16.00	0	16.00
Tin Cup Creek	2,078.21	8.00	2,086.21
Spoon Creek	55.00	0	55.00
Fern Creek	219.17	0	219.17
Blacktail Gulch	0	0	0
Unnamed Spring	7.00	0	7.00
Unnamed Slough	5.00	0	5.00
Burke Gulch	0	7.00	7.00
Unnamed Springs	0	1.00	1.00
Wells	4.00	0	4.00
Southwick Creek	9.00	0	9.00
Waste	70.00	0	70.00
Waste	6.00	0	6.00
Bunkhouse Creek	39.00	0	39.00
Waste	14.00	0	14.00
Unnamed Springs	29.00	0	29.00
Unnamed Spring	3.00	0	3.00
Overturf Gulch	0	0	0

IRRIGATION SUMMARY OF RAVALLI COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Unnamed Spring	11.00	0	11.00
Waste	10.00	0	10.00
Wells	3.00	0	3.00
Waste	54.00	0	54.00
Well50	050
Rock Creek	18,017.20	102.50	18,119.70
Como Lake	0	0	0
Little Rock Creek	732.00	0	732.00
Lick Creek	34.00	1.50	35.50
Lost Horse Creek	1,196.00	183.00	1,379.00
Moose Creek	0	5.00	5.00
McKinney Gulch	1.00	0	1.00
Camas Creek	778.00	24.00	802.00
Coyote Creek	5.00	0	5.00
Hayes Creek	210.00	20.00	230.00
Unnamed Spring	3.00	0	3.00
Waste	28.00	0	28.00
Sleeping Child Creek	725.00	6.50	731.50
Little Sleeping Child Creek	99.00	0	99.00
Jack Creek	3.00	0	3.00
Waste	14.00	10.00	24.00
Skalkaho Creek	5,772.48	176.50	5,948.98
Newton Creek	2.00	0	2.00
Unnamed Springs	5.00	0	5.00
Crabbe Gulch	10.00	0	10.00
Unnamed Spring	3.00	0	3.00
Waste	54.00	0	54.00
Wells	9.00	0	9.00
Roaring Lion Creek	1,155.50	454.00	1,609.50
Unnamed Sloughs	0	20.00	20.00
Snake Creek	10.00	0	10.00
Unnamed Sloughs	4.00	0	4.00
Sawtooth Creek	252.00	9.00	261.00
Owings Creek	130.00	0	130.00
Sawmill Creek	20.00	0	20.00
Unnamed Spring	1.00	0	1.00
Canyon Creek	1,124.00	144.00	1,268.00
Unnamed Draw	5.00	0	5.00
Well	1.00	0	1.00
Romney or Putnam Gulch	5.00	0	5.00
Well	6.00	0	6.00

IRRIGATION SUMMARY OF RAVALLI COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Spasoff-Hughes Spring	1.00.....	0.....	1.00
Unnamed Slough	50.00.....	40.00.....	90.00
Unnamed Springs	6.00.....	0.....	6.00
Waste	60.00.....	0.....	60.00
Unnamed Drain Ditch	8.00.....	0.....	8.00
Girds Creek	702.00.....	43.00.....	745.00
Waste	135.00.....	33.00.....	168.00
Unnamed Springs	10.00.....	0.....	10.00
Unnamed Drain Ditch	50.00.....	0.....	50.00
Waste	27.00.....	0.....	27.00
Blodgett Creek	1,774.00.....	10.00.....	1,784.00
Well	9.00.....	0.....	9.00
Churn Creek	0.....	5.00.....	5.00
Tamarack Creek	6.00.....	5.00.....	11.00
Well	35.00.....	0.....	35.00
Waste	53.00.....	0.....	53.00
Unnamed Creek	13.00.....	0.....	13.00
Cow or Chief Baptiste Creek	8.00.....	0.....	8.00
Waste	38.00.....	0.....	38.00
Wells	75.00.....	0.....	75.00
Willow Creek	1,735.00.....	0.....	1,735.00
North Fork Willow Creek	17.00.....	0.....	17.00
Waste	3.00.....	0.....	3.00
Little Willow Creek	10.00.....	0.....	10.00
Cow or Collins Creek	100.00.....	0.....	100.00
Holloran Drain Ditch	30.00.....	0.....	30.00
Charley's Gulch	55.00.....	0.....	55.00
Willow Creek Drain	235.00.....	29.00.....	264.00
Well	13.00.....	0.....	13.00
Waste	25.00.....	0.....	25.00
Coal Pit Hollow	0.....	0.....	0
Waste	100.00.....	0.....	100.00
Keffler-Kennedy-Holloran Drain Ditch	40.00.....	0.....	40.00
Soft Rock Creek	21.00.....	0.....	21.00
Well	40.00.....	0.....	40.00
Waste	24.00.....	0.....	24.00
Dry Gulch	0.....	0.....	0
Unnamed Springs	16.00.....	0.....	16.00
Holloran Gulch	95.00.....	0.....	95.00
Unnamed Creek	6.00.....	0.....	6.00

IRRIGATION SUMMARY OF RAVALLI COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigated Acres
Waste	57.00	0	57.00
Mill Creek	2,669.00	69.00	2,738.00
Unnamed Gulch	10.00	0	10.00
Tag Alder Creek	8.00	32.00	40.00
Browning or McRae Creek	90.00	0	90.00
Middle McRae Creek	8.00	0	8.00
Unnamed Gulch	12.00	0	12.00
Cow Creek	69.00	0	69.00
South Fork Cow Creek	30.00	0	30.00
Sage Creek	5.00	0	5.00
Sheridan Gulch	8.00	0	8.00
Sheafman Creek	734.00	148.00	882.00
Bourne Gulch	23.00	0	23.00
Unnamed Draw	10.00	0	10.00
Fred Burr Creek	2,569.00	42.00	2,611.00
Unnamed Spring	8.00	13.00	21.00
Unnamed Swamps	87.00	0	87.00
Waste	10.00	0	10.00
Total Mill Creek & Tributaries	6,508.00	304.00	6,812.00
Waste	138.00	0	138.00
Wells	130.00	0	130.00
Coyote Gulch	0	10.00	10.00
Waste	3.00	0	3.00
Unnamed Slough	65.00	0	65.00
Waste	68.00	0	68.00
South Birch Creek	0	0	0
Waste	9.00	0	9.00
Crooked Creek	46.00	0	46.00
Unnamed Gulch	16.00	0	16.00
Well	34.00	0	34.00
Bear Creek	3,076.00	49.00	3,125.00
Unnamed Spring	0	62.00	62.00
North Channel Bear Creek	0	0	0
Waste	26.00	0	26.00
Woodmancy Slough	66.00	0	66.00
Waste	66.00	0	66.00
Humble Drain Ditch	564.00	0	564.00
Bunkhouse Creek	20.00	10.00	30.00
Unnamed Sloughs	52.00	0	52.00
Birch or Simmons Creek	44.00	0	44.00

IRRIGATION SUMMARY OF RAVALLI COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Branch Creek	34.00	0	34.00
Kirchner Slough	30.00	0	30.00
Waste	6.00	0	6.00
Unnamed Slough	83.00	0	83.00
Spooner Creek	25.00	0	25.00
Spooners Dry Gulch	45.00	0	45.00
Spring Gulch	5.00	0	5.00
Sweathouse Creek	1,587.00	27.00	1,614.00
Gash Creek	942.00	0	942.00
Smith Creek	286.00	0	286.00
Waste	39.00	0	39.00
Willoughby Creek	30.00	0	30.00
South Fork or Davis Creek	22.00	0	22.00
McIntyre Reservoir	2.00	0	2.00
Spring Creek	4.00	0	4.00
Goose Neck Branch	10.00	0	10.00
Waste	2.00	2.00	4.00
Waste	22.00	0	22.00
Big Creek	2,715.00	0	2,715.00
Whippoorwill Gulch	6.00	0	6.00
Waste	2.00	0	2.00
Waste	4.00	0	4.00
Unnamed Slough	0	16.00	16.00
Freece Gulch	0	2.00	2.00
South Swamp Creek	736.00	5.00	741.00
Sump	5.00	0	5.00
Robertson Creek	614.00	0	614.00
Waste	90.00	0	90.00
North Swamp Creek	524.00	0	524.00
Sapiel Creek	138.00	0	138.00
McCalla (McKellar) Creek	668.00	0	668.00
Waste	19.00	0	19.00
Shallow Creek	0	0	0
Waste	5.00	0	5.00
Westler Gulch	9.00	0	9.00
Unnamed Creek	6.00	0	6.00
Unnamed Spring	30.00	0	30.00
Silverthorn Creek	111.00	0	111.00
Waste	40.00	0	40.00
Foust Well	41.00	0	41.00
Kennedy Creek	149.00	0	149.00

IRRIGATION SUMMARY OF RAVALLI COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Million Gulch	37.00	0	37.00
Sharratt Creek	678.00	10.00	688.00
Kootenai Creek	1,674.00	25.00	1,699.00
Total McCalla Creek & Tributaries	3,467.00	35.00	3,502.00
Drogitis Well	5.00	0	5.00
Mill Fork Creek	71.00	0	71.00
Burnt Fork Bitterroot River	5,484.00	28.00	5,512.00
Sawmill Creek	16.00	0	16.00
Haacke Creek	25.00	0	25.00
Clairmont Creek	17.00	0	17.00
South Burnt Fork Creek	125.00	0	125.00
North Burnt Fork (Spring) Creek	410.00	0	410.00
Waste	172.00	0	172.00
Brooks Creek	371.00	0	371.00
Waste	230.00	0	230.00
Unnamed Creek	80.00	0	80.00
Unnamed Slough	86.00	0	86.00
Bass Creek	2,469.00	28.00	2,497.00
South Channel Bass Creek	0	0	0
Waste	152.00	0	152.00
North Channel Bass Creek	0	0	0
Larry Creek	29.00	0	29.00
Rogman Creek	19.00	0	19.00
Swamp Creek	139.00	57.00	196.00
Three Mile Creek	554.00	0	554.00
Wheelbarrow Creek	0	0	0
Gray Horse Creek	15.00	0	15.00
Ambrose Creek	61.00	0	61.00
Unnamed Creek	126.00	0	126.00
Unnamed Springs	6.00	0	6.00
Unnamed Springs	50.00	0	50.00
Dry Gulch	34.00	0	34.00
Waste	20.00	0	20.00
Waste	57.00	0	57.00
Unnamed Spring	20.00	0	20.00
Sweeney Creek	1,496.00	0	1,496.00
Barnaby Creek	170.00	0	170.00
Eight Mile Creek	315.00	40.00	355.00
Waste	28.00	0	28.00

IRRIGATION SUMMARY OF RAVALLI COUNTY BY RIVER BASINS

COLUMBIA RIVER BASIN—(Continued)	Present Irrigated Acres	Irrigable Acres Under Present Facilities	Maximum Irrigable Acres
Childs Creek	101.00	0	101.00
One Horse Creek	1,107.00	0	1,107.00
Waste	249.00	0	249.00
Tie Chute Creek	82.00	0	82.00
Woodchuck Creek	108.00	0	108.00
Carlton Creek	90.00	0	90.00
Total Bitterroot River & Tributaries	104,569.43	2,799.00	107,368.43
Total Columbia River Basin	104,569.43	2,799.00	107,368.43
Total Irrigation in Ravalli County	104,569.43	2,799.00	107,368.43

BASS LAKE RESERVOIR COMPANY

HISTORY

The Bass Lake Reservoir Company project consists of a dam and storage reservoir to provide a water supply for irrigation of lands at the lower end of Bass Creek. The company was first incorporated on July 16, 1918, for a forty year period of existence and on April 9, 1952, the articles of incorporation were amended for a period of continued existence. At the same time the amount of capital stock was changed from 80 shares, at \$12.50 per share to 3,500 shares, at a par value of \$40.00 each. The original stockholders in the company were John Wimett, C. E. Adams, George F. Brooks, Peter O'Hare, and Aaron Crump. The stock of this company was declared assessable for the expense of repair, maintenance and operation, and for payment of any indebtedness of the company's system.

PRESENT STATISTICS

Location: Bass Creek Lake is located in parts of secs. 25 and 36, T. 10 N., R. 22 W. and secs. 30 and 31 in the unsurveyed area of T. 10 N., R. 21 W. After the water is released from the reservoir into Bass Creek it is picked up and used by individual ditch systems for the irrigation of land in secs. 3, 4, 5, 8, 9, 10, and 15, T. 9 N., R. 20 W. and secs 33 and 34, T. 10 N., R. 20 W.

Size and Capacity of Reservoir: On June 27, 1952, the Bass Lake Reservoir Company petitioned the court for a decreed water right of 2,000 acre-feet for intended storage purposes. This amount (2,000 acre-feet) is in addition to the original 1,629 acre-feet of storage. By raising the dam, the company increased the storage 1,371 acre-feet and at the present time the reservoir has a maximum storage capacity of 3,000 acre-feet. The drainage area above the reservoir is 1.4 square miles, with the lake covering an area of 100 acres.

Operation and Maintenance: O. and M. charges during the year of 1956, totaled \$2,000.00 for necessary repair work on the dam and removing logs and debris. The cost in 1955 for O. and M. was excessive and will not occur every year. For a normal year the total charges for O. and M. will average about \$500.00. Assessments for O. and M. are based on the number of shares owned by members of the reservoir company. One share of stock in this company is equal to one acre-foot of water. In normal years the water stored in the reservoir is sufficient for three irrigation periods, which usually begin in the latter part of July and end by September 15th.

Present Users: The number of actual shares owned in the company totals 1,785 which are divided among 8 water users.

Acreage Irrigated: In 1957 this reservoir company furnished a full and supplemental water supply to 2,383 acres of land.

WATER RIGHT DATA

The Bass Lake Reservoir Company has the following water rights appurtenant to the irrigation project: Decreed to the Bass Lake Reservoir Company 1,629.72 acre-feet of Bass Creek (Lake) dated January 1, 1913. (Ref. Bass Creek (Lake) Decree, Case No. 6612, Ravalli County Courthouse). The company also petitioned the court for a decreed water right of 2,000 acre-feet on June 27, 1952, with

the date of priority in effect at the time of completion of the dam for the 2,000 acre-feet of additional storage. (Ref. Bass Lake Decree, Case No. 8562, Ravalli County Courthouse). (See Maps in Part II, Pages 29 and 31).

BIG CREEK LAKES RESERVOIR ASSOCIATION

HISTORY

This irrigation project consists of a dam and reservoir for the storage of water in Big Creek Lakes at the headwaters of Big Creek. A U. S. Forest Service permit was issued to the association for construction of the project on July 28, 1906, and the dam completed in the fall of the same year.

The purpose was to furnish a supplemental water supply to the water users in the vicinity of Big Creek below the canyon.

On March 19, 1915, the Big Creek Lakes Reservoir Association was incorporated for a period of forty years. Among the first stockholders in the corporation were George A. Blair, H. J. St. John, and C. S. Parkhill. The capital stock of the corporation totaled \$25,000.00, which was divided into 2,500 shares at a par value of \$10.00 per share. The stock of this corporation was declared to be assessable. On September 19, 1955, the association filed a declaration of intention to avail itself of the right of continual succession.

PRESENT STATISTICS

Location: Big Creek Lakes are located in sec. 5 in the unsurveyed area of T. 8 N., R. 22 W. and parts of secs. 33 and 34 in the unsurveyed area of T. 9 N., R. 22 W. Storage water from the lakes is released into Big Creek, where it is diverted from the creek into the private ditch systems of the members of this association. Lands irrigated under the project are located in secs. 11, 12, 13, 24, and 25, T. 8 N., R. 21 W., secs. 6, 7, 8, 17, 18, 19, and 20, T. 8 N., R. 20 W.

Size and Capacity of Reservoir: There are two adjacent lakes connected by a short stream. The surface of the upper lake is only a foot or so higher than the lower lake. The dam backs water up in both lakes. By its conversion into a reservoir, Big Creek Lakes is the third largest storage reservoir in Ravalli County and has a capacity of 2,781 acre-feet of stored water. The drainage area above the lake is 5.1 square miles with the area of the two lakes covering a total of 241 acres.

Operation and Maintenance: Each water user in this association pays an O. and M. charge according to the number of shares owned. Total charges vary from year to year and for a normal year will average between Four and Five Hundred Dollars.

Present Users: Active subscribers in the association in 1957 totaled 27 water users.

Acreage Irrigated: In the year of 1957, the reservoir association delivered a supplemental water supply to 2,413 acres of land.

WATER RIGHT DATA

In the Big Creek Lakes Decree dated December 9, 1912, the Big Creek Lakes Reservoir Association was decreed 2,420 acre-feet of water, with the priority date of August 21, 1905. (Ref. Big Creek Lakes Decree, Case No. 1447, Judgment Book 2, Page 527, Ravalli County Courthouse). (See Maps in Part II, Pages 26 and 27).

BITTERROOT IRRIGATION DISTRICT

HISTORY

The origin of what is now the Bitterroot Irrigation District began in the year of 1905 as a private irrigation project known as the Bitterroot Valley Irrigation Company. At that time the possibilities of irrigating the east side land of the Bitterroot Valley were brought to Chicago and presented to W. I. Moody of that city. After an inspection of the property in June and July of 1905, Moody returned to the east with the idea that the irrigation project was feasible and that eastern capital would be interested in carrying out the work. He immediately associated himself with some other parties, including a writer, who took charge of laying out the canal system and reservoir. The next step in planning for the project was to secure cooperation from the citizens of the valley to gain control of the land, and to make the project more inviting to the bonding companies and banks of the west.

It was more than a year later, with the expenditures entirely from the pockets of Moody and his associates, before the great dam at Lake Como was started and more than seventeen miles of the canal completed. Due to the lack of funds to complete the work, Moody and his associates contacted the Assets Realization Company of Chicago who agreed to assume financial responsibility for completion of the project.

From the day construction began, until 1909, fifty-six miles of the canal were finished; fifteen thousand acres of land sold to purchasers; and water delivered to the acreage. The main canal extended as far as Stevensville on Burnt Fork Creek and left for the seasons of 1909 and 1910 the completion of a comparatively small part of the canal system. However, this small additional part of the canal reclaimed the greatest area of bench land in the Bitterroot Valley—that which lies between Stevensville and Missoula County, comprising about thirty thousand acres or an estimated one-third of the total available bench land. Within the heart of the thirty thousand acres on Three Mile Creek a new town named "Bitterroot" was built, and with the town came the development of twenty-five hundred acres of orchards known as "Sunnyside." At that time, in the year of 1910, the Bitterroot Valley Irrigation Company project was one of the most expensive (both total cost and in cost per acre for water) ever completed in this country. The original canal was eighty miles long, twenty-four feet wide at the bottom and carried a water flow averaging six feet in depth.

After operating for a period of about six years, the Bitterroot Irrigation Company finally became indebted to such an extent that on January 3, 1916, it was forced to file a petition of bankruptcy. Litigation in the courts to adjust the financial losses of the company lasted for several years, but in the meantime the country's need for farm products, especially during and after the war, made it imperative to keep the project in operation. From 1916 to 1920, covering the period of World War I, the project was operated by the landowners under the jurisdiction of the court. When the company's indebtedness was finally settled by the courts in 1920, the original investors' losses totaled about 4½ million dollars. The project works at the time of settlement were disposed of to private interests.

On December 9, 1920, the landowners under the project petitioned the court and received a decree creating the present Bitterroot Irrigation District.

In 1931, the District entered into a repayment contract with the Bureau of Reclamation, to provide funds for rehabilitating the irrigation system and to liquidate the private indebtedness of the District. None of the actual rehabilitation work was done by the Bureau. Federal funds were made available again in 1936 and 1948 for further work on the irrigation system. In 1950, the Bureau of Reclamation reconstructed the Rock Creek Diversion Dam and did some work in 1954 on the dam at Lake Como. At the present time the Bitterroot Irrigation District has made satisfactory progress in both operation and readjustment, and has prospects for a successful future.

PRESENT STATISTICS

Location: The main source of water for this irrigation project is from Rock Creek and Lake Como Reservoir on Rock Creek, which has a capacity 34,800 acre-feet. Additional sources of water are supplied to the District from Willow, Burnt Fork, Lost Horse, Skalkaho, Ambrose, Three Mile, Gray Horse, and Wheelbarrow Creeks. The District also claims some of the waters of South Birch Creek and Willoughby Creek. (See Water Right Data below).

The dam at Lake Como is located in the NW $\frac{1}{4}$ of secs. 32, T. 4 N., R. 21 W., with the lake area covering parts of secs. 31 and 32, T. 4 N., R. 21 W.; sec. 6, T. 3 N., R. 21 W.; and part of the unsurveyed area of T. 3 N., R. 22 W.

The point of diversion of the canal is from the left bank of Rock Creek in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 28, T. 4 N., R. 21 W. about $\frac{3}{4}$ of a mile below the dam. From its point of diversion the canal follows a northeasterly direction for 2.25 miles where it crosses the Bitterroot River by the means of a large siphon, approximately one mile in length which is located on the section line between the NE $\frac{1}{4}$ NE $\frac{1}{4}$ in sec. 22 and the NW $\frac{1}{4}$ NW $\frac{1}{4}$ in sec 23, T. 4 N., R. 21 W. From the siphon the canal continues in a northerly direction for 68.25 miles, where it terminates near the center of sec. 16, T. 10 N., R. 19 W. Another large structure in the canal system is a siphon three-fourths mile long, crossing Sleeping Child Creek in sec. 30, T. 5 N., R. 20 W.

A general description describing the location of the lands irrigated under the Bitterroot Irrigation District is as follows: T. 4 N., R. 21 W., T. 5 N., R. 20 W., T. 5 N., R. 21 W., T. 6 N., R. 20 W., T. 7 N., R. 20 W., T. 8 N., R. 19 W., T. 8 N., R. 20 W., T. 9 N., R. 19 W., T. 9 N., R. 20 W., T. 10 N., R. 19 W., and T. 10 N., R. 20 W.

Length and Capacity of Canal: The main canal has a total length of 71.5 miles with an initial carrying capacity of approximately 400 cfs.

Operation and Maintenance: Under this irrigation District the total annual water charges levied are \$4.90 per acre, which includes the cost of O. and M. The total acreage assessed under the District amounts to 16,665 acres. However, this assessed figure does not necessarily represent the actual number of acres irrigated due to an increase or decrease in the acreage irrigated by each water user in any particular one-year period.

Present Users: In 1957 there were 362 individual water purchasers under the Bitterroot Irrigation District.

Acreage Irrigated: In 1957 there were 17,386.20 acres irrigated under the Bitterroot Irrigation District and 45.50 acres potentially irrigable. The maximum irrigable acreages under the system totals 17,431.70 acres.

WATER RIGHT DATA

The following water rights formerly owned by the Bitterroot Valley Irrigation Company were transferred to the Bitterroot Irrigation District by the Ravalli Water Company on September 1, 1922. (Ref. Deed Book 64, Page 448, Clerk and Recorder's Office, Hamilton, Montana). Since the recording of this deed several of the water rights have been disposed of and others have been acquired. These legal transactions in disposing of and acquiring water rights are too numerous to mention here, but are available from the files of the State Engineer.

Listed below are the appropriated and decreed water rights now claimed by the District.

WATER RIGHTS

From Rock Creek: Appropriated by E. R. Kilbourne, dated 3-3-05 for 16,000 miner's inches of Lake Como (Ref. Book 4 of Placer Mill Site Water Records, Page 47); appropriated by Bitterroot Valley Irrigation Company, dated 6-17-07 for 40,000 miner's inches (Ref. Book 3 of Water Right Locations, Page 154).

From Skalkaho Creek: Decreed to Bitterroot Valley Irrigation Company, dated 11-26-08 for 20,000 miner's inches (Ref. Case No. 2149, Judgment Book 3, Page 268).

From Willow Creek: Decreed to John D. Forsyth, dated 5-1-87 for 25 miner's inches and 5-1-91 for 125 miner's inches; decreed to John H. Watts, dated 6-1-60 for 13 miner's inches of 104 miner's inches and 6-1-87 for 16 miner's inches; decreed to M. M. Humble, dated 6-1-60 for 6 miner's inches of 26 miner's inches, 6-9-88 for 20 miner's inches and 7-1-91 for 74 miner's inches; decreed to Louis Richards, dated 6-1-60 for 26 miner's inches and 7-1-91 for 74 miner's inches; decreed to J. L. Coughenour, dated 6-1-60 for 13 miner's inches, 6-9-88 for 10 miner's inches and 7-1-91 for 32 miner's inches; decreed to James Dunnigan, dated 6-9-88 for 10 miner's inches and 7-1-91 for 20 miner's inches; decreed to John L. Humble, Jr., dated 6-1-62 for 20 miner's inches of 30 miner's inches; and 7-1-91 for 80 miner's inches; decreed to Emmet Hawker, dated 11-10-84 for 60 miner's inches and 5-1-91 for 100 miner's inches; decreed to Thomas H. Ray, dated 7-1-92 for 120 miner's inches; decreed to J. P. Green, dated 6-1-91 for 40' miner's inches; decreed to J. S. Green, dated 6-1-91 for 35 miner's inches; decreed to Hettie Shelton, dated 6-1-77 for 30 miner's inches; decreed to Orville West, dated 7-25-92 for 45 miner's inches. (Ref. for above decreed rights out of Willow Creek, Case No. 931, Judgment Book 2, Page 162).

From Burnt Fork Creek and Tributaries: Decreed to William and Abe Buck, dated 5-10-78 for 80 miner's inches; decreed to Alexander Buck, dated 5-10-78 for 80 miner's inches; decreed to Abe Buck, dated 6-1-92 for 66 $\frac{2}{7}$ miner's inches; decreed to Lafayette M. Smith, dated 4-10-81 for 92.8 miner's inches and 7-1-83 for 139 $\frac{1}{3}$ miner's inches; decreed to J. B. Townsend, dated 3-20-83 for 20.5 miner's inches of 32.5 miner's inches, 6-1-84 for 12.8 miner's inches of 32 miner's inches, 5-20-83 for 14.4 miner's inches of 36 miner's inches, and 4-15-01 for 54 miner's inches of 135 miner's inches; decreed

to H. P. Dwyer, dated 3-20-82 for 32.5 miner's inches, 4-15-01 for 95 miner's inches and 6-1-87 for 42.5 miner's inches; decreed to Lula Smith, dated 4-5-82 for 19 $\frac{3}{7}$ miner's inches of 71 $\frac{3}{7}$ miner's inches; decreed to Frank Hunter, dated 4-5-82 for 41 $\frac{3}{7}$ miner's inches of 71 $\frac{3}{7}$ miner's inches; decreed to Albert and George May, dated 4-5-82 for 142 $\frac{6}{7}$ miner's inches; decreed to John Haley, dated 9-1-82 for 80 miner's inches, 5-15-90 for 50 miner's inches and 4-15-01 for 80 miner's inches; decreed to Emily A. Humphrey, dated 9-1-82 for 80 miner's inches, 5-10-86 for 35 miner's inches, 5-15-90 for 150 miner's inches and 4-15-01 for 80 miner's inches; decreed to James H. Burgoyne, dated 8-20-83 for 91 $\frac{2}{3}$ miner's inches and 5-1-87 for 55 $\frac{28}{30}$ miner's inches; decreed to Hettie E. Shelton, dated 8-20-83 for 91 $\frac{2}{3}$ miner's inches; decreed to Mary L. Wood, dated 8-20-83 for 91 $\frac{2}{3}$ miner's inches; decreed to W. M. Franks, dated 10-1-83 for 160 miner's inches; decreed to Lizzie Woods, dated 4-1-90 for 38 $\frac{4}{7}$ miner's inches of 135 miner's inches; decreed to S. L. Haley, dated 5-15-90 for 150 miner's inches and 4-20-85 for 50 miner's inches; decreed to M. L. Reed, dated 5-15-90 for 100 miner's inches; decreed to Vincent Burch, Sr., dated 5-15-90 for 100 miner's inches; decreed to Vincent Burch, Jr., dated 5-15-90 for 50 miner's inches; decreed to Harvey D. Fisher, dated 7-12-96 for 130 miner's inches; decreed to John Hayden, dated 7-10-99 for 95 miner's inches; decreed to E. V. Breechbill, dated 7-10-99 for 55 miner's inches; decreed to L. E. Manning, Jr., dated 7-10-99 for 78 miner's inches; decreed to R. B. Davis, dated 7-10-99 for 79 miner's inches; decreed to George W. Johnson No. 2, dated 7-10-99 for 80 miner's inches; decreed to William M. Hooper, dated 7-10-99 for 80 miner's inches; decreed to B. F. Julian, dated 4-15-01 for 55 miner's inches; decreed to Maggie R. Whitmore, dated 4-15-01 for 135 miner's inches and 6-1-87 for 42.5 miner's inches; decreed to John Treece, dated 5-1-01 for 150 miner's inches; decreed to Caleb Shonn, dated 5-1-01 for 150 miner's inches; decreed to Augustus C. Williams, dated 5-15-90 for 60 miner's inches of 120 miner's inches; decreed to B. D. Fausett, dated 6-24-96 for 111 miner's inches; decreed to James F. Davis, dated 6-24-96 for 111 miner's inches; and decreed to T. S. Haines, dated 7-12-96 for 100 miner's inches. (Ref. for above decreed rights out of Burnt Fork and Tributaries, Case No. 556, Judgment Book 1, Page 466).

From Three Mile Creek and Tributaries: Decreed to Albert and George May, dated 1866 for 81.75 miner's inches of 163.5 miner's inches (Three Mile Creek); dated 1866 for 27 miner's inches of 54 miner's inches (Gray Horse Creek) and dated 1866 for 48.75 miner's inches of 97.5 miner's inches (Wheelbarrow Creek). (Ref. Case No. 283, Judgment Book 2, Page 57).

From Ambrose Creek: Appropriated by Simeon P. Ives, dated 6-1-85 for 900 miner's inches (Ref. Book 1, Placer Mill Site and Water Record, Page 112); appropriated by B. F. Martz, dated 5-4-03 for 160 miner's inches (Ref. Book 3, Water Rights, Page 59); appropriated by Hiram Smith, dated 5-1-85 for 150 miner's inches (Ref. Book 1, Placer Mill Site Water Record, Page 113); appropriated by University Orchard and Development Company, dated 11-22-15 for 600 miner's inches (Ref. Book 3, Water Rights Locations, Page 272).

From South Birch and Willoughby Creek (also called Spring Creek) the District has some claim to water rights in both of these streams, but may have to prove their claims by court action to legally establish them.

Other water rights acquired by the District are from Lost Horse Creek and decreed to Bitterroot Valley Irrigation Company, dated 9-20-05 for 320 miner's inches and dated 7-9-07 for 28,000 miner's inches. (Ref. Case No. 1275, Judgment Book 2, Page 196).

NOTE: Location of the water rights listed above are to be found in Ravalli County Courthouse, Hamilton, Montana. (See Maps in Part II, Pages 16, 18, 19, 21, 23, 25, 26, 28, 29, 30, and 31).

BLODGETT CREEK IRRIGATION DISTRICT

HISTORY

The Blodgett Creek Irrigation District was created by a decree of the court on October 17, 1910, for the purpose of obtaining and supplying supplemental water to the landowners holding late priority rights in Blodgett Creek. With the construction of a dam at High Lake, water storage was secured, which provided the additional supply needed by the members of the District during the latter part of the irrigation season. A block of the water stored in High Lake was purchased by the Lomo Irrigation District, and its members were all included in the Blodgett Creek District.

PRESENT STATISTICS

Location: High Lake is located at the headwaters of a tributary to Blodgett Creek in the unsurveyed area of secs. 21, 28, and 29, T. 6 N., R. 22 W. From the lake, water is spilled into Blodgett Creek and picked up by private ditches for the irrigation of land in secs. 13, 14, 15, 22, 23, and 24, T. 6 N., R. 21 W.

Size and Capacity of Reservoir: High Lake has a storage capacity of 740 acre-feet and covers an area of 44 acres.

Operation and Maintenance: Under this system the water charge is 37c per acre of land irrigated. In 1956, the O. and M. costs totaled \$700.00 for the District. After July 15th of each year, the water users under this project have a period of seven (7) full days of available water for irrigation. The dates of water delivery are determined by the members of the District whenever their need for irrigation occurs. The District has no outstanding bonds or indebtedness.

Present Users: Under the Blodgett Creek Irrigation District there are a total of 47 subscribers, which includes the 34 members of the Lomo Irrigation District. Active shares total 1,908, with one share equal to 1 miner's inch for each acre of land irrigated.

Acreage Irrigated: The number of acres receiving a supplemental water supply from High Lake in 1957 were 229 acres with 10 acres potentially irrigable. This figure does not include the irrigated acreage of the members in Lomo District.

WATER RIGHT DATA

The water right that applies to this irrigation project was decreed to the Blodgett Creek Irrigation District as all of the water in High Lake. (Ref. Case No. 3916, Judgment Book 4, Page 361, Ravalli County Courthouse. (See Map in Part II, Page 22).

C. & C. DITCH USERS' ASSOCIATION (MUTUAL)

HISTORY

This ditch group, a nonprofit association, in which joint ownership and liability exists, is one of the oldest institutions in Hamilton. The ditch was first dug about 1880, and since that date has been subsequently enlarged. The first owners of the ditch were three pioneers of the area named Eastland, Christiansen, and Cohen, and it was from the latter two that the ditch got its name. The ditch runs

through the town of Hamilton and is sometimes used by children in the summertime for swimming purposes. The three original owners of the ditch each had homesteads on the site of what is now the town of Hamilton.

On May 12, 1941, a constitution and by-laws were drawn up and adopted for the association and the first officers elected were C. B. Sutliff, President; Nick Marick, Vice President; Paul Tschache, V. L. Shultz, and C. A. Bennett, Directors.

PRESENT STATISTICS

Location: The original C. & C. Ditch head gate diverted water from the right bank of the Bitterroot River in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of sec. 1, T. 5 N., R. 21 W. At the present time the old head gate from the Bitterroot River is washed out and has been changed to pick up the seepage, waste, and drainage waters in Skalkaho Creek near its confluence with the Bitterroot River. The main source of water supply for the C. & C. Ditch is from a drain ditch, draining the swampy area just south of Hamilton, where the seepage and waste waters from the Skalkaho Basin above, accumulate. Most of the lands irrigated from the ditch are small tracts of five acres or less, located within the townsite of Hamilton in secs. 24, 25, and 36, T. 6 N., R. 21 W.

Length and Capacity of Canal: From its head gate, the ditch follows in a northerly direction for 3 $\frac{1}{4}$ miles through the town of Hamilton, and ends just north of Town in the NE $\frac{1}{4}$ SE $\frac{1}{4}$ of sec. 24, T. 6 N., R. 21 W. It has a capacity large enough to carry the 760 miner's inches of water required by the users.

Operation and Maintenance: As set up in the constitution, the regular annual water assessment rates include O. and M. charges and were made applicable to each separate land unit as follows: \$1.40 for each lot (approximately 50x120 feet), 70c for each additional lot up to $\frac{3}{4}$ acre, \$2.80 for first acre, \$1.40 per acre for next four acres, and \$1.00 per acre for all acreage over five acres. However, in 1956 these rates were doubled and an additional \$1.00 charged as a special assessment.

Present Users: There are a total of 89 members belonging to the mutual ditch association.

Acreage Irrigated: In 1957, a total of 249 acres were irrigated under this ditch system.

WATER RIGHT DATA

Although not in use at the present time, the C. & C. Ditch Company was decreed from the Bitterroot River 320 miner's inches, dated 4-1-79 and 190 miner's inches, dated 4-1-95. Our survey was unable to find a recorded appropriation filing for the seepage, waste, and drainage water supply now used by the C. & C. Ditch. It will therefore have to be assumed, that the C. & C. Ditch has established a use right to the waste, seepage, and drainage waters accumulated in the swampy area from the Skalkaho Basin above and used by the ditch system. (Ref. for the decreed rights out of the Bitterroot River, Case No. 1287, Judgment Book 2, Page 481, Ravalli County Courthouse). (See Map in Part II, Page 22).

CANYON CREEK IRRIGATION DISTRICT

HISTORY

The Canyon Creek Irrigation District was formed on July 1909, to provide additional water storage in Canyon Creek Lakes, for the purpose of furnishing a supplemental supply to those users having rights in the stream at the lower end of Canyon Creek. Originally this District was set up into three subdivisions, known as Districts 1, 2, and 3, but it is now operated as one consolidated District. Water stored in the Canyon Creek Lakes is released into the stream and diverted by private ditch systems that are operated and maintained by the individual members of the District. The District lands are located near the town of Hamilton, on the west side of the Bitterroot River.

PRESENT STATISTICS

Location: Lands irrigated by the District are located in parts of secs. 21, 22, 23, 24, 26, 27, 34, and 35, T. 6 N., R. 21 W. The three lakes that could be used for storage purposes are Canyon Creek Lake, Lake No. 1, and Lake No. 2. At the present time Canyon Creek Lake is the only reservoir being used. The location of the lakes are in sec. 27 of the unsurveyed area of T. 6 N., R. 22 W.

Size and Capacity of Reservoir: The drainage area above Canyon Creek Lake is 1.1 square miles, with the lake covering an area of thirty-two acres and having a storage capacity of 475 acre-feet.

Operation and Maintenance: Water charges, including O. and M. of the dam are 15c for each acre of land irrigated. With the reservoir having only a storage capacity of 475 acre-feet, the water available for use is limited to one quarter of a miner's inch for each acre of land.

Present Users: There are 50 active members signed up under this District.

Acreage Irrigated: In 1957 there were 889.50 acres receiving a supplemental water supply and 144 acres potentially irrigable under the present project ditch system.

WATER RIGHT DATA

There is no recorded water right filing on record for use of the stored water used by the District from Canyon Creek Lake. On June 28, 1909, the U. S. Forest Service issued a permit to the Canyon Creek Irrigation District for the construction of a dam at Canyon Creek Lake. The Forest Service Permit and the fact that the water has been stored and used by the irrigation District, are the only claims the District has for a water right. (See Map in Part II, Page 22).

CARLTON CREEK IRRIGATION COMPANY

The Carlton Creek Irrigation Company is located for the most part in Missoula County, with only one water user in Ravalli County. The company first incorporated on November 30, 1918, for a period of twenty years and after expiration of its corporate existence, the company reincorporated on June 15, 1939, for another term of twenty years. "The purposes for which the company was formed are to divert, appropriate, buy, sell, lease, and use the waters of Carlton Creek, Carlton Creek Lakes and their tributaries; to acquire and own, water rights and easements in said waters of said Carlton Creek, Carlton Creek Lakes and their tributaries; and to acquire, buy, appropriate, and own, lease, sell any and

all ditch right-of-ways, easements, dams, flumes, land, reservoirs, reservoir sites, etc., necessary or convenient to be owned, appropriated or used in and about the appropriation, buying, selling, leasing or using said waters."

It is the intention of the State Engineer's Office, Water Resources Survey to work Missoula County, where this project is located, within the next two years. A more complete and detailed report on the Carlton Creek Irrigation Company will be made at that time. In the year 1957, there were a total of 20 acres irrigated by the one water user under this irrigation system in Ravalli County. (Ref. Carlton Creek Decree, Case No. 1835, Missoula County Courthouse). (See Map in Part II, Page 31).

CHARLOS IRRIGATION DISTRICT

HISTORY

This irrigation District consists of a storage reservoir at Twin Lakes on Lost Horse Creek and a ditch system that diverts water from the creek for use on the project lands, which are located seven miles south of Hamilton and west of U. S. Highway 93. The District was formed for the purpose of furnishing water for irrigation to its members and to administer, operate, and maintain the project works. Permission for construction of the reservoir was granted by Forest Service Permit on July 10, 1924.

PRESENT STATISTICS

Location: Under this District there are three main ditch diversions from Lost Horse Creek for the delivery of water to the project lands. The largest of these ditches is the Clausen-Kramis Ditch, which has its point of diversion on the left bank of the creek in the SE $\frac{1}{4}$ NW $\frac{1}{4}$ of sec. 17, T. 4 N., R. 21 W. Another ditch known as the Club House Ditch, diverts water from the left bank of the creek in the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 9, T. 4 N., R. 21 W. A third ditch, named the Low Ditch, diverts water from the left bank of the creek near the center of the north line of the SE $\frac{1}{4}$ of sec. 9, T. 4 N., R. 21 W. Lands irrigated from the ditch system are in parts of secs. 2, 3, 4, 9, 10, and 11, T. 4 N., R. 21 W. Water is spilled into Lost Horse Creek from the Twin Lakes Reservoir, which is located in parts of secs. 29, 30, and 32, in the unsurveyed area of T. 5 N., R. 23 W.

Length and Capacity of Canals: The Clausen-Kramis Ditch follows a generally northeasterly direction from its point of diversion for a distance of 3.5 miles and has a capacity of 20 cfs. The Club House Ditch follows an easterly direction from its head gate for a distance of 2.5 miles with a capacity of 5 cfs. The Low Ditch courses in a generally easterly direction for 1.5 miles, its capacity being about 5 cfs.

Size and Capacity of Reservoir: Twin Lakes Reservoir has a total lake area of 82 acres and the combined lakes have a capacity of 620 acre-feet. The drainage above, flowing into Twin Lakes is comparatively small with a total area of only 1.8 square miles.

Operation and Maintenance: For the District, O. and M. charges are included in the total water cost which is \$1.75 for each acre of land irrigated.

Present Users: There were 40 water users signed up under the District during the irrigation season of 1957.

Acres Irrigated: In 1957, the District had a maximum of 969 acres under irrigation.

WATER RIGHT DATA

Water rights used by the Charlos Irrigation District are as follows: From Lost Horse Creek, decreed to Grant Van Sant for 320 miner's inches, dated May 1, 1884; 65 miner's inches, dated June 1, 1892, 140 miner's inches, dated April 1, 1893 and 320 miner's inches, dated February 20, 1904; decreed to Oscar Judd for 65 miner's inches, dated June 1, 1892. (Ref. Lost Horse Creek Decree Case No. 1275, Judgment Book 2, Page 196, Ravalli County Courthouse). The District has the following appropriative water rights: Appropriated by Charlos Heights Orchards Company from Twin Lakes for 800 miner's inches, dated August 16, 1910; appropriated by Charlos Heights Orchard Company from Lower Twin Lake for 800 miner's inches, dated August 16, 1910, and appropriated by Charlos Heights Orchard Company from Upper Twin Lake for 800 miner's inches, dated August 16, 1910. (Ref. Book 4 of Placer Millsite Water Record, Pages 166, 163, and 164, Ravalli County Courthouse, Hamilton, Montana). The irrigation District also has four water rights appropriated from Camas Lakes Nos. 2, 3, 4, and 5, dated August 17, 1910 for 400 miner's inches each (not in use). (Ref. Book 4 of Placer Millsite Water Records, Pages 150, 152, 154, and 157, Ravalli County Courthouse, Hamilton, Montana). (See Map in Part II, Page 16).

THE CORVALLIS CANAL AND WATER COMPANY

HISTORY

This ditch was first incorporated under the name of the "Surprise Ditch Company," on June 31, 1884, for a period of twenty years. Under the Surprise Ditch the first water users were John F. Allen, William D. Lear, Maaman Johnson, Ferdinand Wehr, and B. F. Sanders.

Before the twenty year period of existence expired for the Surprise Ditch Company, reincorporation articles were filed on February 27, 1897, and the name changed to "The Corvallis Canal and Water Company," with the term of existence twenty years.

The last incorporation of The Corvallis Canal and Water Company took place on February 17, 1917, with the period of existence forty years. However, the corporation articles were not recorded until January 22, 1922, and therefore will not expire until January 22, 1962. An amendment to the articles of incorporation for The Corvallis Canal and Water Company occurred on March 4, 1933, with the amount of capital stock increased from \$4,250.00 divided into 85 shares at \$50.00 per share to a capital stock of \$17,000.00 and 85 shares of a par value of \$200.00 each.

PRESENT STATISTICS

Location: The canal diverts water from the right bank of the Bitterroot River, west of Hamilton in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of sec. 25, T. 6 N., R. 21 W. and follows a generally northeasterly direction, for the irrigation of lands in secs. 13, and 24, T. 6 N., R. 21 W.; secs. 4, 5, 6, 7, 8, and 18, T. 6 N., R. 20 W. and secs. 9, 10, 15, 16, 20, 21, 22, 28, 29, 31, 32, and 33, T. 7 N., R. 20 W.

Length and Capacity of Canal: The main canal of The Corvallis Canal and Water Company is approximately 9.5 miles long and has a carrying capacity in excess of 125 cfs. An upper lateral of the canal system starts from a point on the main canal in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of sec. 33, T. 7 N., R. 20 W. and continues in a northeasterly direction for a distance of 4.5 miles where it ends in the NE $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 10, T. 7 N., R. 20 W.

Operation and Maintenance: In 1956 each share of stock in the canal company was assessed \$29.41 with the cost of operating and maintaining the canal totaling \$2,500.00 for the year.

Present Users: With 85 active stock shares in the company, each share is equal to 58.8 miner's inches of water. The 85 shares of stock are divided among 133 water users in the canal system.

Acreage Irrigated: For the year 1957 there were 3,827.5 acres irrigated and 21 acres potentially irrigable under the canal.

WATER RIGHT DATA

The Corvallis Canal and Water Company has a decreed water right from the Bitterroot River of 5,000 miner's inches with a priority date of January 1, 1871. (Ref. Case No. 1287, Judgment Book 2, Page 481, Ravalli County Courthouse, Hamilton, Montana). (See Maps in Part II, Pages 21, 22, and 23).

ETNA DITCH COMPANY (MUTUAL)

HISTORY

The Etna Ditch was constructed and water appropriated for the system in March, 1871, by Henry Flanigan, Anderson Buker, Reese Powell, C. H. Flanigan, J. W. McCarty, Cortez Goff, William Strange, John Sellers, and Charles Fallas. Twenty-four years later, on May 25, 1895, the successors in interest to the ditch, recorded a water right filing in the amount of 9,000 miner's inches from the Bitterroot River, establishing the date of the original appropriation as March, 1871.

In 1914, an agreement between the Etna, Webfoot, and Union Ditches called for a joint improvement program in connection with their ditch systems. Most important of these improvements was the construction of a concrete diversion dam across the main channel of the Bitterroot River. Joseph Iten, the contractor, completed the dam on March 19, 1915, and it was constructed to divert water from the main channel into a side channel of the river where a dependable supply of water would be available at all times to the three ditch systems.

PRESENT STATISTICS

Location: The diversion dam is located on the main channel of the Bitterroot River in the SW $\frac{1}{4}$ -SE $\frac{1}{4}$ of sec. 8, T. 7 N., R. 20 W. where it diverts water into a side channel of the river. 1.75 miles below or northeast of the dam, the Etna Ditch diverts water from the right bank of the channel in the NE $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 4, T. 7 N., R. 20 W. Lands irrigated by the ditch are in secs. 22, 23, 26, 27, 28, 33, and 34, T. 8 N., R. 20 W.

Length and Capacity of Canal: Following a northerly direction for 4.25 miles, the ditch ends in the SE $\frac{1}{4}$ NE $\frac{1}{4}$ of sec. 22, T. 8 N., R. 20 W. The ditch has a carrying capacity of 1,545 miner's inches.

Operation and Maintenance: In 1956 O. and M. expenditures totaled \$650.00, which has been the average for the past several years. There are only eight (8) active stock shares in the ditch, however, three other shares are issued to a private ditch user for maintenance of the diversion dam and the use of the side channel as a carrier. Each shareholder pays O. and M. according to the number of shares he owns in the ditch.

Present Users: The 8 shares of stock in the Etna Ditch are divided among 7 water users, with one share of stock being equal to 193.125 miner's inches.

Acreage Irrigated: In 1957, there were 1,059.7 acres irrigated from the Etna Ditch with no potential irrigation.

WATER RIGHT DATA

All the water rights carried in the Etna Ditch are from the Bitterroot River and owned by the individuals in the ditch. These water rights are as follows: Decreed to William Strange, dated 3-1-71 for 255 miner's inches; decreed to Clarence Goff, dated 3-1-71 for 360 miner's inches; decreed to W. B. Spooner, dated 3-1-71 for 160 miner's inches; decreed to C. P. Mendall, Administrator, dated 3-1-71 for 240 miner's inches; decreed to Oliver McCarty et al, dated 3-1-71 for 160 miner's inches; decreed to Victor Land and Livestock Company, dated 3-1-71 for 300 miner's inches; decreed to Nye Black, dated 3-1-71 for 70 miner's inches. (Ref. Case No. 1287, Judgment Book 2, Page 481, Ravalli Courthouse, Hamilton, Montana). (See Map in Part II, Page 26).

FRED BURR CREEK WATER USERS' ASSOCIATION

HISTORY

The Fred Burr Creek Water Users' Association, a State Water Conservation Board Project, was organized and incorporated on May 28, 1946. A permit was obtained from the U. S. Forest Service on March 22, 1946, for permission to construct the project. "The objects and purposes for which the corporation was formed are to appropriate, purchase, market, sell, pump, divert, develop, furnish, distribute, lease and dispose of the surplus water of Fred Burr Creek, which is impounded by the means of a dam and a storage reservoir."

Original subscribers for stock in the association were B. R. Roberts, E. C. Payne, William Firth, Fred Dullenty, and Joe Ess. Capital stock of the corporation amounted to \$2,000.00, which was divided into 2,000 shares of a par value of \$1.00 each.

PRESENT STATISTICS

Location: The Fred Burr Creek Reservoir is located in parts of secs. 14 and 15 in the unsurveyed area of T. 7 N., R. 22 W. Stored water is released down Fred Burr Creek where it is diverted and used by private ditches in the vicinity of the town of Victor. The water is used as a supplemental supply for the irrigation of lands in secs. 10, 11, 14, 15, 21, 22, 23, and 24, T. 7 N., R. 21 W.

Size and Capacity of Reservoir: The reservoir has a capacity of 515 acre-feet and covers a flooded area of 32 acres.

Operation and Maintenance: Under this project O. and M. assessments are 45c per acre-foot of water sold, in addition to repayment charges set at \$2.50 per acre-foot.

Present Users: During the year of 1956 there were 8 (eight) water users purchasing a total of 515 acre-feet of stored water.

Acreage Irrigated: In 1957 there were 835 acres supplemented with water from this storage project and 25 acres potentially irrigable.

WATER RIGHT DATA

Water rights pertaining to this project are as follows: The State Water Conservation Board purchased the first decreed water right from Fred Burr Creek, which was decreed to M. S. Adams, for 60 miner's inches, having a priority date of June 1, 1870. (Ref. Case No. 724, Judgment Book 1, Page 436, Ravalli County Courthouse, Hamilton, Montana). In addition to the decreed right, the Water Board filed and recorded an appropriation for all the unappropriated water of Fred Burr Creek, dated May 25, 1946. (Ref. Permanent File No. 723, Ravalli County Courthouse, Hamilton, Montana). (See Map in Part II, Page 24).

LOMO IRRIGATION DISTRICT

HISTORY

The Lomo Irrigation District was created on November 10, 1922, to eliminate many of the problems in connection with the operation, maintenance, and distribution of water for the 4th right users of Blodgett Creek. Under this district the 4th right water users have a total of 25 decreed water rights from Blodgett Creek, with a priority date of June 1, 1891, that they own and carry in their private ditch systems. On July 15, of each year when the water in Blodgett Creek becomes low, the 4th right water users are cut off. To compensate for this water shortage, the irrigation District has obtained a supplemental water supply which they purchased from the Blodgett Irrigation District. This supplemental supply is from a storage reservoir at High Lake and is delivered to the water users by being released into Blodgett Creek where it is picked up by the private ditch systems within the District.

PRESENT STATISTICS

Location: The Lomo District comprises a small area located about two miles NW of the town of Hamilton, and includes land in parts of secs. 13, 14, 15, 22, and 23, T. 6 N., R. 21 W.

Size and Capacity of Reservoir: The High Lake Reservoir which supplies the supplemental water to the District has a storage capacity of 740 acre-feet and covers an area of approximately 44 acres.

Operation and Maintenance: Water charges for O. and M. are about 30c per acre and for the past several years the total cost of O. and M. has averaged between \$250.00 and \$300.00 yearly. At the present time the District is free from any bonded indebtedness.

Present Users: In the year of 1956, there were 34 individual water users in the District. The supplemental water from High Lake, furnished members of the District, is limited to one miner's inch for each acre of land irrigated and will last for seven days of continuous irrigation.

Acreage Irrigated: During the year of our survey in 1957, there were 674 acres irrigated with no potential irrigable acres under the District.

WATER RIGHT DATA

The water rights from Blodgett Creek owned by individual members of the Lomo District are as follows: Decreed to E. A. Johnson and J. H. Dunbar, dated 6-1-91 for 100 miner's inches; decreed to P. W. Jones, dated 6-1-91 for 10 miner's inches; decreed to Andrew Johnson, dated 6-1-91 for 15 miner's inches; decreed to A. L. Johnston, dated 6-1-91 for 20 miner's inches; decreed to William Dow-

kes, dated 6-1-91 for 20 miner's inches; decreed to Wesley Barcus, dated 6-1-91 for 20 miner's inches; decreed to T. L. Adair, dated 6-1-91 for 15 miner's inches; decreed to O. M. Gerer, dated 6-1-91 for 150 miner's inches; decreed to John Long, dated 6-1-91 for 20 miner's inches; decreed to Michael and Frank Lombardi, dated 6-1-91 for 30 miner's inches; decreed to N. G. and Margaret Blodgett, dated 6-1-91 for 25 miner's inches; decreed to William Cox, dated 6-1-91 for 10 miner's inches; decreed to Z. R. and Annie Moore, dated 6-1-91 for 80 miner's inches; decreed to Herbert Vial, dated 6-1-91 for 10 miner's inches; decreed to Robert Speer, dated 6-1-91 for 4 miner's inches; decreed to G. E. Sullenger, dated 6-1-91 for 90 miner's inches; decreed to John Ransom, dated 6-1-91 for 10 miner's inches; decreed to Frank White, dated 6-1-91 for 15 miner's inches; decreed to H. R. Ward, dated 6-1-91 for 80 miner's inches; decreed to H. S. Page, dated 6-1-91 for 90 miner's inches; decreed to G. Wessling, dated 6-1-91 for 20 miner's inches; decreed to Mrs. Daniel Swearinga, dated 6-1-91 for 40 miner's inches; decreed to E. J. Semmons, dated 6-1-91 for 5 miner's inches; decreed to Ed. L. Willey, dated 6-1-91 for 30 miner's inches; decreed to Ravalli County, dated 6-1-91 for 100 miner's inches. (Ref. Case No. 957, Judgment Book 2, Page 37, Ravalli County Courthouse).

The District also has two appropriation filings on seepage, waste, and drainage water in the amounts of 60 and 120 miner's inches respectively, dated as of May 6, 1953. (Ref. Book 13, Misc. Records, Pages 560 and 561).

The supplemental water used by members of the District was decreed to the Blodgett Creek Irrigation District as being all of the water in High Lake which is located in secs. 21, 28, and 29, T. 6 N., R. 22 W. (Ref. Case No. 3916, Judgment Book 4, Page 361).

NOTE: All of the above rights are filed and recorded in the Ravalli County Courthouse. (See Map in Part II, Page 22).

MILL CREEK IRRIGATION DISTRICT

HISTORY

This project consists of water storage in Mill Creek Lake, that provides a supplemental supply to the members of the District having late priority rights in Mill Creek. From the lake, water is spilled into the stream, where it is diverted into private ditch systems for use by members of the District. The District, located about three miles northwest of the town of Hamilton, was created on June 15, 1910. The boundaries were defined and three commissioners named by District Judge Myers in accordance to the petition of the interested landowners. It embraces an area of about 2,300 acres and the commissioners appointed by the court were O. L. Kinney, J. E. Lockwood, and Dr. H. D. Browning.

PRESENT STATISTICS

Location: Lands irrigated under the District are in secs. 1, 2, 3, 4, 9, and 10, T. 6 N., R. 21 W. and secs. 26, 27, 34, 35, and 36, T. 7 N., R. 21 W. Mill Creek Lake is located in secs. 1 and 12 in the unsurveyed area of T. 6 N., R. 23 W.

Size and Capacity of Reservoir: Mill Creek Lake has a small drainage area above the reservoir of only .8 of one square mile, with the lake covering an area of 25 acres. The storage capacity of the lake is 670 acre-feet.

Operation and Maintenance: At the present time the District has no bond indebtedness and its budget is used to take care of any District expenses. For the last two years the District has been without the services of a water commissioner but when one was employed, $\frac{1}{3}$ of his salary was paid by the District and $\frac{2}{3}$ by the owners of the decreed water rights in Mill Creek. Water charges including O. and M. on the dam are set at 30c per acre. Operation and maintenance of the private ditches are the responsibility of the owners.

Present Users: Water users in the district totaled 17 during the summer of 1957.

Acreage Irrigated: In 1957, the district had a total of 1,665 acres irrigated, with 13 acres potentially irrigable under present ditch facilities.

WATER RIGHT DATA

On August 12, 1908, the Mill Creek Irrigation District was issued a permit by the U. S. Forest Service for the construction of a dam at Mill Creek Lake, this permit was amended on October 18, 1944. A recorded water filing was never made for the storage of water in Mill Creek Lake. Since the stored water in the lake has been used for several years, the only claim the District may have for a water right is by use. (See Maps in Part II, Pages 22 and 24).

RAVALLI WATER USERS' ASSOCIATION

(Daly Ditch Project)

HISTORY

This project consists of several irrigation ditches commonly known as the Republican, Hedge, Ward, Skalkaho Hi-Line, Gird Creek Ditches, waste ditches, distribution laterals, and three small reservoirs located on tributaries of Skalkaho Creek.

The Republican Ditch was originally constructed by the Republican Ditch Company prior to the year 1885 and in 1901 the canal right-of-way and water right were conveyed to the Ravalli Land and Irrigation Company and by it deeded to the State Water Conservation Board on October 1, 1942.

The Hedge Ditch was constructed in most part by the late Marcus Daly, with all the rights-of-way and water rights conveyed by Margaret P. Daly, for herself as executrix of the will of Marcus Daly, to the Ravalli Land and Irrigation Company on December 20, 1901. From this company, the ditch was conveyed to the State Water Conservation Board on October 1, 1942.

The Ward and Skalkaho Hi-Line Ditches were also constructed by Marcus Daly, and later conveyed to the Ravalli Land and Irrigation Company the same as the Hedge Ditch, and then to the State Water Conservation Board as of October 1, 1942. Water rights decreed from Skalkaho Creek are available for use in either of these ditches and may be used in the irrigation of lands by other ditches diverting from Skalkaho Creek. The Water Board also has the right to exchange waters now owned by it in the Bitterroot River, for waters appropriated and used from Skalkaho Creek, and the right to divert said waters received in exchange through the ditches of the Water Board, conducting said waters on to higher lands not irrigable from the Bitterroot River, mainly through the Ward and Skalkaho Hi-Line Ditches.

The Gird Creek Hi-Line Ditch and the Lower Gird Creek Ditch (Studbarn) are the same as the other ditches acquired by the State Water Conservation Board from the Ravalli Land and Irrigation Company and includes the right to all of the waters of Gird Creek, an unadjudicated stream. This right not only includes all of the waters naturally in Gird Creek, but also any waters brought into the Gird Creek drainage from any other source of supply. (Mainly from the Hi-Line Canal from Skalkaho Creek).

There are three small reservoirs on the Skalkaho drainage used in connection with this project having a total capacity of 440 acre-feet of water, which were constructed by the Ravalli Land and Irrigation Company on Forest Service land in the years of 1925 and 1926, under permit from the U. S. Forest Service. These waters are usually released from storage in late August to augment the supply of water in Skalkaho Creek.

The project is presently operated and maintained by the State Water Conservation Board; however, the Ravalli Water Users' Association was incorporated on April 5, 1952, and its members are the water users from the project. Its duly elected Board of Trustees consult with the Water Board in all matters of reconstruction, operation, maintenance, and water distribution in order that the water users may have a voice in these matters.

It is contemplated that in due time the water users will perfect an organization and take over the operation and maintenance of the project to relieve the Water Board of this obligation.

PRESENT STATISTICS

Location: The Republican Ditch diverts from the right bank of the Bitterroot River in the SE $\frac{1}{4}$ NE $\frac{1}{4}$ of sec. 25, T. 5 N., R. 21 W.; and irrigates land in secs. 12 and 13, T. 5 N., R. 21 W.; secs. 7 and 18, T. 5 N., R. 20 W.; secs. 8, 17, 18, 19, 30, and 31, T. 6 N., R. 20 W.; secs. 13 and 24, T. 6 N., R. 21 W. and sec. 33, T. 7 N., R. 20 W.

The point of diversion of the Hedge Ditch is from the right bank of the Bitterroot River in the SE $\frac{1}{4}$ NW $\frac{1}{4}$ of sec. 11, T. 4 N., R. 21 W. Lands irrigated under this ditch are located in sec. 13, T. 5 N., R. 21 W.; secs. 5, 7, 8, and 18, T. 5 N., R. 20 W.; secs. 3, 4, 8, 9, 10, 16, 17, 19, 20, 21, 22, 29, 30, 31, and 32, T. 6 N., R. 20 W.; and secs. 22, 26, 27, 28, 33, 34, and 35, T. 7 N., R. 20 W.

The Ward Ditch diverts water from the right bank of Skalkaho Creek in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of sec. 30, T. 5 N., R. 19 W.; and irrigates land in secs. 3, 4, 5, 9, and 16 T. 5 N., R. 20 W.; and secs. 21, 22, 27, 28, 32, 33, and 34, T. 6 N., R. 20 W.

The point of diversion of the Skalkaho Hi-Line Ditch is from the right bank of Skalkaho Creek in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of sec. 30, T. 5 N., R. 19 W. The ditch follows a northwesterly direction for the irrigation of land in secs. 3, 4, 5, 9, 10, and 15, T. 5 N., R. 20 W.; and secs. 32 and 33, T. 6 N., R. 20 W.

The Gird Creek Hi-Line Ditch has its point of diversion from the right bank of Gird Creek in the NW $\frac{1}{4}$ NW $\frac{1}{4}$ of sec. 11, T. 5 N., R. 20 W. and follows a northerly direction where it irrigates land in secs. 22, 23, 26, 27, 34, and 35, T. 6 N., R. 20 W.

Another ditch called the Lower Gird Creek Ditch (Studbarn) diverts from the right bank of Gird Creek in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of sec. 3, T. 5 N., R. 20 W. and extends in a northerly direction for the irrigation of land in sec. 3, T. 5 N., R. 20 W. and sec. 34, T. 6 N., R. 20 W.

Length and Capacity of Canals: REPUBLICAN DITCH is approximately 12.75 miles in length and has an initial carrying capacity of 150 cfs.

THE HEDGE DITCH has a carrying capacity in excess of 140 cfs and a total length of 23.25 miles.

THE WARD DITCH extends for the distance of 10 miles and has a capacity of 150 cfs.

THE SKALKAHO HI-LINE DITCH is about 6 miles in length with a capacity of 175 cfs.

THE GIRD CREEK HI-LINE DITCH is 4.5 miles long and has a capacity sufficient to carry all of the natural flow in Gird Creek.

THE LOWER GIRD CREEK DITCH (Studbarn) has a capacity large enough for the irrigation of approximately 300 acres of land, with a total length of 1.5 miles.

Operation and Maintenance: O. and M. charges are included in the present annual charge of \$3.00 per acre which entitles the delivery of three acre-feet of water per acre, with a charge of \$1.00 per acre foot for water used in excess of the allowable amount; also, there are various minimum charges for small tracts in the area near Hamilton.

Present Users: During the year of 1957, there was a total of 310 active water users under contract for delivery of water under the Ravalli Water Users' Association ditch project.

Acreage Irrigated: In 1957, the amount of irrigated and irrigable land under the various ditch systems of the Ravalli Water Users' Association were as follows: Republican Ditch—1,922.55 acres irrigated with 67.50 acres potentially irrigable; Hedge Ditch—5,025.50 acres irrigated with 20 acres potentially irrigable; Ward Ditch—1,865 acres irrigated with no acreage potentially irrigable; Skalkaho Hi-Line Ditch—1,344 acres irrigated with no acreage potentially irrigable; Gird Creek Hi-Line Ditch—918 acres irrigated with 148 potentially irrigable; Lower Gird Creek Ditch (Studbarn)—286 acres irrigated with no acreage potentially irrigable; and by Private Ditch systems—647 acres irrigated with 14 acres potentially irrigable. The total for all ditches in the Ravalli Water Users' Association is 12,008.05 acres irrigated with 249.50 acres potentially irrigable and a maximum irrigable acreage of 12,257.55.

WATER RIGHT DATA

Water rights used by the Ravalli Water Users' Association were conveyed by deed to the State Water Conservation Board by the Ravalli Land and Irrigation Company on October 1, 1942 and are as follows: FROM THE BITTERROOT RIVER: Decreed to the Ravalli Land and Irrigation Company, 6,000 miner's inches, dated June 1, 1885. (Now used in the Republican Ditch); decreed to the Ravalli Land and Irrigation Company, 5,600 miner's inches, dated April 15, 1898. (Used in the Hedge Ditch).

Water rights from Skalkaho Creek now used by the Ravalli Water Users' Association were conveyed to the State Water Conservation Board by the Ravalli Land and Irrigation Company on October 1, 1942 and are recorded as follows: Deeded to the Ravalli Land and Irrigation Company: 110 miner's inches, dated 6-15-65; 160 miner's inches, dated 5-1-67; 80 miner's inches, dated 5-1-68; 320 miner's inches, dated 6-1-68; 160 miner's inches, dated 5-1-69; 300 miner's inches, dated 5-1-70; 160 miner's inches, dated 5-1-70; 40 miner's inches, dated 6-1-70; 100 miner's inches, dated 5-1-72; 160 miner's inches, dated 5-1-72; 40 miner's inches, dated 5-1-75; 40 miner's inches, dated 6-1-75; 110 miner's inches, dated 6-1-84; 190 miner's inches, dated 5-1-80; 145 miner's inches, dated 5-1-82; 320 miner's inches, dated 5-1-83; 1,600 miner's inches dated 5-1-83; 200 miner's inches, dated 5-1-83; 640 miner's inches, dated 9-30-83; 160 miner's inches dated 10-16-85; 266 miner's inches, dated 4-28-85; 1,360 miner's inches, dated 6-26-88; 1,680 miner's inches, dated 5-1-91; and 1,200 miner's inches, dated 5-1-99). The total of the above rights from Skalkaho Creek is 238.52 cfs.

There were six water rights conveyed to the State Water Conservation Board by the Ravalli Land and Irrigation Company which include all of the waters of Gird Creek, an unadjudicated stream, and all of the waters naturally in Gird Creek or brought into the Gird Creek drainage from any other source of supply. The rights from Gird Creek are as follows: appropriated by James M. Burnley for 600 miner's inches, dated 6-9-69 (Ref. Book 1 of Placer Millsite Water Record, Page 13); appropriated by James Headley for 150 miner's inches, dated 6-26-94 (Ref. Book 1 of Placer Millsite Water Record, Page 383); appropriated by Rory McLeod for 50 miner's inches, dated 6-20-82 (Ref. Book 2 of Water Right Locations, Page 166); appropriated by Rory McLeod for 100 miner's inches, dated 5-1-72 (Ref. Book 2 of Water Right Locations, Page 167); appropriated by Jacob Sherrill for 600 miner's inches, dated 5-1-70 (Ref. Book 1 of Placer Millsite Water Record, Page 180); and appropriated by Gustavus A. Wolf for 200 miner's inches, dated 1868 (Ref. Book 1 of Placer Millsite Water Record, Page 154).

The waters appropriated for storage in the three reservoirs are located on Forest Service land and have never been filed for record. The water rights for these reservoirs are therefore based upon use and the U. S. Forest Service Permits. Reservoir No. 1 situated on the south fork of Skalkaho Creek has an area of 15.94 acres with a storage capacity of 180 acre-feet. A permit for this reservoir was granted from the U. S. Forest Service Department in the year of 1912 and work completed on the reservoir in 1926. Reservoir No. 2 situated on the south fork of Skalkaho Creek has an area of 5.92 acres with a storage capacity of 60 acre-feet. A permit was granted from the U. S. Forest Service Department in the year of 1912 and the reservoir completed in 1926. Reservoir No. 3 situated on the north fork of Skalkaho Creek has an area of 9.35 acres with a storage capacity of 200 acre-feet. The permit was granted by the U. S. Forest Service in the year of 1912 and construction was completed in 1925.

Exchange water rights from Skalkaho Creek that are used by the State Water Conservation Board on this project are too numerous to mention here, but are on file in the State Engineer's office. However, these exchange water rights from Skalkaho Creek total 3,160.986 miner's inches and are used on higher lands mainly through the Ward and Skalkaho Hi-Line Ditches. The owners of these exchange rights have land which is located below the Republican and Hedge Ditches and are supplied an equivalent amount of water from these ditches. (Ref. Water rights deeded to the State Water Conservation Board by the Ravalli Land and Irrigation Company are located in Deed Book 86, Page 386; Bitterroot River Decree Case No. 1287 located in Book 2, Page 481. Skalkaho Creek Decree Case No. 2149, located in Judgment Book 3, Page 268; all in Ravalli County Courthouse, Hamilton, Montana). (See Maps in Part II, Pages 18, 19, 21, 22 and 23).

ROCK CREEK WATER COMPANY

HISTORY

The Rock Creek Water Company was first incorporated as the Rock Creek Ditch Company on July 27, 1901. After operating as a ditch company for 20 years, the company reincorporated on June 10, 1922, for a term of existence of 40 years under the name of the Rock Creek Water Company. The capital stock of the corporation was Thirty-two hundred dollars (\$3,200.00) divided into 320 shares of the par value of \$10.00 each. The first water users and subscribers of stock in the ditch company were: J. F. Waddell, Thomas Padden, G. D. Gorns, Fred A. Gorns, W. R. Gilford, Alice Beam, and W. J. Tiedt. The purpose for which this corporation was formed are to construct a ditch system; to acquire by purchase or to appropriate water and water rights conveyed; to deliver and distribute by the same means the water to the stockholders of the company, owning lands where such water is now being used.

PRESENT STATISTICS

Location: The Rock Creek Ditch diverts water from the right bank of the South Fork of Rock Creek (also called Little Rock Creek) in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of sec. 1, T. 3 N., R. 22 W., about $\frac{1}{4}$ mile from where the creek empties into Como Lake. Irrigated lands from the ditch system are located in secs. 3 and 4, T. 3 N., R. 21 W.; secs. 27, 28, 33, and 34, T. 4 N., R. 21 W.

Length and Capacity of Canal: The main ditch extends in a northeasterly direction from its point of diversion for a distance of 2 miles, where it splits into two ditches in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ of sec. 6, T. 3 N., R. 21 W. One ditch continues northeasterly for 1 mile where it spills into Shannon Lake in the NE $\frac{1}{4}$ NW $\frac{1}{4}$ of sec. 5, T. 3 N., R. 21 W. and then continues from Shannon Lake in the northeasterly direction for two miles, ending in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 27, T. 4 N., R. 21 W. The other ditch continues in an easterly direction for 2 $\frac{1}{2}$ miles and ends in the SW $\frac{1}{4}$ NW $\frac{1}{4}$ of sec. 4, T. 3 N., R. 21 W. This ditch spills into Waddell Creek where lateral ditches divert to irrigated lands below. The capacity of the main ditch at the present time will carry 800 miner's inches of water and will need cleaning to carry the 1,280 miner's inches allotted to the system.

Operation and Maintenance: Water charges for the upkeep of this project average \$320.00 per year or \$1.00 for each share of stock owned.

Present Users: All of the 320 stock shares have been subscribed to in this ditch company and are owned by 10 water users. Each share of stock owned in the company represents 4 miner's inches of water.

Acreage Irrigated: In 1957 there were a total of 732 acres irrigated by the Rock Creek Water Company.

WATER RIGHT DATA

The water right that applies to the Rock Creek Water Company is from Rock Creek, an unadjudicated stream, and was appropriated by Elmer Bliss, W. R. Gilford, F. A. and G. D. Gorns, R. B. Nicholson, Thomas Padden, Pat Shannon, and J. F. Waddell on January 2, 1893, for 1,280 miner's inches of water. (Ref. Book 2 of Water Right Locations, Page 324, Ravalli County Courthouse, Hamilton, Montana). (See Maps in Part II, Pages 14 and 16).

SUNSET IRRIGATION DISTRICT

HISTORY

The petition for the formation of the Sunset Irrigation District was granted by R. Lee McCulloch, Judge of the District Court, on November 12, 1917, and contained the following: That the establishment and organization of this District shall be known as "Sunset Irrigation District." "That the water rights in Burnt Fork Creek and Burnt Fork Lake belonging to the petitioners herein, and to others similarly situated who wish to come in, are to be unified and systematized; and the water so obtained to be consolidated and conducted on to the lands within said proposed District by the means of one main canal, of sufficient size for the purposes intended; and by the acquirement or construction of such other works and property as further examination may determine to be advantageous and desirable."

Construction Features: The contract for construction of a new irrigation ditch for the District was awarded to the Lord Construction Company of Hamilton on March 1, 1918. Work was completed on the ditch system June 1, 1918, in time for use during the irrigation season of that year. The District was bonded for \$20,000.00, of which \$18,000.00 was used for construction of the ditch and the balance of \$2,000.00 used for engineering and other incidental expenses. Most important features in the canal system are approximately 15 miles of lateral ditches and ½ mile of metal pipe siphon, costing \$40,000.00.

PRESENT STATISTICS

Location: Two main ditch systems are used in this irrigation project. One ditch is named the Sunset Highline Ditch and it diverts water from the left bank of Burnt Fork Creek in the NW¼NE¼ of sec. 14, T. 8 N., R. 19 W. The other ditch is called the Baker Ditch and diverts water from the left bank of Burnt Fork Creek in the NW¼SW¼ of sec. 11, T. 8 N., R. 19 W. Lands irrigated from these ditches are in secs. 4, 5, 6, 7, 8, 9, 10, 11, 16, and 17, T. 8 N., R. 19 W.; secs 1 and 12, T. 8 N., R. 20 W.

Length and Capacity of Canals: The Sunset Highline Ditch from its point of diversion follows a northwesterly direction for about ¼ of a mile where it enters a pipe siphon ½ mile long, then continues in a westerly direction for 5 miles ending in the NW¼NW¼ of sec. 13, T. 8 N., R. 20 W. Initial capacity of this canal is 2,000 miner's inches. The Baker Ditch diverts water from the left bank of Burnt Fork Creek and follows a northwesterly direction for about 5 miles where various laterals flume the Bitterroot Irrigation District Canal in sec. 1, T. 8 N., R. 20 W. This ditch has a capacity sufficient for the irrigation of all lands under the system.

Operation and Maintenance: Annual water charges for the District total \$2.50 per acre, which includes O. and M. Of this amount, \$1.25 is placed in the general fund and \$1.25 used in the sinking fund for unforeseen emergencies that might arise in maintaining the project.

Present Users: A total of 34 water users were signed up in the District during the year of 1957.

Acreage Irrigated: In 1957 the amount of acreage irrigated under this District totaled 2,634 acres.

WATER RIGHT DATA

The Sunset Irrigation District has the following water rights from Burnt Fork Creek: Decreed to S. D. Cowell for 320 miner's inches, dated June 1, 1863; decreed to Hannah E. Whaley for 80 miner's

inches, dated June 1, 1863; decreed to D. J. Whaley for 160 miner's inches, dated April 15, 1865; decreed to Miller Humble for 120 miner's inches, dated April 1, 1866; decreed to Napoleon Dumontier for 160 miner's inches, dated June 10, 1866; decreed to Peter P. Whaley for 160 miner's inches, dated October 4, 1877; decreed to Robert C. Smith for 175 $\frac{7}{9}$ miner's inches, dated April 10, 1881; decreed to Bennett L. and Milton J. Baker for 69 $\frac{2}{3}$ miner's inches, dated April 10, 1881; decreed to Burch L. Logan for 139 $\frac{1}{3}$ miner's inches, dated April 10, 1881; decreed to B. F. Julian for 32 $\frac{1}{2}$ miner's inches dated March 20, 1882; decreed to J. B. Townsend for 12 miner's inches of 32 $\frac{1}{2}$ miner's inches, dated March 20, 1882; decreed to Maggie R. Whitmore for 32 $\frac{1}{2}$ miner's inches, dated March 20, 1882; decreed to W. E. Cannon for 116 miner's inches, dated April 1, 1882; decreed to L. W. Faucett for 139 $\frac{1}{3}$ miner's inches, dated May 21, 1883; decreed to Fred Metcalf for 27 $\frac{29}{30}$ miner's inches, dated May 1, 1887 and 33 $\frac{3}{4}$ miner's inches, dated April 1, 1890; decreed to R. S. McIntyre for 27 $\frac{29}{30}$ miner's inches, dated May 1, 1887; decreed to James Carruthers for 67 $\frac{1}{2}$ miner's inches, dated April 1, 1890; decreed to N. P. Stafferson for 33 $\frac{3}{4}$ miner's inches, dated April 1, 1890 and 50 miner's inches, dated June 1, 1891; decreed to Lizzie Woods for 36 $\frac{3}{7}$ miner's inches of 135 miner's inches, dated April 1, 1890; decreed to John J. Smith for 150 miner's inches, dated May 1, 1901; decreed to Thomas Johnson for 60 miner's inches of 120 miner's inches, dated May 25, 1881 and 85 miner's inches, dated June 15, 1886; decreed to James L. Carruthers for 68 miner's inches, dated August 1, 1888; decreed to Augustus C. Williams for 120 miner's inches, dated May 15, 1890; and decreed to Barnett D. Fausett for 111 miner's inches, dated May 20, 1897. (Ref. Burnt Fork Decree, Case No. 556, Judgment Book 1, Page 466, Ravalli County Courthouse).

The District has the following appropriated water rights from Burnt Fork Lake: Appropriated by E. H. Metcalf and C. B. Calkins for 600 miner's inches appropriated on October 9, 1907; appropriated by J. B. Humphrey, B. F. Julian and George May for all of the water of Burnt Fork Lake, dated August 19, 1901; appropriated by J. B. Humphrey, B. F. Julian and George May for all water of Burnt Fork Lake, dated October 7, 1901; appropriated by E. H. Metcalf for 2,000 miner's inches, dated September 2, 1891. (Ref. for the above water rights are Book 4, Placer Millsite Water Record, Page 99; Book 1, Placer Millsite Water Record, Pages 607, 623, and 616, Ravalli County Courthouse, Hamilton, Montana).

Permission for construction of the dam on Burnt Fork Lake was obtained by a U. S. Forest Service Permit on May 16, 1929. Burnt Fork Lake, located in sec. 3 of the unsurveyed area of T. 6 N., R. 18 W., covers an area of approximately thirty acres and has a maximum capacity of 550 acre-feet. (See Maps in Part II, Pages 25 and 26).

SUPPLY DITCH ASSOCIATION **(Including Wood-Parkhurst Ditch)**

HISTORY

Historical background of the Supply Ditch Association began with the formation of the Supply Ditch Company on February 3, 1897. Capital stock in the incorporated company totaled \$10,000.00, which was divided into 10,000 shares of a par value of \$1.00 per share. The term of existence was for twenty years and included as original shareholders John S. Robertson, Vincent Burch, Amos Buck, H. P. Dwyer, S. D. Cowell, Russell Gwinn, and Joshua T. Woods. The early history of this ditch system began several years before its incorporation as a private ditch of George Wood and John Parkhurst, and as extensions to the original Wood-Parkhurst Ditch were made the ditch developed into a separate system known as the Supply Ditch Company.

On November 21, 1898, the Supply Ditch Company increased the capital stock of the corporation from \$10,000.00 to \$20,000.00 at \$1.00 per share. When its first term of corporate existence expired on February 3, 1917, the ditch company extended its articles of incorporation for a period of forty years and changed the name of the company to Supply Ditch Association. Recently, on September 1, 1956, the Supply Ditch Association filed a declaration of intent for the right of continual succession.

The Supply Ditch Association is actually two separate ditch systems insofar as operation and maintenance is concerned, with the first $6\frac{3}{4}$ miles of the ditch known as the Wood-Parkhurst and the balance of the system called the Supply Ditch. Both of these systems use the same head gate and ditch from the Bitterroot River.

PRESENT STATISTICS

Location: The point of diversion of the canal is from the right bank of a main channel of the Bitterroot River in the $SE\frac{1}{4}NW\frac{1}{4}$ of sec. 20, T. 7 N., R. 20 W.

Lands irrigated under the project are described as follows: From the Wood-Parkhurst Ditch in secs. 3, 4, 9, 10, 16, and 17, T. 7 N., R. 20 W.; from the Supply Ditch in secs. 3, 10, 14, 15, 22, 23, 26, 27, and 34, T. 8 N., R. 20 W.; secs. 1, 2, 11, 12, 13, 14, 15, 23, 26, 27, 34, and 35, T. 9 N., R. 20 W. Water is also supplied to Houtchens-Templeton Ditch for irrigation of land in sec. 1, T. 9 N., R. 20 W., sec. 31, T. 10 N., R. 19 W., and sec. 36, T. 10 N., R. 20 W.

Length and Capacity of Canals: The Wood-Parkhurst Ditch extends from the point of diversion in a northeasterly direction for a distance of $6\frac{3}{4}$ miles and has an initial capacity of 175 cfs. From the end of the Wood-Parkhurst Ditch, the Supply Ditch follows a northerly direction for a distance of about 11 miles, with a carrying capacity of 5,000 miner's inches or 125 cfs. At a point in the $SE\frac{1}{4}SE\frac{1}{4}$ of sec. 1, T. 9 N., R. 20 W., the Supply Ditch spills into Three Mile Creek, where Houtchens-Templeton Ditch picks up the water and follows a northeasterly direction for a distance of $2\frac{1}{4}$ miles. The total length of the canal system is 20 miles.

Operation and Maintenance: The O. and M. charges for the Supply Ditch Association in 1956 was \$8,300.00, with $\frac{2}{7}$ of the yearly cost assessed to the Wood-Parkhurst Ditch and $\frac{5}{7}$ to the Supply Ditch. For each individual water user of the ditch system. O. and M. charges are based on the number of shares owned. One share of stock in the Wood-Parkhurst Ditch is equivalent to 196 miner's inches of water. In the Supply Ditch, 5 shares of stock are equal to one miner's inch of water.

Present Users: In the Supply Ditch there are 88 active stockholders and a total of 15 are in the Wood-Parkhurst Ditch.

Acreage Irrigated: In 1957 there were 3,034.30 acres irrigated under the Supply Ditch with no acreage potentially irrigable. The Wood-Parkhurst Ditch had 1,327 acres irrigated with no acres of potential irrigable land. The total for the Supply Ditch Association, including the Wood-Parkhurst Ditch is 4,361.30 acres irrigated.

WATER RIGHT DATA

The Supply Ditch Association and the Wood-Parkhurst Ditch have the following water rights appurtenant to each irrigation system.

Supply Ditch Water Rights: From Bitterroot River: Decreed to the Supply Ditch Company, dated 5-1-98 for 5,000 miner's inches. (Ref. Case No. 1287, Judgment Book 2, Page 481).

From Burnt Fork Creek: Decreed to the Supply Ditch Company, dated 3-22-12 for 1,000 miner's inches. (Ref. Case No. 556, Judgment Book 1, Page 466).

Wood-Parkhurst Water Rights: From Bitterroot River: Decreed to George G. Wood dated 4-1-72 for 80 miner's inches; decreed to J. F. and Mary Wood, dated 4-1-72 for 200 miner's inches; decreed to E. R. Dean, dated 4-1-72 for 160 miner's inches; decreed to John B. Spooner, dated 4-1-72 for 160 miner's inches; decreed to Stella Spooner, dated 4-1-72 for 320 miner's inches; decreed to John Treece, dated 4-1-97 for 120 miner's inches; decreed to John A. Jones, dated 4-1-97 for 40 miner's inches; decreed to Flora M. Morris, dated 4-1-72 for 240 miner's inches; decreed to The Victor Land and Livestock Company, dated 4-1-72 for 200 miner's inches; decreed to Della Alford, dated 4-1-72 for 160 miner's inches; decreed to A. L. Spooner, dated 4-1-72 for 120 miner's inches; decreed to Frank P. Harlan (Adm. of Roswell Parkhurst Est.), dated 4-1-72 for 160 miner's inches. (Ref. for the above water rights, Case No. 1287, Judgment Book 2, Page 481, located in the Ravalli County Courthouse, Hamilton, Montana). (See Maps in Part II, Pages 23, 26, 29, 30 and 31).

SWEENEY CREEK WATER USERS' ASSOCIATION

HISTORY

This association was formed for the purposes of building dams and reservoirs, and to obtain permits from the Forest Service of the United States for reservoiring waters on Sweeney Creek, which will be used in the irrigation of lands occupied and cultivated by members of the association. The project consists of the storage of water in Holloway Lake, which is released into Sweeney Creek and diverted for use by individual ditch systems. The original shareholders in this association were: W. J. Jennings, Ole Nousianen, John H. Hendrickson, John Hendrickson, Matt Matson, Otto Johnson, C. W. Murphy, Peter Boltz, A. Crump, H. H. Townsend, Joe Ostman, Leo Jarecki, and Edward Peter.

On August 20, 1926, incorporation articles were filed for the association which included a capital stock of \$3,000.00, divided into 100 shares of the par value of \$30.00 per share. The term of existence of this corporation shall be for forty years from and after the date of its incorporation. The stock of this association is assessable.

PRESENT STATISTICS

Location: Holloway Lake, the storage reservoir, is located in sec. 8 of the unsurveyed area of T. 10 N., R. 21 W. at the headwaters of the North Fork of Sweeney Creek. The storage water is diverted from Sweeney Creek into individual ditches for the irrigation of lands in secs. 21, 22, 23, 28, and 29, T. 10 N., R. 20 W.

Size and Capacity of Reservoir: The lake area of the reservoir covers 25 acres and has a storage capacity of 280 acre-feet.

Operation and Maintenance: The total cost for O. and M. has averaged about \$70.00 per year for this project.

Present Users: There are 24 active shares in the association, which are divided among 11 shareholders. One share is equivalent to 40 miner's inches of water.

Acreage Irrigated: In the year of 1957, 652 acres were supplied with supplemental water under this irrigation system.

WATER RIGHT DATA

The water right for this project is based on use, and a permit issued by the U. S. Forest Service, dated April 17, 1924. No recorded water right filing was found for the appropriation and storage of water. (See Map in Part II, Page 31).

TIN CUP WATER COMPANY

HISTORY

The Tin Cup Water Company was incorporated on November 7, 1952, for a period of existence of forty years. Original subscribers of stock in the company and its water users were: W. H. Brandbo, Catherine Johnson, Howard H. Buhler, Weldon E. Buhler, George (Jerry) Else, Boyd H. Gibbons, Jr., and Clifford Buhler. The purposes for which this company was formed are to maintain, construct, and enlarge the Tin Cup Low Line Ditch; and distribute to the shareholders of this company through the ditch and to persons who by contract have the right to receive water through the ditch, the waters of Tin Cup Creek and Tin Cup Dam Reservoir Site in accordance with the rights of the parties thereto. Also to provide for the cost of such construction, enlargement and maintenance, and distribution. A permit from the U. S. Forest Service was granted the company on December 9, 1952 for construction of the dam and storage reservoir at Tin Cup Lake.

Capital stock of this corporation was issued without a par value and consists of the following four classes: Class A stock 800 shares issued to stockholders who own water rights with a priority of October 20, 1889 in Tin Cup Creek and ditch rights for the same through the Tin Cup Low Line Ditch.

Class B stock consists of 360 shares issued to stockholders who own water rights in Tin Cup Creek with a priority of June 1, 1914, and ditch rights for the same through the Tin Cup Low Line Ditch. (Class A and B stock shall be issued on the basis of one share of stock for each miner's inch of decreed water delivered through Tin Cup Low Line Ditch).

Class C stock consists of 250 shares issued to stockholders who own water rights in the first 1,500 acre-feet of storage in Tin Cup Lake.

Class D stock consists of 60 $\frac{1}{3}$ shares issued to stockholders who own water rights in the excess storage of Tin Cup Lake, after the rights of the first 1,500 acre-feet of storage have been supplied. (Class C and D stock shall be issued on the basis of one share of stock for each six acre-feet of storage rights owned by the respective stockholders).

PRESENT STATISTICS

Location: McIntosh-Morello Low Line Ditch, (also known as the Tin Cup Low Line Ditch) diverts water from the left bank of Tin Cup Creek in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 16, T. 3 N., R. 21 W. The Tin Cup Lake Storage Reservoir is located in parts of secs. 1 and 12 in the unsurveyed area of

T. 2 N., R. 23 W. Kerlee Lake, although not used at the present time for storage purposes, belongs to the Tin Cup Water Company and is located in parts of secs. 20 and 29 in the unsurveyed area of T. 3 N., R. 22 W. Lands irrigated by this ditch and reservoir project are located in secs. 3, 4, 9, 10, 15, and 16, T. 3 N., R. 21 W.

Length and Capacity of Canal: The McIntosh-Morello Low Line Ditch (Tin Cup Low Line Ditch) extends from its point of diversion in a southeasterly direction for a distance of about one mile, where it turns in a northerly direction for another 5½ miles, its total length being 6½ miles. Judging from the number of water rights allotted to this ditch system, its capacity would be in excess of 50 cfs.

Size and Capacity of Reservoirs: The Tin Cup Lake Reservoir has a maximum capacity of about 2,600 acre-feet and the Kerlee Lake Reservoir, which was not used in 1957, has a capacity in excess of 400 acre-feet.

Operation and Maintenance: O. and M. charges under the project are limited to repairs and maintenance of the dam and ditch system and the assessments vary from year to year. Whenever O. and M. charges are made, they are divided in proportion to the number of stock shares each stockholder owns in the company. One share of stock is equal to one miner's inch of water.

Present Users: There were a total of eight water users holding stock shares in this company during the year of 1957.

Acreage Irrigated: In 1957 there were 1,029 acres irrigated under the Tin Cup Water Company Project with eight acres potentially irrigable under present ditch facilities.

WATER RIGHT DATA

Water rights applicable to the Tin Cup Water Company are as follows: From Tin Cup Creek, decreed to McIntosh-Morello Orchards, Inc. for 700 miner's inches, dated 10-20-89; 360 miner's inches, dated 6-1-14; and 200 miner's inches, dated 6-1-08. Decreed to R. G. Ostegren for 100 miner's inches, dated 10-20-89. (Ref. Tin Cup Creek Decree Case No. 4964, Judgment Book 6, Pages 153 to 252, Ravalli County Courthouse). Also the decreed right of all the water stored in Tin Cup Lake. See stipulation in the Tin Cup Decree, Case No. 4964 listed above. The company's water in Kerlee Lake, which amounts to storage of 400 acre-feet, was decreed to the Tin Cup Water Company in Case No. 4964. (See Map in Part II, Page 14).

UNION DITCH COMPANY (MUTUAL)

HISTORY

The Union Ditch was first constructed and water appropriated for the system in the year of 1889. Among the early water users in the ditch were Amos Buck, Henry Buck, J. W. Lancaster, F. W. Howard, O. A. Thatcher, Albert May, James Sanders, A. P. Williamson, John Colcord, S. F. Warner, Thomas Combs, James Haigh, and Gib Strange.

On January 13, 1903, the water users in the Union Ditch petitioned the court for a decree establishing their respective water rights in the ditch. (Ref. Case No. 561, Judgment Book 1, Page 372).

In 1914 the Union, Etna, and Webfoot Ditches signed an agreement for the joint installation of a dam and other improvements in connection with their ditch systems. Construction of the dam was completed by Joseph Iten, the contractor, on March 19, 1915. The concrete dam, 12 feet wide, was built across the main channel of the Bitterroot River and so constructed that as the water became low during the irrigation season planks could be placed on top, thus diverting the entire flow of water to the head gates of the three ditches. With the completion of the dam the Union, Etna, and Webfoot Ditches had the most dependable water supply of any ditches diverting from the river.

PRESENT STATISTICS

Location: The dam is located on the main channel of the Bitterroot River in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of sec. 8, T. 7 N., R. 20 W., where it diverts water into a side channel of the river. One and one-fourth miles below the dam, the Union Ditch head gate diverts from the right bank of the channel in the SW $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 4, T. 7 N., R. 20 W. Lands irrigated by the ditch are in secs. 3, 10, 15, and 22, T. 8 N., R. 20 W.; secs. 27 and 34, T. 9 N., R. 20 W.

Length and Capacity of Canal: From its point of diversion, the Union Ditch follows a northerly direction for a distance of 10.5 miles, and ends at Stevensville in the NE $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 27, T. 9 N., R. 20 W. Capacity of the ditch is sufficient to carry the 1,860 miner's inches decreed to the system.

Operation and Maintenance: O. and M. charges for the last three years have averaged \$1,600.00 per year, the payment of which is divided among the shareholders in the ditch. A total of eleven shares were issued for this mutual ditch system, with one share equivalent to 169 miner's inches of water.

Present Users: The eleven shares of the ditch are now divided among 52 water users.

Acreage Irrigated: In 1957, the area irrigated by the Union Ditch totaled 1,147 acres with no potential irrigable acreage.

WATER RIGHT DATA

In the Bitterroot River Decree, the Union Ditch was given 1,860 miner's inches of water with a priority date of October 4, 1889. (Ref. Case No. 1287, Judgment Book 2, Page 481, Ravalli County Courthouse, Hamilton, Montana). (See Maps in Part II, Pages 26, and 29).

WARD IRRIGATION DISTRICT

HISTORY

The first irrigation under what is now the Ward Irrigation District began in the year of 1903 with the construction of a ditch by George Ward. Ward's plan called for a much larger irrigation project, but he had to curtail the length of the ditch system when he was unable to purchase additional right-of-way. The present Ward Irrigation District Canal has about the same location as the original ditch built by George Ward.

The Ward Irrigation District was created by a court decree on July 2, 1938. This project consists of an irrigation canal having its source of water from the Bitterroot River and Lost Horse Creek.

PRESENT STATISTICS

Location: The Ward Ditch diverts from the left bank of the Bitterroot River in the NE¼NW¼ of sec. 14, T. 4 N., R. 21 W. and provides water for the irrigation of lands in secs. 2 and 3, T. 4 N., R. 21 W.; secs. 23, 25, 26, 35, and 36, T. 5 N., R. 21 W.

Length and Capacity of Canal: From its point of diversion out of the Bitterroot River, the Ward Ditch extends in a northerly direction for ½ mile where it picks up water from Lost Horse Creek; it then continues for 1.75 miles where it spills into Hayes Creek. Hayes Creek is then used as a carrier for this water to its confluence with Camas Creek. Using Camas Creek as a carrier, another ditch of the Ward System diverts from the creek and continues in a northerly direction for 1.75 miles, where it ends in the NE¼SE¼ of sec. 23, T. 5 N., R. 21 W. The total length of the Ward Ditch System, including the length of the two creeks used as carriers is 5.25 miles. Capacity of the ditch system is sufficient for the irrigation of approximately 700 acres of land. There are several other ditches in the District that divert water directly from Camas Creek.

Operation and Maintenance: The District's cost for O. and M. are included in the total water charge of \$1.50 per acre per year.

Present Users: During the year 1957, there were 29 water users signed up under the District.

Acreage Irrigated: In 1957 the District had a total of 566.90 acres under irrigation with no potential irrigable acreage under present ditch facilities.

WATER RIGHT DATA

The water rights that are used by the Ward Irrigation District were decreed to George W. Ward and are as follows: From Lost Horse Creek, 1,000 miner's inches with a priority date September 12, 1905. (Ref. Lost Horse Creek Decree, Case No. 1275, Judgment Book 2, Page 196, Ravalli County Courthouse); from Bitterroot River: 700 miner's inches, dated June 30, 1903; 300 miner's inches, dated March 8, 1909; 5,300 miner's inches, dated June 30, 1903; and 1,700 miner's inches, dated March 8, 1909. At the present time there are only 2,000 miner's inches used by the District of the decreed water from the Bitterroot River. (Ref. Bitterroot River Decree, Case No. 1287, Judgment Book 2, Page 481, Ravalli County Courthouse). (See Maps in Part II, Pages 16 and 19).

WEBFOOT DITCH COMPANY (MUTUAL)

HISTORY

The origin and early history of the Webfoot Ditch began in the year of 1871, when a man named Lancaster appropriated water for his private ditch diverting from the Bitterroot River. During the years that followed, the private ditch was extended to include other water users, and it became known as the Webfoot Ditch. As of today, many of the older residents of the area refer to the Webfoot as the Lancaster Ditch.

In 1914, the Webfoot, Union and Etna Ditches signed a joint agreement in the best interests of their ditch systems for the construction of a diversion dam on the main channel of the Bitterroot River. The dam was constructed in 1915, and diverted water into a side channel of the river, mak-

ing a dependable supply of water available at all times for the three ditches. With the completion of a new diversion dam, the Webfoot, Etna and Union Ditches were better situated as far as their water supply was concerned than any other ditches taking water from the river.

PRESENT STATISTICS

Location: The diversion dam is located in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of sec. 8, T. 7 N., R. 20 W., where the water is diverted into a side channel to the head gate of the Webfoot Ditch, a distance of 4 $\frac{1}{2}$ miles below the dam. Diverting from the right bank of the channel in the NE $\frac{1}{4}$ SE $\frac{1}{4}$ of sec. 28, T. 8 N., R. 20 W., the ditch supplies water for the irrigation of land in secs. 10, 15, 16, 21, 22, 27, and 28, T. 8 N., R. 20 W.

Length and Capacity of Canal: From the point of diversion and following a northerly direction for 3.75 miles, the ditch terminates in the NW $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 10, T. 8 N., R. 20 W. Another ditch in the Webfoot system diverts water from the left bank of the river channel in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ of sec. 28, T. 8 N., R. 20 W. and extends in a northerly direction for $\frac{3}{4}$ of a mile. The initial capacity of the main Webfoot Ditch is sufficient to carry 1,232 miner's inches.

Operation and Maintenance: Charges for operation and maintenance will average about \$150.00 per year. Based on the number of shares owned in the ditch, the charge of \$150.00 is divided in proportion among the shareholders.

Present Users: There are 10 water users in the Webfoot Ditch having a combined total of 10 $\frac{1}{2}$ stock shares, each share represents 117.33 miner's inches.

Acreage Irrigated: A total of 613.50 acres were irrigated during 1957 with no potential land that could be irrigated by present facilities.

WATER RIGHT DATA

In the Bitterroot River decree, the Webfoot Ditch was given 1,232 miner's inches of water with a priority date of February 20, 1871. (Ref. Case No. 1287, Judgment Book 2, Page 481, Ravalli County Courthouse, Hamilton, Montana). (See Map in Part II, Page 26).

WEST FORK OF THE BITTERROOT STORAGE PROJECT

(West Fork Water Users' Association — Inactive)

This project consists of a dam and storage reservoir on the West Fork of the Bitterroot River which was built by the State Water Conservation Board. On January 5, 1938, permission was granted for construction of the reservoir by permit from the U. S. Forest Service. The dam is located near the center of sec. 26, T. 1 S., R. 22 W., about forty miles south of Darby. Work was started on this project April 1, 1938, and completed on August 14, 1940. The storage capacity of the reservoir is 31,706 acre-feet and covers a flooded area of 655 acres. This storage project was built to furnish a supplemental water supply for any of the lower ditch systems diverting out of the Bitterroot River for the irrigation of land as far north as Missoula. Prior to the construction of the project, the State Water Conservation Board required the formation of an association of prospective water users to secure the funds necessary to finance the construction works.

The West Fork Water Users' Association was formed on September 15, 1937. From the beginning of its organization, the West Fork Water Users' Association has been inactive due to the fact that the sale of water from the reservoir to members of the association failed to materialize. Since this time, the Water Board has operated the project and sold a limited amount of water to individual water users on a yearly basis. At a recent meeting of the Water Board it was agreed to promote the sale of water from this project by contacting all of the water users under the ditches diverting from the Bitterroot River to determine their needs for an additional water supply. At the present time there are 5,000 acre-feet of water contracted for from the project.

WOODSIDE IRRIGATION COMPANY

HISTORY

The first water users of the Woodside Ditch were Win Burrell and Louis Wagner. Formation of the Woodside Irrigation Company was completed on September 19, 1905, when W. S. Burrell, A. E. Burrell, and W. H. Pierce filed articles of incorporation for the company. Capital stock of the company amounted to \$6,000.00, which was divided into 2,000 shares of par value of \$3.00 each. After the first forty year period of existence expired, a certificate of extension for another forty year period was filed on September 26, 1945.

On May 11, 1929, the Woodside Ditch was decreed by the court to establish the claims of ten persons and their respective water rights in the ditch. A total of 923.5 miner's inches of water was decreed by the court to be carried in the ditch. (Ref. Case No. 4627, Judgment Book 5, Page 370, Ravalli County Courthouse).

PRESENT STATISTICS

Location: The ditch diverts water from the left bank of the Bitterroot River in the SW $\frac{1}{4}$ NE $\frac{1}{4}$ of sec. 13, T. 6 N., R. 21 W.

Land irrigated by the ditch is located in sec. 6, T. 6 N., R. 20 W. and secs. 1 and 12, T. 6 N., R. 21 W.; secs. 19, 30, and 31, T. 7 N., R. 20 W.; and secs. 25, 36, T. 7 N., R. 21 W.

Length and Capacity of Canal: The main ditch follows a northerly direction for a distance of approximately five miles, ending in the vicinity of Mill Creek in the SE $\frac{1}{4}$ SW $\frac{1}{4}$ of sec. 19, T. 7 N., R. 20 W. Capacity of the ditch is about 50 cfs.

Operation and Maintenance: An assessment charge of 50c for each share of stock owned by the water users was made during the irrigation season of 1956. Each share of stock is equal to one miner's inch of water.

Present Users: As of the date of our survey in 1957, there were 26 individual water users in the Woodside Ditch Company.

Acreage Irrigated: There were 680 acres irrigated under the Woodside Ditch in 1957, with no potential irrigation under present facilities.

WATER RIGHT DATA

The Woodside Ditch Company has a decreed water right of 2,000 miner's inches from the Bitterroot River, with the priority date of October 1, 1905. (Ref. Case No. 1287, Judgment Book 2, Page

481, Ravalli County Courthouse, Hamilton, Montana). The ditch company also claims a use right for high water in Blodgett Creek. (See Maps in Part II, Pages 21, 22, 23 and 24).

WATER MARKETING CONTRACT

This is an agreement between a Water Users' Association and the State Water Conservation Board on any project built or operated by the Board: whereby the Board agrees to sell to the Association all of the available water of the project, and the Association agrees to distribute same to water purchasers and provide method of payment of sums due, levying of assessment for operation and maintenance cost, time of notification of such levy to be given water purchasers, time of default and remedies in the event of default.

WATER PURCHASE CONTRACT

This is a three party contract entered into between the individual water purchaser, the Association and the State Water Conservation Board on any project built or operated by the Board: whereby the individual agrees to purchase a definite amount of water and to pay therefore a definite sum of money on or before a definite day, until a definite future date; in addition to such definite annual sum, the individual agrees to pay such additional sum or sums as may be required annually as his proportionate share of the cost of operation and maintenance of the Association. This contract is not valid until the water purchaser executes a Subscription and Pledge Agreement.

WATER RIGHT DATA — RAVALLI COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

			APPROPRIATIONS		DECREED RIGHTS			
			(Filings of Record)					
STREAMS	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.	
COLUMBIA RIVER BASIN								
*CLARK FORK OF COLUMBIA (Missoula) RIVER								
Bitterroot River	51	361,940	9,048.500	1287 ¹	94	56,688.00	1,417.200	
				7367	2	1,600.00	40.000	
				3684 ¹	1	400.00	10.000	
				4289 ¹	8	1,165.00	29.125	
				4508 ¹	1	120.00	3.000	
				561 ¹	13	1,859.04	46.476	
				4627 ¹	10	923.50	23.088	
West Fork Bitterroot River	9	13,444	336.100	1287	(See Bitterroot River)			
Johnson Creek	3	1,620	40.500					
Chicken Creek	2	2,500	62.500					
Hughes Creek	12	72,870	1,821.750					
Emmett Creek	3	250	6.250					
South Fork Emmett Creek	1	150	3.750					
Lake Creek	6	4,400	110.000					
Burrell Creek	5	2,458	61.450					
Sawmill (Mill Creek)	2	6,500	162.500					
Taylor Creek	3	310	7.750					
Alder Gulch	1	40	1,000					
Unnamed Creek	1	40	1,000					
Chrandal Creek	8	5,500	137.500					
South Fk. Chrandal Creek	1	500	12.500					
East Fk. Chrandal Creek	1	600	15.000					
Unnamed Creek	1	200	5.000					
McGarr Creek	1	200	5.000					
Metcalf Creek	1	6,000	150.000					
Tin Creek	1	300	7.500					
Wan Creek	1	80	2.000					
West Creek	1	160	4.000					
Coal Creek	4	2,260	56.500					
Overwhich Creek	13	47,500	1,187.500					
Straight Creek	1	720	18.000					
Boyd Creek	1	600	15.000					
Stein Creek	1	200	5.000					
Johnson Creek	1	1,000	25.000					
West Fork Reservoir	0	0	0					
Blue Joint Creek	5	11,440	286.000					
Little Blue Joint Cr.	1	520	13.000					
Slate Creek	12	5,880	147.000					
Mud Creek	1	400	10.000					
Rombo Creek	1	300	7.500					
Beaver Tail Creek	3	620	15.500					
Nezperce Fork	0	0	0					
Little West Fork	2	400	10.000					
Soda Springs (Bailey) Cr.	1	50	1.250					
Nelson Creek	3	720	18.000					
Ward (Pitney) Creek	1	160	4.000					
Boulder Creek	1	3075					
Boulder Lake	0	0	0					
Pine Creek	1	60	1.500					
Christisen Creek	2	360	9.000					
Lloyd or Selsig Creek	3	1,160	29.000					

*Name of streams indented on the left-hand margin indicate that they are tributaries of the first stream named above which is not indented.

WATER RIGHT DATA — RAVALLI COUNTY APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record)			DECREED RIGHTS		
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No. of No. Decrees	Miner's Inches	Cu. Ft. Per Sec.
Piquett Creek	1	400	10.000			
East Fk. Piquett Cr. ..	1	160	4.000			
House Creek	0	0	0			
Baker Creek	2	240	6.000			
Baker Lake	1	160	4.000			
Pierce Creek	1	100	2.500			
Trapper Creek	4	395	9.875			
Shook (Henry) Creek ..	2	150	3.750			
Unnamed Sloughs	0	0	0			
Leavens Gulch	1	All	0			
Waste	1	1,000	25.000			
Wilber Cooper Gulch ..	1	100	2.500			
East Fork Bitterroot River	13	213,300	5,332.500	1287	(See Bitterroot River)	
Frank Green Creek	1	8200			
Needle Creek	1	80	2.000			
Moose Creek	0	0	0			
Cuba Creek	1	200	5.000			
Unnamed Creek	2	80	2.000			
Dowling Creek	1	100	2.500			
Little Spring Creek	1	All	0			
Mink Creek	1	640	16.000			
Shook Creek or Bunch						
Draw	1	100	2.500			
Tolan (Solon) Creek	3	1,360	34.000	4388	2	570.00
Waste	0	0	0			
Reimel (Pine) Creek	2	3,100	77.500	1460 ¹	2	39.00
Camp Creek	11	1,630	40.750	5074	6	1,108.00
East Fork Camp Cr.	1	1,000	25.000			
Warm Springs	1	160	4.000			
Waugh Gulch	1	100	2.500			
Unnamed Spring	1	50	1.250			
Andrews Creek	1	40	1.000			
Jumble Creek	1	100	2.500			
Cameron Creek	6	2,414	60.356			
Doran Creek	0	0	0			
Unnamed Creek	0	0	0			
Waste	0	0	0			
Bear (Lyman) Creek	1	160	4.000			
Clough Springs	0	0	0			
North Gulch	1	60	1.500			
Unnamed Springs	1	40	1.000			
Pasture Draw (South						
Gulch)	1	60	1.500			
Unnamed Gulches	2	50	1.250			
Sula Creek or Placer						
Gulch	2	400	10.000			
Babbitt Gulch	1	25625			
Spring (Creek) Gulch ..	1	100	2.500			
Warm Springs Creek	3	480	12.000			
Small Springs	1	40	1.000			
Laird Creek	1	25625			
Medicine Tree Creek	1	100	2.500			
Dickson Creek	3	460	11.500			
Williams or Spade Creek	2	1,200	30.000			
South Fork Williams						
or Spade Creek	1	100	2.500			
Sump Pits	1	400	10.000			
Waste	0	0	0			
Hart's Gulch	1	60	1.500	4131	1	12.00
Unnamed Creek	1	All	0			.300

WATER RIGHT DATA — RAVALLI COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record)			DECREED RIGHTS			
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Rye Creek	6	1,668	41.688	6281	7	632.00	15.800
South Fork Rye Creek	0	0	0				
Northeast Fork of So. Fork of Rye Creek	1	120	3.000				
Lowman Creek	0	0	0				
Waste	1	300	7.500				
Unnamed Slough	1	40	1.000				
Chaffin (Miller or Conner) Creek	20	5,660	141.500	2430	24	2,064.50	51.612
Unnamed Two Lakes	1	400	10.000				
Waste	2	All	0				
Unnamed Springs	1	100	2.500				
Waste	1	80	2.000				
Cooper Draw	0	0	0				
Deer (Creek) Hollow	4	1,850	46.250				
McCoy Creek	1	400	10.000				
Tin Cup Creek	14	232,980	5,824.500	4964	75	4,392.86	109.822
Little Tin Cup Creek	3	860	21.500	4964	(See Tin Cup Creek)		
Spoon Creek	2	410	10.250	4964	(See Tin Cup Creek)		
Fern Creek	5	908	22.700	4964	(See Tin Cup Creek)		
Blacktail (Solleder Spring Cr.) Gulch	1	100	2.500				
Unnamed Spring	1	All	0				
Whinnery-McQuirk Gulch	2	100	2.500				
Waste	2	240	6.000				
Unnamed Slough	0	0	0				
Burke Gulch	0	0	0				
Unnamed Springs	1	All	0				
Wells	0	0	0				
Southwick Creek	1	200	5.000				
Unnamed Spring	1	15	.375				
Waste	1	160	4.000				
Unnamed Spring	1	160	4.000				
Waste (Seepage)	2	All	0				
Unnamed Spring	1	80	2.000				
Bunkhouse (Bunk) Creek	4	544	13.600				
Clear Creek	1	11	.275				
Waste	2	300	7.500				
Unnamed Springs	5	All	0				
Townsend Slough	1	40	1.000				
Unnamed Spring	1	All	0				
Unnamed Creek	1	100	2.500				
Unnamed Springs	2	160	4.000				
Overturf Gulch	1	40	1.000				
Unnamed Spring	1	15	.375				
Waste	3	All	0				
Waddell Creek	0	0	0				
Ike Williams Gulch	1	120	3.000				
Wells	0	0	0				
Unnamed Gulch	1	50	1.250				
Waste	1	All	0				
Dick (Squaw) Gulch	2	1,600	40.000				
Unnamed Spring	1	All	0				
Well	0	0	0				
Rock Creek	10	47,170	1,179.250				
Como Lake	3	16,200	405.000				
Little Rock Creek	2	3,280	82.000				
Shannon Gulch	1	200	5.000				
Unnamed Spring	1	All	0				
Spring Creek	1	200	5.000				
Lick Creek	8	6,300	157.500	1509	4	255.60	6.390

WATER RIGHT DATA — RAVALLI COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	No. of Filings	APPROPRIATIONS (Filings of Record)		DECREED RIGHTS		
		Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches Cu. Ft. Per Sec.
Waste (Seepage)	2	50	1.250			
McCarthy Creek	0	0	0	6726	1	25.00 0.625
Waste	1	All	0			
Unnamed Springs	1	All	0			
Lost Horse Creek	20	55,170	1,379.250	1275	11	31,073.00 776.825
Twin Lakes	3	2,400	60.000			
Twelve Mile Lake	1	240	6.000			
Ten Mile Creek	0	0	0			
Ten Mile Lake	1	240	6.000			
South Lost Horse Creek	2	2,400	60.000			
Unnamed Lake	1	240	6.000			
Lost Horse Lake	2	8,000	200.000			
Moose Creek	2	260	6.500			
Waste (Seepage)	1	60	1.500			
Waste	2	All	0			
McKinney Gulch	1	All	0			
Unnamed Drain Ditch	1	All	0			
Unnamed Gulch	1	All	0			
Unnamed Spring	1	All	0			
Unnamed Slough	1	All	0			
Camas Creek	11	8,095	202.375	1237	7	1,235.00 30.875
Camas Lake No. 5	1	400	10.000			
Camas Lake No. 4	1	400	10.000			
Camas Lake No. 3	1	400	10.000			
South Fork Camas Creek	1	2,000	50.000			
Camas Lake No. 2	1	400	10.000			
Unnamed Lakes	2	0	0			
Coyote (Blind Camas) Creek	2	50	1.250			
Unnamed Spring	1	100	2.500			
Unnamed Springs	2	All	0			
Hayes (Horsehead) Cr.	3	195	4.875	2269	2	105.00 2.625
North Fork Hayes Cr.	2	75	1.875			
Waste	1	All	0			
Unnamed Spring	1	All	0			
Waste	1	All	0			
Waste	1	200	5.000			
Unnamed Drain Ditch	1	240	6.000			
Waste (Seepage)	1	100	2.500			
Sleeping Child Creek	14	4,950	123.750	731	6	640.00 16.000
Little Sleeping Child Cr.	5	4,600	115.000			
Jack Creek	0	0	0			
Holmlund-Patterson Drain Ditch	1	100	2.500			
Bear Creek	1	480	12.000			
Unnamed Creek	1	100	2.500			
Gold or Ward Creek	6	1,890	47.250			
Lost Cabin Gulch	1	250	6.250			
Baker or Judd Creek	3	450	11.250			
Unnamed Spring	1	40	1.000			
Waste	2	160	4.000			
Skalkaho Creek	38	52,973	1,324.325	2149	161	33,188.47 829.712
Brennan Creek	1	100	2.500			
Newton Creek	0	0	0			
Unnamed Springs	2	150	3.750			
Waste	1	80	2.000			
Unnamed Springs	1	50	1.250			
Dry Gulch	1	40	1.000			
Spring (Creek) Gulch	2	260	6.500			
Crabbe Gulch	1	120	3.000			
Unnamed Spring	1	80	2.000			

WATER RIGHT DATA — RAVALLI COUNTY APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record)			DECREED RIGHTS			
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Cold Springs Creek	1.....	500.....	12.500				
Waste	1.....	All.....	0				
Wells	0.....	0.....	0				
Roaring Lion Creek	16.....	5,590.....	139.750	846	18	2,172.60	54.315
Roaring Lion Lakes	2.....	320.....	8.000	1132	3	290.00	7.250
Unnamed Sloughs	0.....	0.....	0				
Snake Creek (Drain)	1.....	160.....	4.000				
Unnamed Sloughs	2.....	120.....	3.000				
Sawtooth Creek	15.....	19,420.....	485.500	5032	13	1,195.00	29.875
Owings (Vance) Creek	5.....	450.....	11.250	1063 ¹	2	55.00	1.375
Waste	1.....	80.....	2.000				
Sawmill (Saw Dust or Hallberg) Cr.	4.....	1,670.....	41.750	191	1	100.00	2.500
Hyatt Creek	1.....	50.....	1.250				
Peterson Creek	1.....	800.....	20.000				
Unnamed Drain Ditch	1.....	All.....	0				
Unnamed Gulch	1.....	300.....	7.500				
Spring Creek	1.....	20.....	.500				
Waste	2.....	200.....	5.000				
Unnamed Spring	2.....	80.....	2.000				
Canyon (Barley) Creek	19.....	410,740.....	10,268.500	1503	31	1,399.00	34.975
Canyon Lakes	1.....	All.....	0				
Reeser Creek	1.....	1,000.....	25.000				
Trenary Creek	1.....	200.....	5.000				
Unnamed Draw	1.....	50.....	1.250				
Well	0.....	0.....	0				
Romney or Putnam Gulch	1.....	30.....	.750				
Waste	4.....	80.....	2.000				
Well	0.....	0.....	0				
Spasoff-Hughes Spring	0.....	0.....	0	6342	2	All	0
Waste	1.....	80.....	2.000				
Unnamed Slough	1.....	200.....	5.000				
Waste	1.....	All.....	0				
Unnamed Springs	1.....	300.....	7.500				
C. C. LeSeur Slough	1.....	40.....	1.000				
Gerer Slough	1.....	160.....	4.000				
Waste	4.....	55.....	1.375				
Unnamed Drain Ditch	1.....	100.....	2.500				
Girds (Alkali Gulch) Cr.	6.....	2,000.....	50.000				
Unnamed Springs	4.....	320.....	8.000				
Waste	3.....	160.....	4.000				
Unnamed Springs	3.....	280.....	7.000				
Unnamed Drain Ditch	2.....	510.....	12.750				
Waste	2.....	480.....	12.000				
Blodgett Creek	20.....	9,272.....	231.800	957	43	2,471.00	61.775
Blodgett Lake and High Lake	1.....	0.....	0	3212	1	240.00	6.000
South Fork Blodgett Cr.	1.....	800.....	20.000	3916	2	All	0
Spring Gulch	1.....	40.....	1.000				
Waste	1.....	200.....	5.000				
Unnamed Spring	1.....	80.....	2.000				
Well	0.....	0.....	0				
Churn Creek	1.....	350.....	8.750				
Waste	1.....	All.....	0				
Tamarack Creek	3.....	240.....	6.000	1733	2	120.00	3.000
Well	0.....	0.....	0				
Cow or Pine Tree Gulch	1.....	All.....	0				

WATER RIGHT DATA — RAVALLI COUNTY
APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record)			DECREED RIGHTS			
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Waste	1.....	All	0				
Waste	1.....	All	0				
Unnamed Creek	1.....	100.....	2.500				
Cow or Chief Baptiste (Battee) (Dry Gulch) Creek	11.....	1,810.....	45.250				
Unnamed Gulch	1.....	100.....	2.500				
South Fork Cow or Chief Baptiste Creek	3.....	240.....	6.000				
North Fork Cow or Chief Baptiste Creek	2.....	180.....	4.500				
Unnamed Springs	1.....	80.....	2.000				
Waste	1.....	0.....	0				
Waste	1.....	All	0				
Well	0.....	0.....	0				
Willow Creek	26.....	5,855.....	146.375	931	43	3,946.00	98.650
South Fork Willow Cr. Willow Lake	0.....	0.....	0				
Willow Lake No. 2	5.....	5,000.....	125.000				
Gleason Lake	2.....	2,000.....	50.000				
Spring Creek	1.....	1,000.....	25.000				
North Fork Willow Cr. Butterfly (Third) Creek	1.....	400.....	10.000				
East Fork Butterfly Creek	4.....	1,155.....	28.875				
Stuart (Slick Ear) Creek	3.....	300.....	7.500				
Gibbins Creek	1.....	50.....	1.250				
Waste	1.....	All	0				
Calf (Spring Gulch) Creek	2.....	140.....	3.500				
Little Willow Creek	3.....	450.....	11.250				
Unnamed Draw	1.....	40.....	1.000				
Little Willow Springs	1.....	60.....	1.500				
Waste	1.....	40.....	1.000				
Cow or Collins Creek	8.....	2,770.....	69.250				
Holloran Drain Ditch	1.....	80.....	2.000				
Keffeler Drain	1.....	80.....	2.000				
Unnamed Drain Ditch	1.....	All	0				
Waste	1.....	40.....	1.000				
Unnamed Sloughs	1.....	20.....	.500				
Charley's (Creek) Gulch	2.....	140.....	3.500				
Waste	1.....	40.....	1.000				
Unnamed Springs	1.....	All	0				
Unnamed Creeks	2.....	140.....	3.500				
Waste	2.....	200.....	5.000				
Unnamed Creek	1.....	200.....	5.000				
Waste (Seepage)	1.....	100.....	2.500				
Unnamed Spring	1.....	300.....	7.500				
Unnamed Creeks	2.....	200.....	5.000				
Willow Creek Drain (Ditch or District)	5.....	420.....	10.500				
Well	0.....	0.....	0				
Waste	1.....	All	0				
Coal Pit (Creek) Hollow	3.....	240.....	6.000				
Waste	3.....	80.....	2.000				
Keffeler-Kennedy-Hol- loran Drain Ditch	1.....	80.....	2.000				
Soft Rock (Dry Gulch or Elijah) Creek	3.....	280.....	7.000				
Waste (Seepage)	2.....	480.....	12.000				
Well	0.....	0.....	0				

WATER RIGHT DATA — RAVALLI COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	No. of Filings	APPROPRIATIONS (Filings of Record)		DECREED RIGHTS			
		Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Crystal Springs	1	1,000	25.000				
Waste (Seepage)	2	340	8.500				
Dry (Gulch) Creek	3	1,400	35.000				
Unnamed Springs	2	260	6.500				
Waste (Seepage)	1	200	5.000				
Holloran Gulch	1	350	8.750	4503	2	200.00	5.000
Unnamed Creek	1	All	0				
Unnamed Gulch	2	160	4.000				
Waste	1	160	4.000				
Mill Creek	21	5,574	139.350	565	39	3,366.40	84.160
Mill Lake	1	3,000	75.000				
Lockwood Lake	1	2,400	60.000				
Unnamed Gulch	1	50	1.250				
Unnamed Springs	2	200	5.000				
Tag Alder Creek	3	620	15.500	4665	5	240.00	6.000
Ghost Creek	1	72	1.800				
Unnamed Springs	1	100	2.500				
Browning or McRae (Gulch) Creek	2	160	4.000				
Middle McRae Creek	1	All	0				
Unnamed Gulch	0	0	0				
Waste	1	100	2.500				
Cow (Cowan or Gries- son) Creek	5	510	12.750	4401	3	250.00	6.250
South Fork Cow Cr.	1	80	2.000	2204	2	62.00	1.550
Sage (Lucky Bill) Cr.	3	290	7.250				
Sheridan Gulch	0	0	0				
North Fork Cow Cr.	1	All	0				
Waste	1	All	0				
Sheafman (Schiffman) Creek	4	760	19.000	1620	18	2,140.00	53.500
Read Springs	1	50	1.250				
Unnamed Springs	1	150	3.750				
Waste	1	80	2.000				
Bourne (Creek) Gulch	3	685	17.125				
Unnamed Draw	2	270	6.750				
Waste (Seepage)	1	80	2.000				
Fred Burr Creek	23	16,775	419.375	724	30	3,068.76	76.719
Unnamed Spring	2	All	0	4265	1	All	0
Waste (Seepage)	2	All	0				
Unnamed Swamps	0	0	0				
Waste	1	120	3.000				
Waste (Seepage)	3	840	21.000				
Wells	0	0	0				
Coyote Gulch	1	120	3.000				
South Fk. Coyote Gulch	2	30750				
Waste	0	0	0				
Unnamed Slough	1	100	2.500				
Waste	2	320	8.000				
South Birch Creek	10	1,260	31.500				
South Fork South Birch Creek	2	1,160	29.000				
Waste	0	0	0				
Unnamed Springs	2	550	13.750				
Gayen Gulch	2	0	0				
Waste	1	All	0				
Crooked Creek	2	260	6.500				
Unnamed Gulch	1	200	5.000				
Well	0	0	0				
Bear Creek	29	13,786	344.650	1337	62	4,908.00	122.700
South Fork Bear Creek	0	0	0				

WATER RIGHT DATA — RAVALLI COUNTY

APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record)			DECREED RIGHTS			
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Unnamed Lake	1.....	4,000.....	100.000				
Two Lakes		(See Bryan Lake)					
South Fk. Bear Cr. Lake	1.....	2,000.....	50.000				
Middle Fork Bear Creek	0.....	0.....	0				
Bryan Lake	3.....	7,720.....	193.000				
Unnamed Spring	0.....	0.....	0				
North Fork Bear Creek	0.....	0.....	0				
Unnamed Lake	1.....	All.....	0				
South Channel Bear Creek	3.....	780.....	19.500.....	1337		(See Bear Creek)	
Unnamed Spring	1.....	40.....	1.000				
North Channel Bear Creek	3.....	1,160.....	29.000.....	1337		(See Bear Creek)	
Unnamed Spring	1.....	60.....	1.500				
Waste (Seepage)	1.....	200.....	5.000				
Woodmancy Slough	5.....	220.....	5.500				
Waste (Seepage)	2.....	1,080.....	27.000				
Humble Drain Ditch	1.....	3,000.....	75.000				
Bunkhouse (Bunk) Creek	3.....	400.....	10.000				
Unnamed Springs	2.....	60.....	1.500				
Unnamed Sloughs	2.....	1,000.....	25.000				
Birch or Simmons (Gaven Gulch) Creek	3.....	300.....	7.500				
Zacha Gulch	3.....	40.....	1.000				
Waste	1.....	All.....	0				
Branch Creek	1.....	500.....	12.500				
Unnamed Springs	4.....	268.....	6.700				
Kirchner (Roll) Slough	3.....	40.....	1.000.....	3955	1....	25.00....	.625
Horning Slough	1.....	80.....	2.000				
Waste	1.....	25.....	.625				
Unnamed Spring	1.....	700.....	17.500				
Unnamed Slough	0.....	0.....	0				
Spooner Creek	5.....	735.....	18.375				
Unnamed Swamp	1.....	300.....	7.500				
Spooner Dry Gulch	3.....	300.....	7.500				
Spring Gulch	0.....	0.....	0.....	3356	1....	40.00....	1.000
Waste	5.....	120.....	3.000				
Sweathouse Creek	20.....	9,616,170.....	240,404.250.....	1011	41....	4,143.00....	103.575
Glen Lake	1.....	All.....	0				
Spring Creek	1.....	All.....	0				
Waste (Seepage)	1.....	All.....	0				
Waste	1.....	20.....	.500				
Gash Creek	9.....	5,522.....	138.050				
South Fork Gash Cr. Waste	1.....	150.....	3.750				
Smith Creek	5.....	960.....	24.000.....	800	6....	390.00....	9.750
Unnamed Slough	1.....	160.....	4.000				
Unnamed Springs	1.....	80.....	2.000				
Waste	2.....	60.....	1.500				
Unnamed Drain Ditch	0.....	0.....	0.....	7961	3....	All....	0
Waste	1.....	40.....	1.000				
Unnamed Spring	1.....	25.....	.625				
Fulkerson (Sawmill) Creek	5.....	420.....	10.500				
Parker Gulch	1.....	50.....	1.250				
Waste	1.....	All.....	0				
Unnamed Spring	1.....	500.....	12.500				
Willoughby (Dry Gulch) Creek	9.....	1,250.....	31.250				
North Fork Willoughby Creek	1.....	120.....	3.000.....	2858	2....	All....	0
Unnamed Spring	1.....	40.....	1.000				
Cabin Creek	1.....	200.....	5.000				

WATER RIGHT DATA — RAVALLI COUNTY **APPROPRIATIONS AND DECREES BY STREAMS**

STREAMS	APPROPRIATIONS (Filings of Record)			DECREED RIGHTS			
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Sheep Corral or Willow Creek	1	350	8.750				
South Fork or Davis Creek	5	520	13.000				
McIntyre Reservoir	0	0	0				
Unnamed Spring	1	200	5.000				
Spring Creek	2	360	9.000				
Unnamed Springs	1	All	0				
Waste	1	40	1.000				
Waste	3	160	4.000				
Goose Neck Branch	1	200	5.000				
Unnamed Springs	2	5	.125				
Unnamed Gulch	1	200	5.000				
Waste	1	All	0				
Unnamed Gulch	1	160	4.000				
Unnamed Spring	1	60	1.500				
Waste	1	All	0				
Unnamed Creek	1	150	3.750				
Big Creek	28	22,220	555.500	1071	36	4,499.50	112.488
				1712	1	40.00	1.000
				6972	2	145.00	3.625
Big Creek Lakes	3	3,000	75.000	1447	2	61,252.00	1,531.300
South Fork Big Creek	1	500	12.500				
St. Mary (Shiloh) Creek	0	0	0				
St. Mary Lake	1	500	12.500				
Shiloh Lake	1	500	12.500				
Waste	2	All	0				
Whippoorwill Gulch	1	All	0				
Waste	4	All	0				
Unnamed Slough	1	200	5.000				
Unnamed Gulch	1	10	.250				
Waste	1	36	.900				
Unnamed Slough	1	480	12.000				
Waste	4	All	0				
Unnamed Slough	1	160	4.000				
Unnamed Drain Ditch	1	100	2.500				
Waste	1	All	0				
Unnamed Spring	1	50	1.250				
Freece Gulch	3	480	12.000				
Waste	1	All	0				
Unnamed Gulch	1	All	0				
Pine (Gulch or Canyon) Hollow	2	100	2.500				
Unnamed Spring	1	160	4.000				
Waste	2	140	3.500				
South Swamp Creek	1	120	3.000	556	(See Burnt Fork Bitterroot R.)		
				1662	1	10.00	.250
Sump	0	0	0				
Robertson Creek	0	0	0	556	(See Burnt Fork Bitterroot R.)		
Waste	2	200	5.000				
Unnamed Drain Ditch	2	All	0				
Waste	1	40	1.000				
Weisenflue Slough	1	160	4.000				
Waste	2	80	2.000				
Unnamed Drain Ditch	1	7	.167				
Waste (Seepage)	1	0	0				
North Swamp Creek	4	415	10.375	566	(See Burnt Fork Bitterroot R.)		
				1313	1	200.00	5.000
Sapiel Creek	0	0	0				
McCalla (McKellar) Creek	4	1,720	43.000	971	9	795.00	19.875
Spring Creek	1	100	2.500				

WATER RIGHT DATA — RAVALLI COUNTY **APPROPRIATIONS AND DECREES BY STREAMS**

STREAMS	APPROPRIATIONS (Filings of Record)			DECREED RIGHTS			
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Waste (Seepage)	1.....	40.....	1.000				
Shallow Creek	2.....	240.....	6.000				
Waste	1.....	All.....	0				
Westler Gulch	2.....	250.....	6.250				
Unnamed Creek	0.....	0.....	0				
Waste	1.....	60.....	1.500				
Unnamed Spring	1.....	240.....	6.000				
Silverthorn Creek	2.....	160.....	4.000				
Waste	1.....	80.....	2.000				
Skaggs Creek	2.....	160.....	4.000				
Foust Well	0.....	0.....	0				
Kennedy Creek	2.....	260.....	6.500				
Million Gulch	1.....	100.....	2.500				
Sharratt (Cherreete or Cherette) Creek	9.....	2,930.....	73.250	3451	7	910.00	22.750
Larson Creek	1.....	60.....	1.500				
Unnamed Creek	1.....	170.....	4.250				
Kootenai (Mill or Lyons) Creek	17.....	26,236.....	655.900	1569	18	4,035.00	100.875
Drogitis Well	0.....	0.....	0				
Mill Fork Creek	5.....	1,760.....	44.000	556	(See Burnt Fork Bitterroot R.)		
Waste (Seepage)	3.....	80.....	2.000				
Burnt Fk. Bitterroot River	11.....	4,145.....	103.652	556	125	15,675.71	391.893
Burnt Fork Lake	4.....	2,600.....	65.000				
Smythe Creek	1.....	100.....	2.500				
Sawmill Creek	1.....	160.....	4.000				
Haacke Creek	1.....	160.....	4.000				
Unnamed Springs	1.....	100.....	2.500				
Clairmont Creek	1.....	200.....	5.000				
Unnamed Springs	1.....	100.....	2.500				
South Burnt Fork Creek	5.....	3,326.....	83.150	556	(See Burnt Fork Bitterroot R.)		
				3822	1	100.00	2.500
North Burnt Fork (Spring) Creek	29.....	11,976.....	299.400	556	(See Burnt Fork Bitterroot R.)		
				3823	1	100.00	2.500
Slocum (Spoonier) Creek	6.....	1,050.....	26.250				
Unnamed Swamp	1.....	300.....	7.500				
Waste	1.....	40.....	1.000				
Unnamed Creek	1.....	450.....	11.250				
Waste	7.....	300.....	7.500				
Unnamed Drain Ditch	1.....	All.....	0				
Brooks Creek	2.....	700.....	17.500	1570	2	640.00	16.000
Pine Gulch	1.....	All.....	0				
Unnamed Spring	1.....	100.....	2.500				
Waste	2.....	210.....	5.250				
Unnamed Creek	1.....	400.....	10.000				
Unnamed Slough	1.....	200.....	5.000				
Ralph Creek	1.....	60.....	1.500				
Bass Creek	19.....	6,207.....	155.175	1488	20	3,748.00	93.700
Bass Lake	0.....	0.....	0	6612	1	32,594.40	814.860
				8562	1	40,000.00	1,000.000
South Channel Bass Creek	1.....	160.....	4.000	1488	(See Bass Creek)		
Waste	0.....	0.....	0				
North Channel Bass Creek	3.....	440.....	11.000	1488	(See Bass Creek)		
Waste	1.....	160.....	4.000				
Larry Creek	7.....	1,664.....	41.600	306	(See Barnaby Creek)		
Rogman (French Edor Spring) Creek	3.....	1,650.....	41.250				
Dry Creek	3.....	800.....	20.000				

WATER RIGHT DATA — RAVALLI COUNTY
APPROPRIATIONS AND DECREES BY STREAMS

STREAMS	APPROPRIATIONS (Filings of Record)			DECREED RIGHTS			
	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Unnamed Swamp	1	500	12.500				
Swamp Creek	1	400	10.000				
Waste	2	300	7.500				
Unnamed Drain Ditch	1	All	0				
Waste (Seepage)	2	400	10.000				
Waste	2	All	0				
Three Mile Creek	27	7,300	182.500	283	3	591.00	14.775
Unnamed Springs	1	150	3.750				
Wheelbarrow Creek	1	300	7.500	283	(See Three Mile Creek)		
Gray Horse Creek	3	230	5.750	283	(See Three Mile Creek)		
Waste	5	200	5.000				
Ambrose Creek	10	3,000	75.000				
Waste	1	All	0				
Unnamed Creek	2	240	6.000				
Unnamed Swamp	1	200	5.000				
Waste (Seepage)	1	All	0				
Sheep (Gulch) Creek	3	380	9.500				
Unnamed Gulch	1	80	2.000				
Waste	2	All	0				
Unnamed Springs	0	0	0				
Unnamed Creek	1	100	2.500				
Unnamed Gulch	2	340	8.500				
Waste	1	100	2.500				
Unnamed Springs	0	0	0				
Unnamed Slough	1	200	5.000				
Dry Gulch	5	1,295	32.375				
Waste (Seepage)	1	All	0				
Unnamed Gulch	1	All	0				
Sump Pit	1	400	10.000				
Unnamed Spring	1	All	0				
Unnamed Creek	1	60	1.500				
Waste	1	All	0				
Unnamed Spring	1	All	0				
Lynch Spring	1	10250				
Sweeney Creek	13	3,880	97.000	933	28	2,562.00	64.050
South Fork Sweeney Cr.	0	0	0				
Sweeney Lake	1	1,000	25.000				
Barnaby (Larry) Creek	1	144	3.600	306	5	558.50	13.963
Dry Gulch	1	160	4.000				
Rogers Creek	1	40	1.000				
Waste	1	100	2.500				
*North Channel Bass Cr.		(See Bass Creek)					
Waste	1	All	0				
Eight Mile Creek	21	5,355	133.875	136	8	930.00	23.250
				4108	1	1,000.00	25.000
South Fork Eight Mile Creek	1	160	4.000				
Spring Basin	1	80	2.000				
White Cloud Creek	1	50	1.250				
Granite Creek	0	0	0				
Unnamed Springs	3	100	2.500				
Unnamed Springs	1	200	5.000				
Waste	0	0	0				
Child's Creek	1	144	3.600				
Poll Creek	1	All	0				
One Horse Creek	18	9,454	236.350	588	20	2,280.00	57.000
Waste (Seepage)	3	186	4.650				
Morris Creek	1	All	0				
Unnamed Springs	2	All	0				

WATER RIGHT DATA — RAVALLI COUNTY **APPROPRIATIONS AND DECREES BY STREAMS**

APPROPRIATIONS (Filings of Record)				DECREED RIGHTS			
STREAMS	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.	Case No.	No. of Decrees	Miner's Inches	Cu. Ft. Per Sec.
Tie Chute Creek	3	77	1.925	6692	1	All	0
Unnamed Spring	1	All	0				
Waste	3	160	4.000				
Woodchuck Creek ²	2	412	10.300				
Carlton Creek	1	400	10.000	1835 ³	2	182.00	4.550
TOTAL	1,555	11,587,988	289,699.711	1,111		341,765.84	8,544.146

* Listed as a tributary to the Bitterroot River, it actually flows into Sweeney Creek.

¹ This decree is recorded and filed both in Missoula County and Ravalli County. The number of filings and number of decrees pertain to Ravalli County only.

² Appropriations for this creek are filed both in Missoula County and Ravalli County. The filings listed here pertain to Ravalli County only.

³ This decree is recorded and filed in Missoula County and applies to Missoula and Ravalli Counties. The number of filings and number of decrees listed here pertain to Ravalli County only.

⁴ A "Ditch Decree," defining the capacity and water rights pertaining to a particular ditch system.

DRAINAGES IN RAVALLI COUNTY NOT LOCATED

STREAMS	No. of Filings	Miner's Inches	Cu. Ft. Per Sec.
Dew Creek	1	1,000.00	25.000
East Trail Creek	1	All	0
Elk Horn Creek	1	All	0
Eneas Creek	1	40.00	1.000
Fred Branch Creek	1	250.00	6.250
John Buker Lake	1	250.00	6.250
Kelley Gulch	1	50.00	1.250
Kinen Creek	1	500.00	12.500
McCann's Creek	1	All	0
Montgomery Creek	1	2,000.00	50.000
Nutten Creek	1	600.00	15.000
St. Louis Gulch	1	200.00	5.000
Unnamed Creeks	3	200.00	5.000
Unnamed Springs	3	202.00	5.050
Unnamed Slough	1	All	0
TOTAL	19	5,292.00	132.300

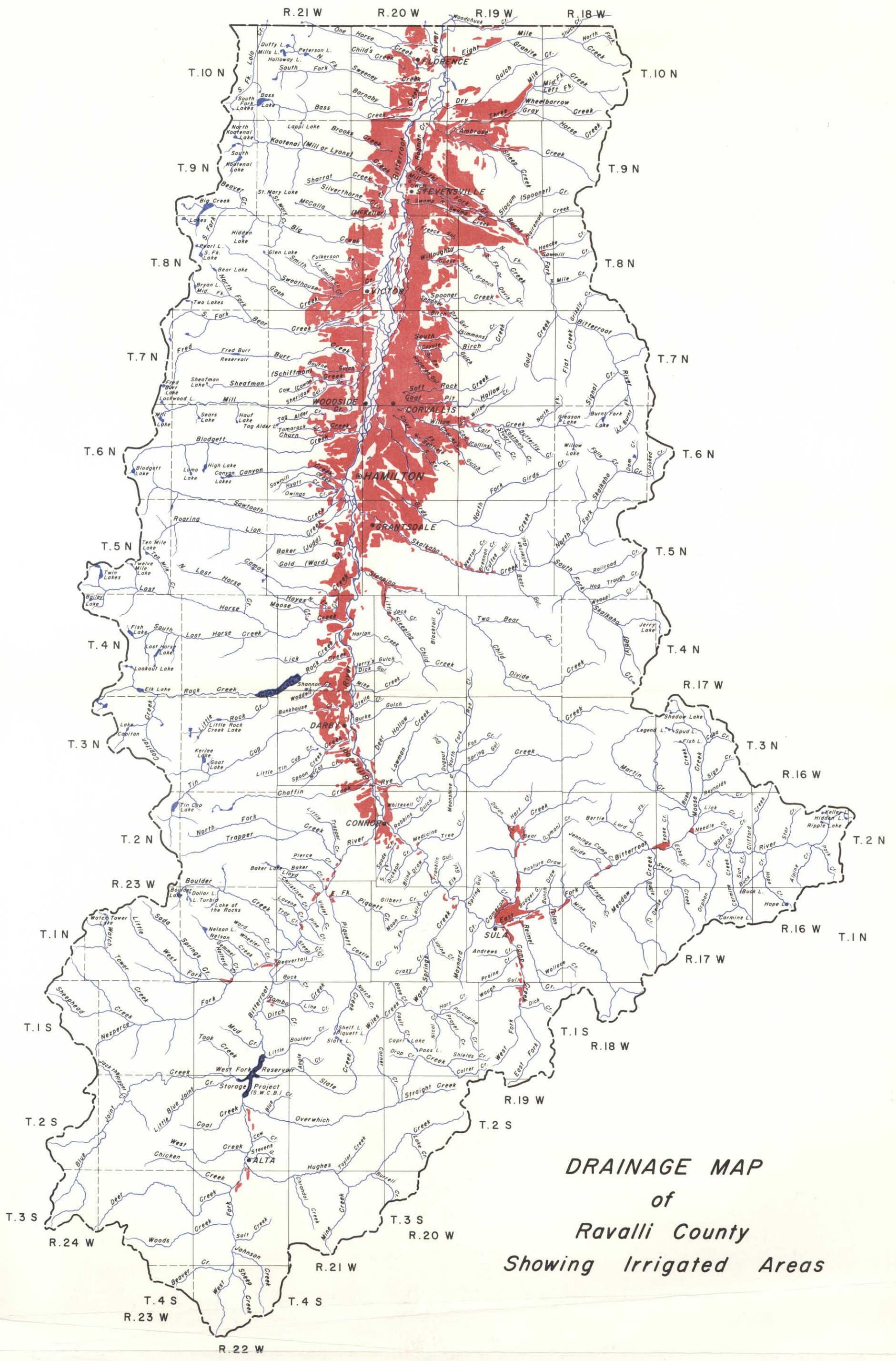
WATER RESOURCES SURVEY

Ravalli County, Montana

Part II

Maps Showing Irrigated Areas

Published by
STATE ENGINEER'S OFFICE
Helena, Montana
June, 1958
Reprinted as of June, 1965



DRAINAGE MAP
of
Ravalli County
Showing Irrigated Areas

MAP INDEX

Township	Range	Page	Township	Range	Page
1 South	19 West	1	4 North	21 West	16
1 South	22 West	2	5 North	19 West	17
2 South	22 West	3	5 North	20 West	18
3 South	22 West	4	5 North	21 West	19
1 North	18 West	5	6 North	19 West	20
1 North	19 West	6	6 North	20 West	21
1 North	20 West	6	6 North	21 West	22
1 North	21 West	7	7 North	20 West	23
1 North	22 West	8	7 North	21 West	24
2 North	17 West	9	8 North	19 West	25
2 North	18 West	5	8 North	20 West	26
2 North	19 West	10	8 North	21 West	27
2 North	20 West	11	9 North	19 West	28
2 North	21 West	12	9 North	20 West	29
3 North	20 West	13	10 North	19 West	30
3 North	21 West	14	10 North	20 West	31
4 North	20 West	15			

MAP SYMBOL INDEX

BOUNDARIES

- COUNTY LINE
- NATIONAL FOREST LINE

DITCHES

- ~ CANALS OR DITCHES
- > DRAIN DITCHES
- > PROPOSED DITCHES

STRUCTURES & UNITS

- / DAM
- ≡ DIKE
- ≡ FLUME
- ≡ SIPHON
- ≡ SPILL
- ☼ SPRINKLER SYSTEM
- ≡ WEIR
- ≡ PIPE LINE
- PUMP
- PUMP SITE
- ≡ RESERVOIR
- ⊕ WELL
- +++ NATURAL CARRIER USED AS DITCH

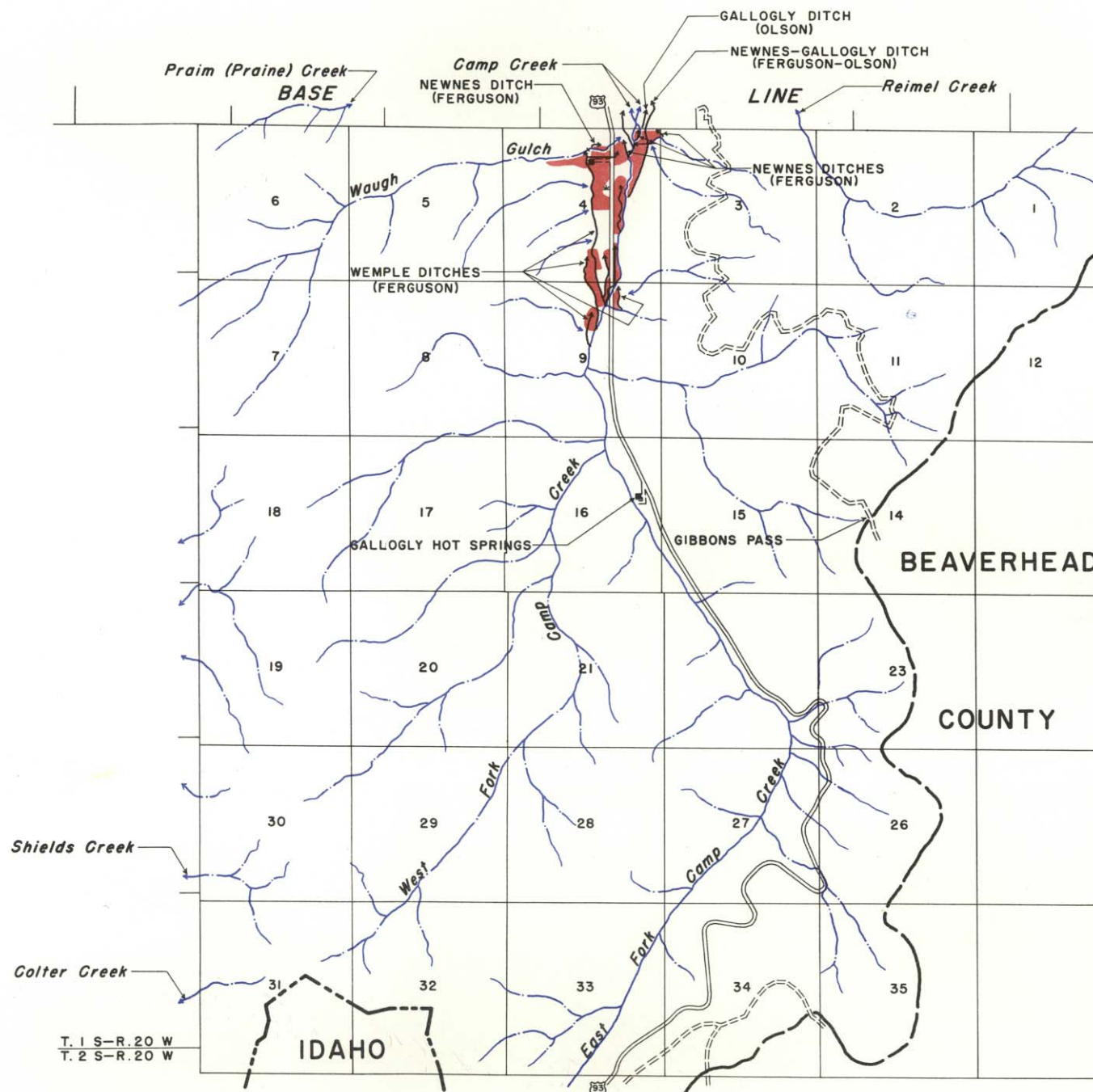
TRANSPORTATION

- == PAVED ROADS
- === UNPAVED ROADS
- ++ RAILROADS
- 10 STATE HIGHWAY
- 89 U. S. HIGHWAY
- ◇ AIRPORT
- * SPRING
- ≡ SWAMP
- ⊗ GAUGING STATION
- POWER PLANT
- ⊗ STORAGE TANK
- ⊕ CEMETERY
- ⊙ FAIRGROUND
- FARM OR RANCH UNIT
- ▲ LOOKOUT STATION
- ▲ RANGER STATION
- - - RAILROAD TUNNEL
- SCHOOL
- ⚡ SHAFT, MINE, OR DRIFT

Twp. 1 SOUTH
Rge. 19 WEST

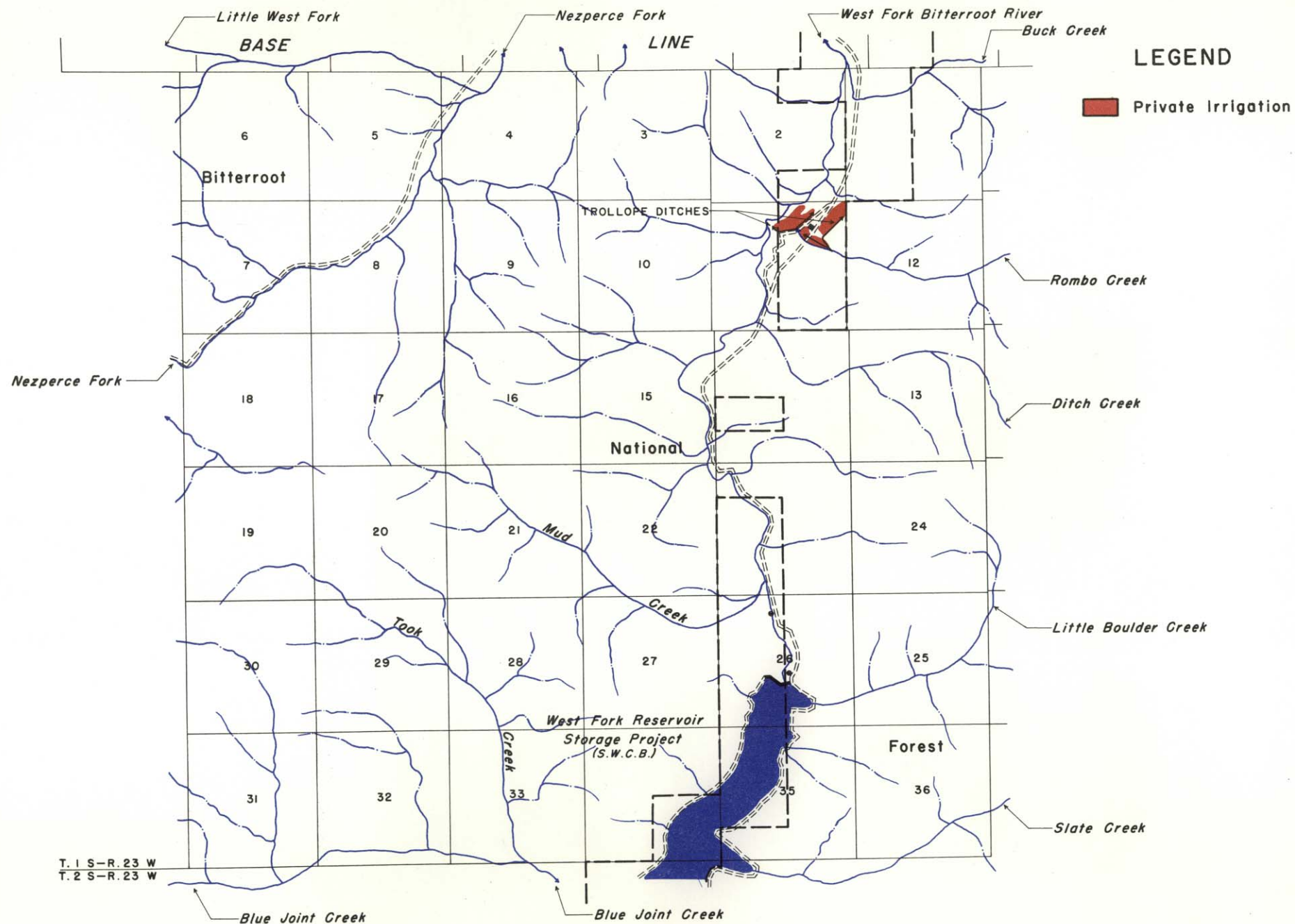
LEGEND

 Private Irrigation



T. 1 S—R. 20 W
T. 2 S—R. 20 W

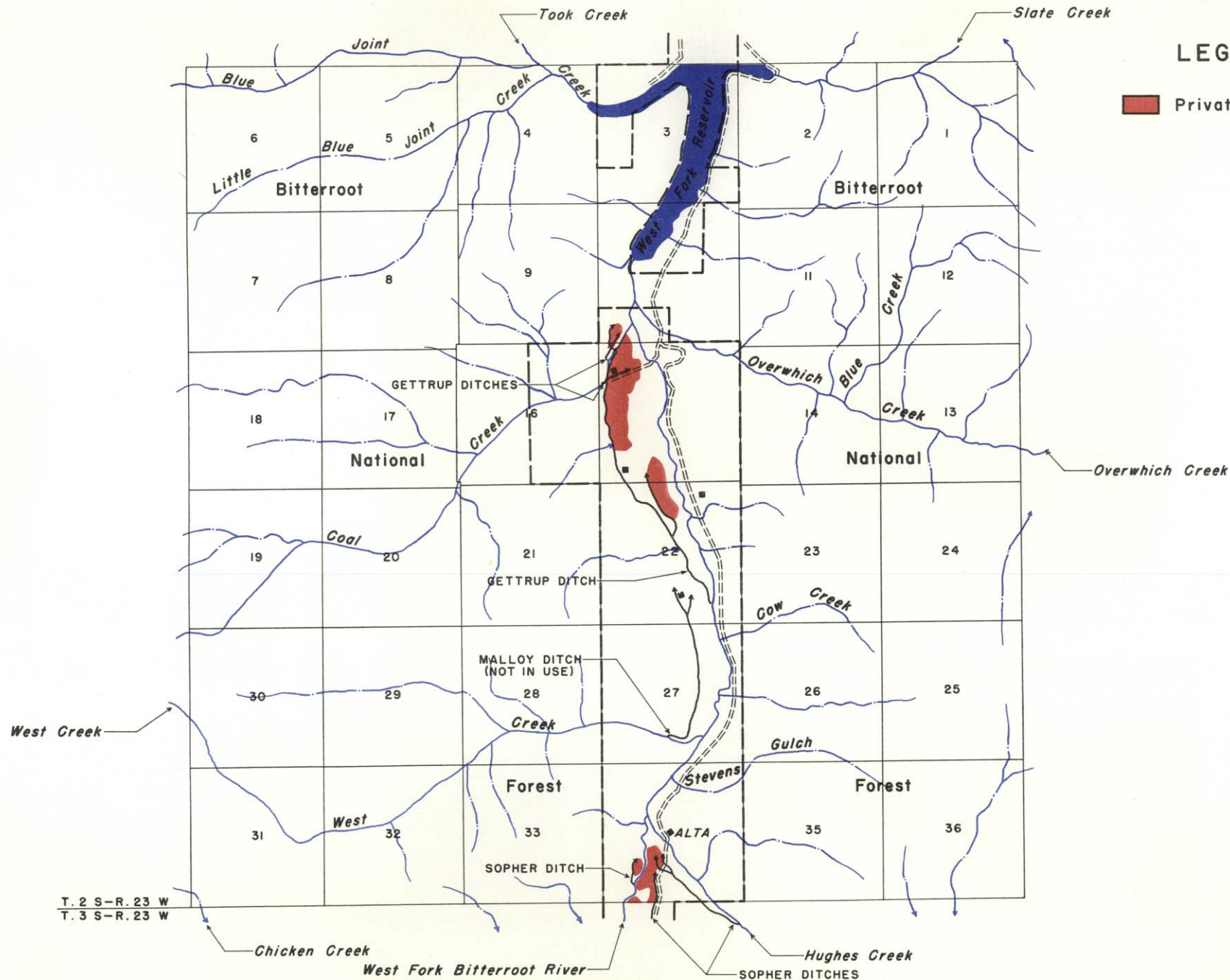
Twp. 1 SOUTH
Rge. 22 WEST



Twp. 2 SOUTH
Rge. 22 WEST

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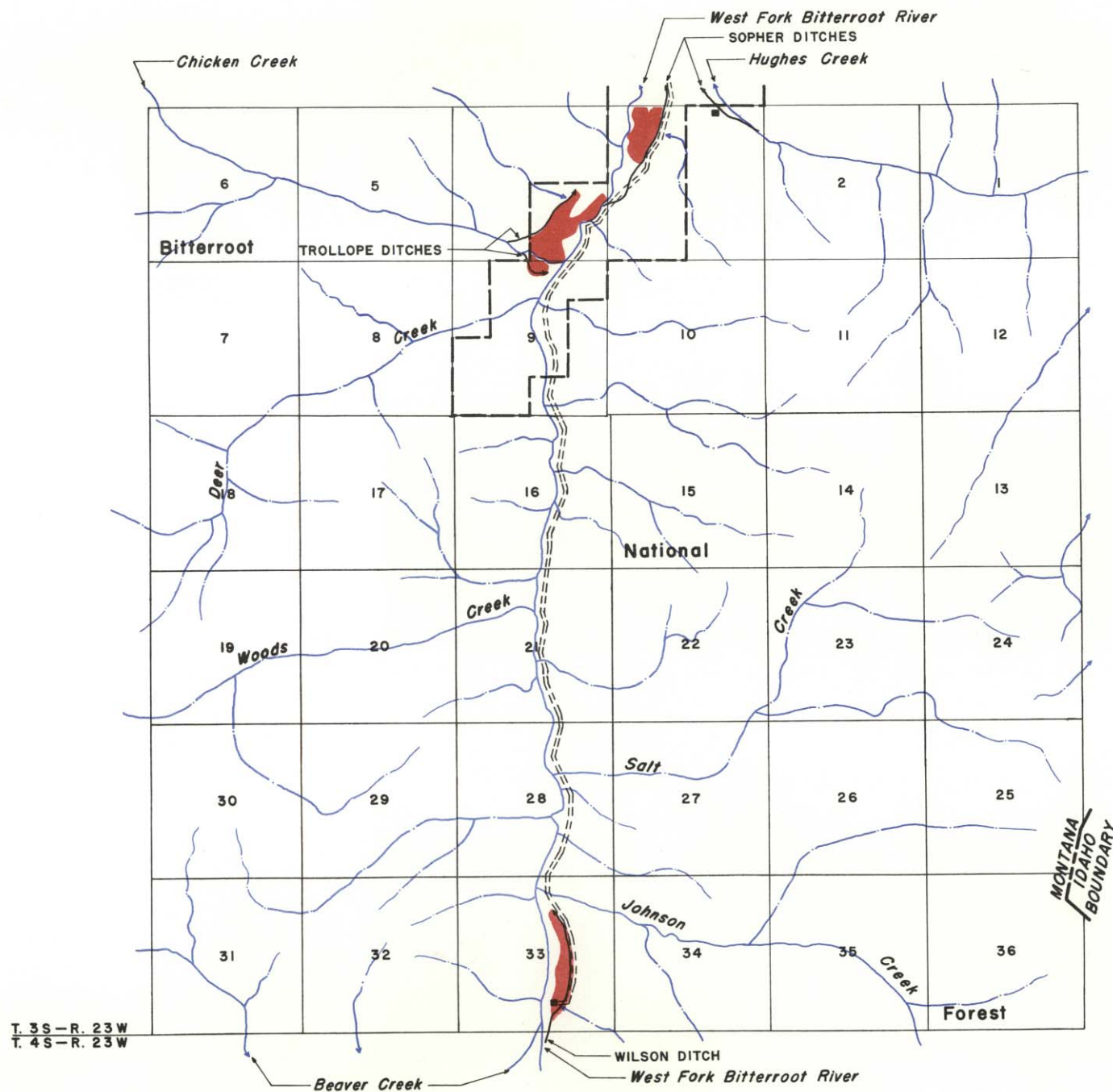
 Private Irrigation



Twp. 3 SOUTH
Rge. 22 WEST

LEGEND

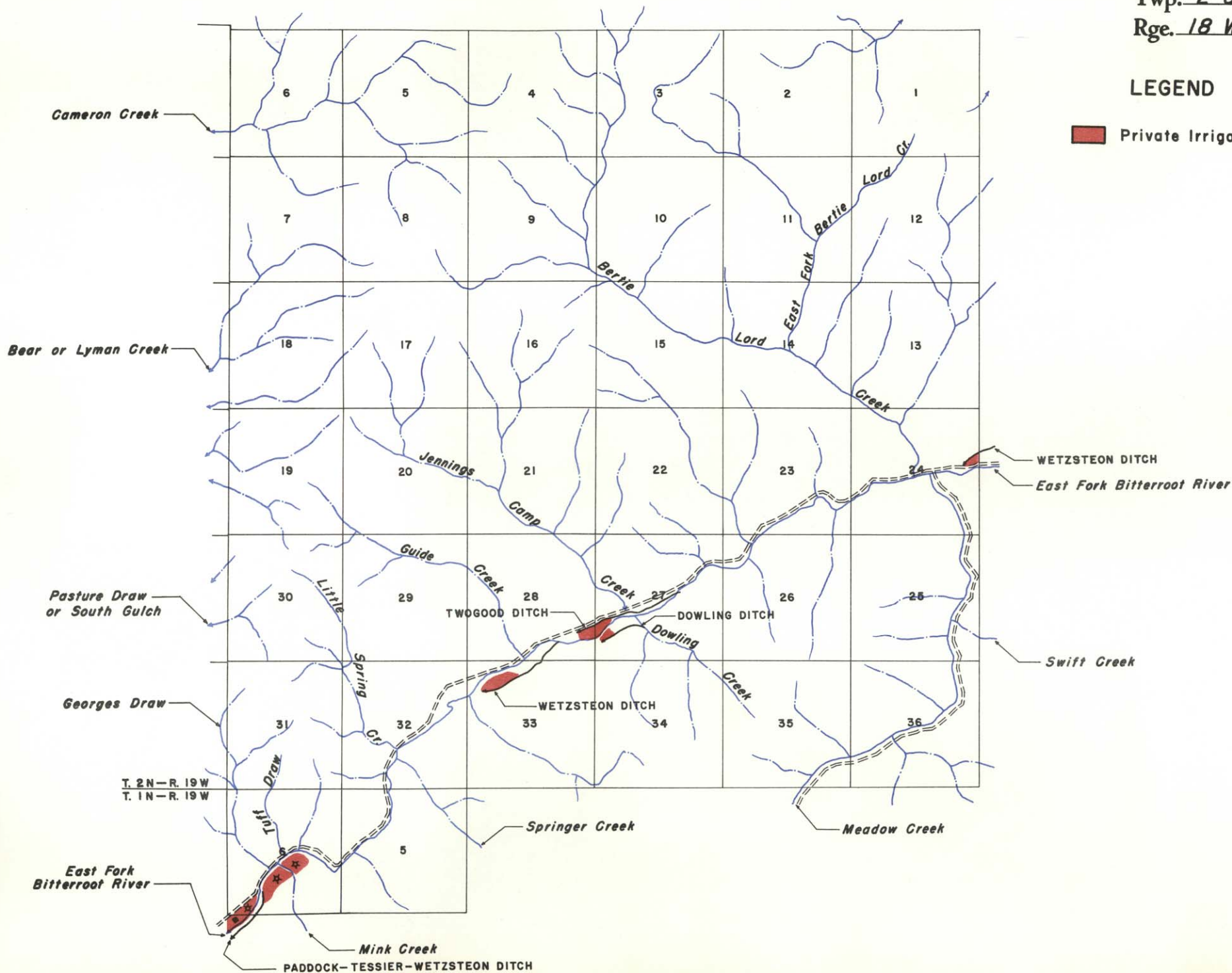
 Private Irrigation



Twp. 28 NORTH
Rge. 18 WEST

LEGEND

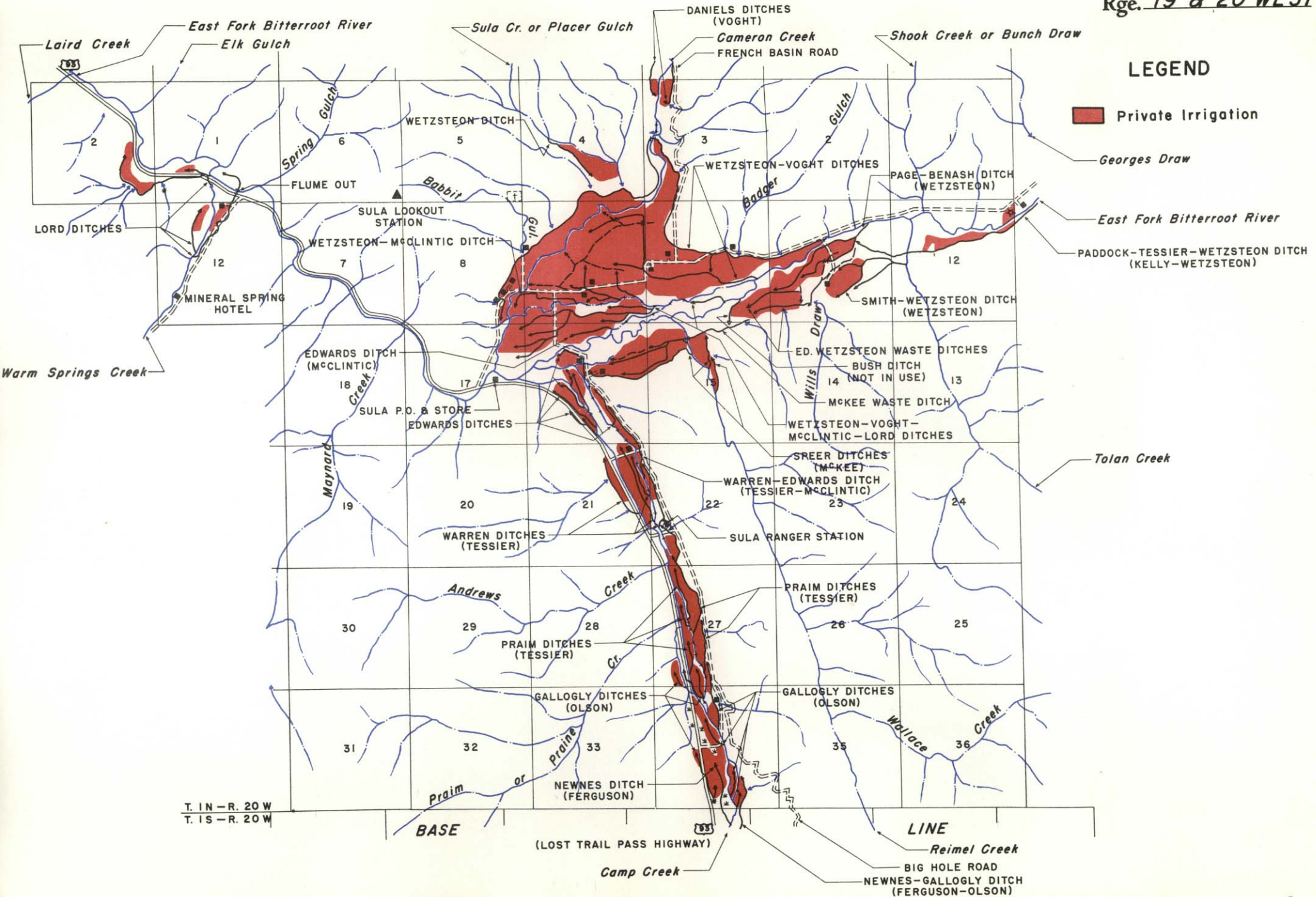
 Private Irrigation



Twp. 1 NORTH
Rge. 19 & 20 WEST

LEGEND

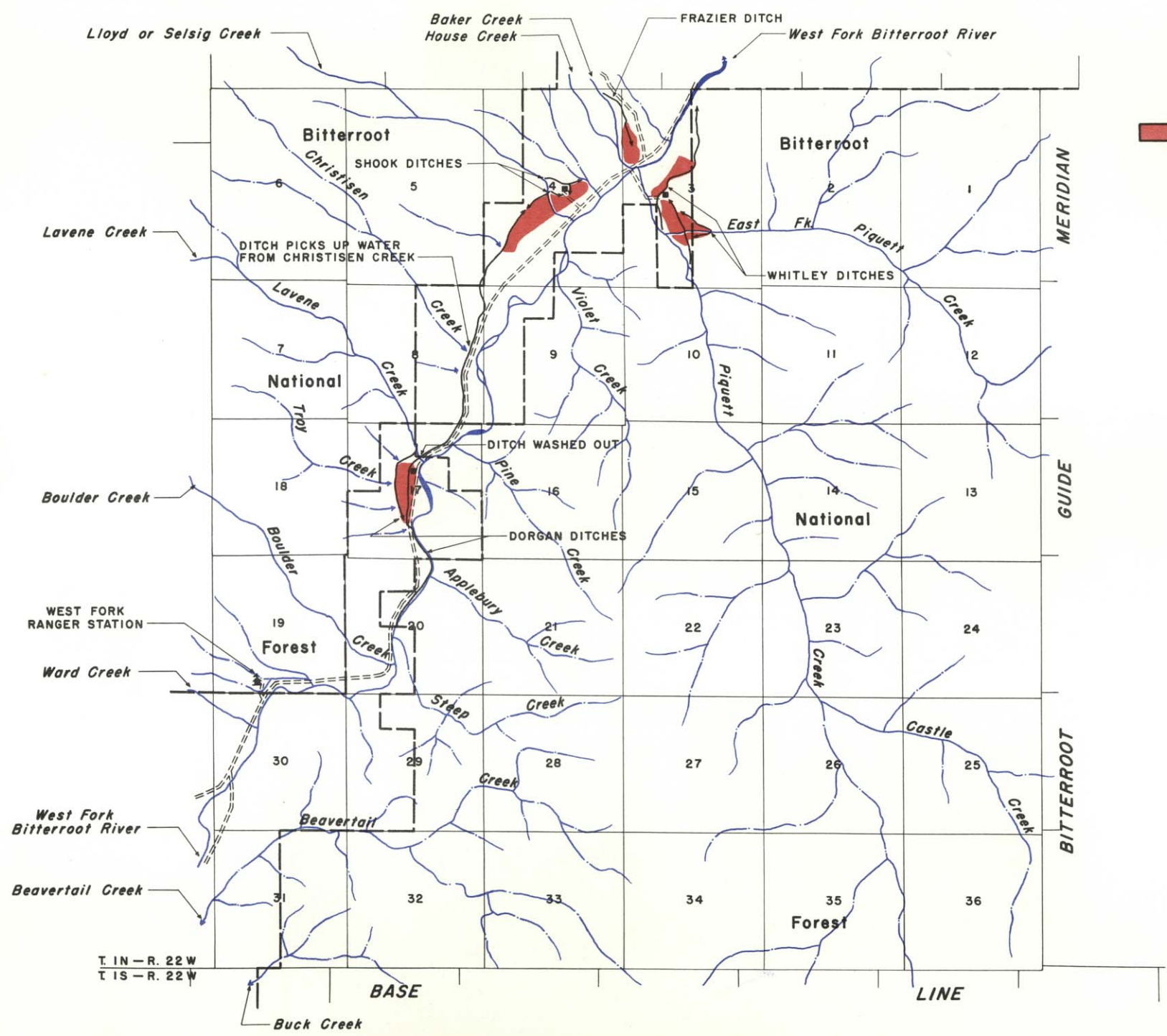
Private Irrigation



Twp. 1 NORTH
 Rge. 21 WEST

LEGEND

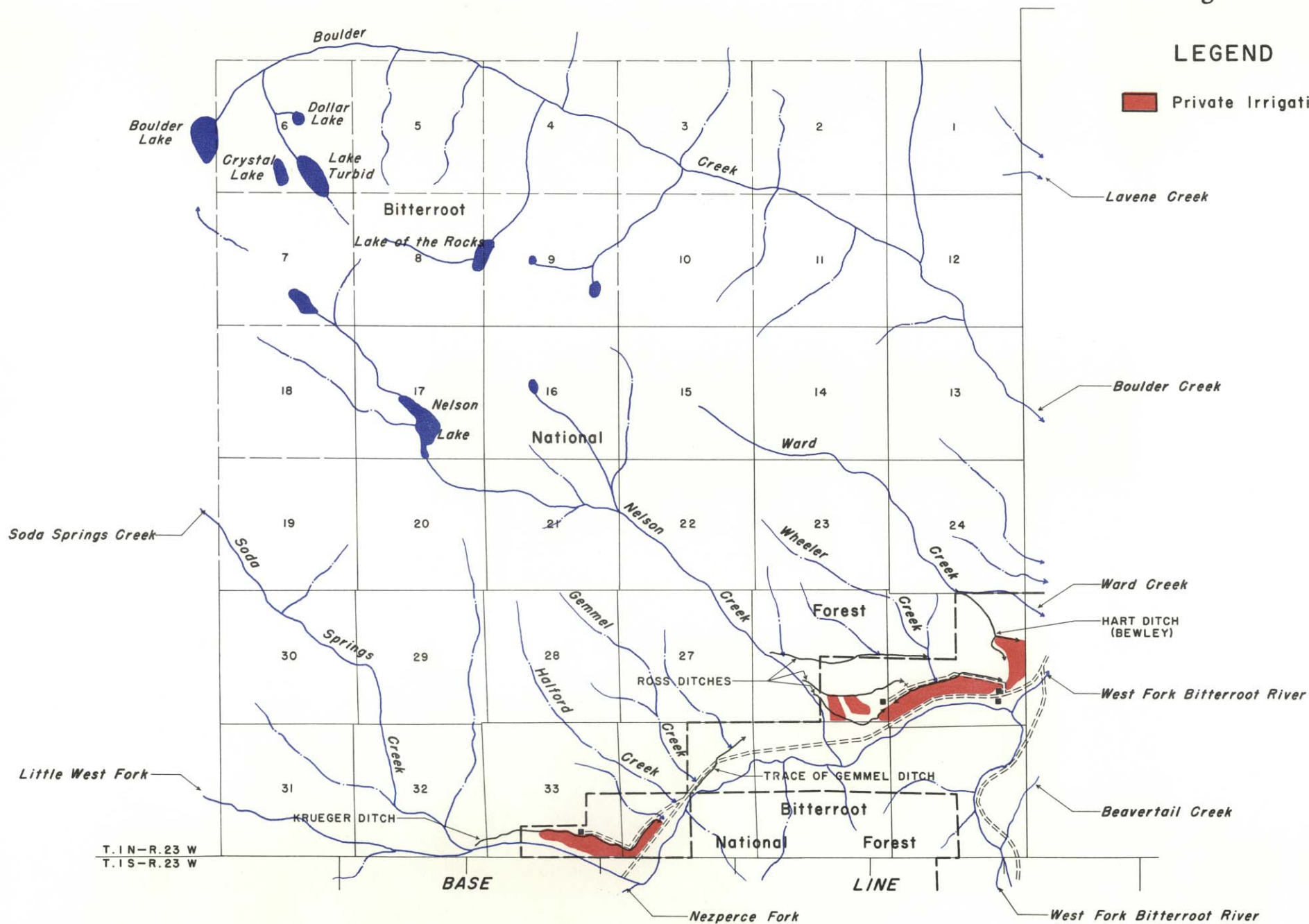
Private Irrigation



Twp. 1 NORTH
Rge. 22 WEST

LEGEND

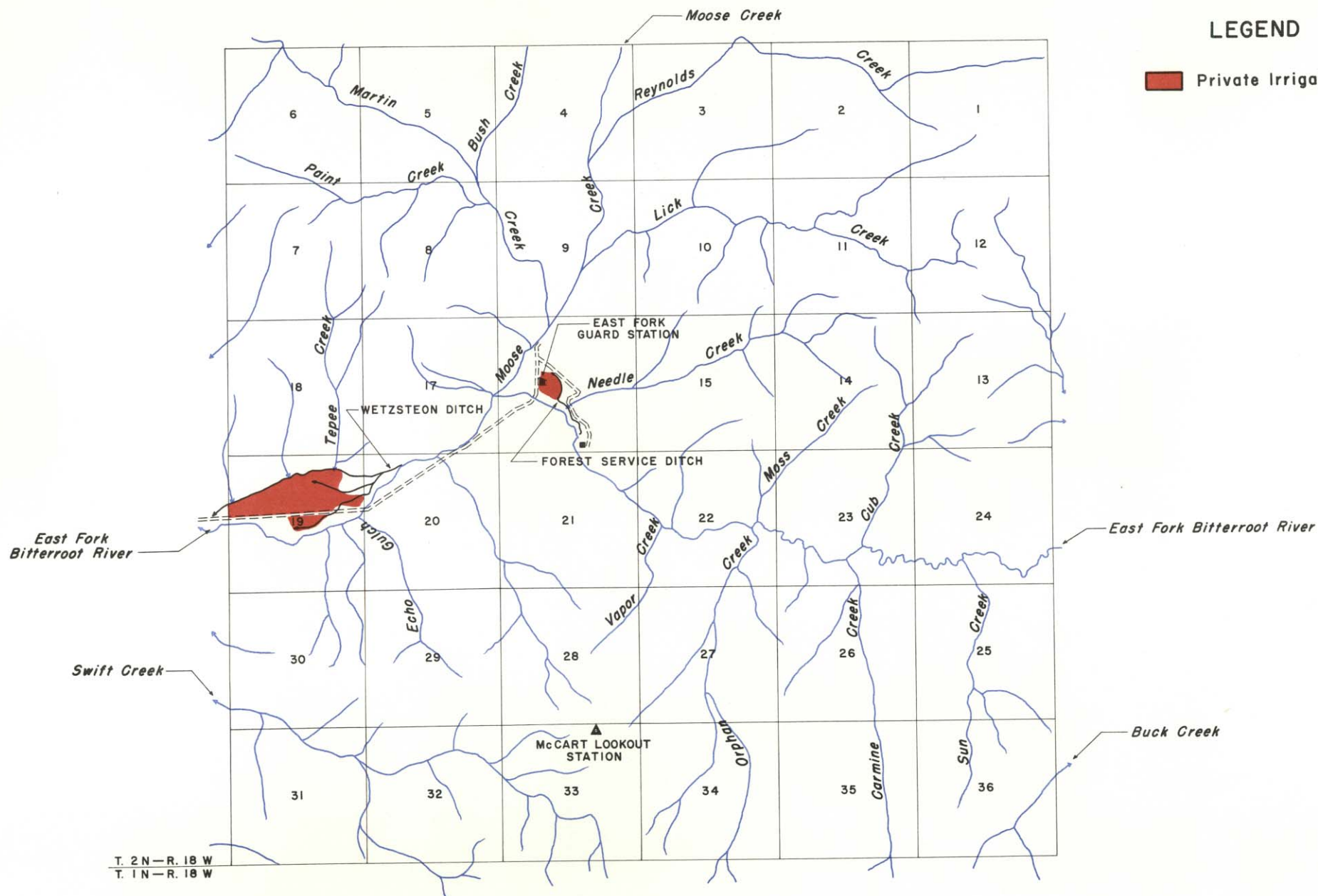
 Private Irrigation



Twp. 2 NORTH
Rge. 17 WEST

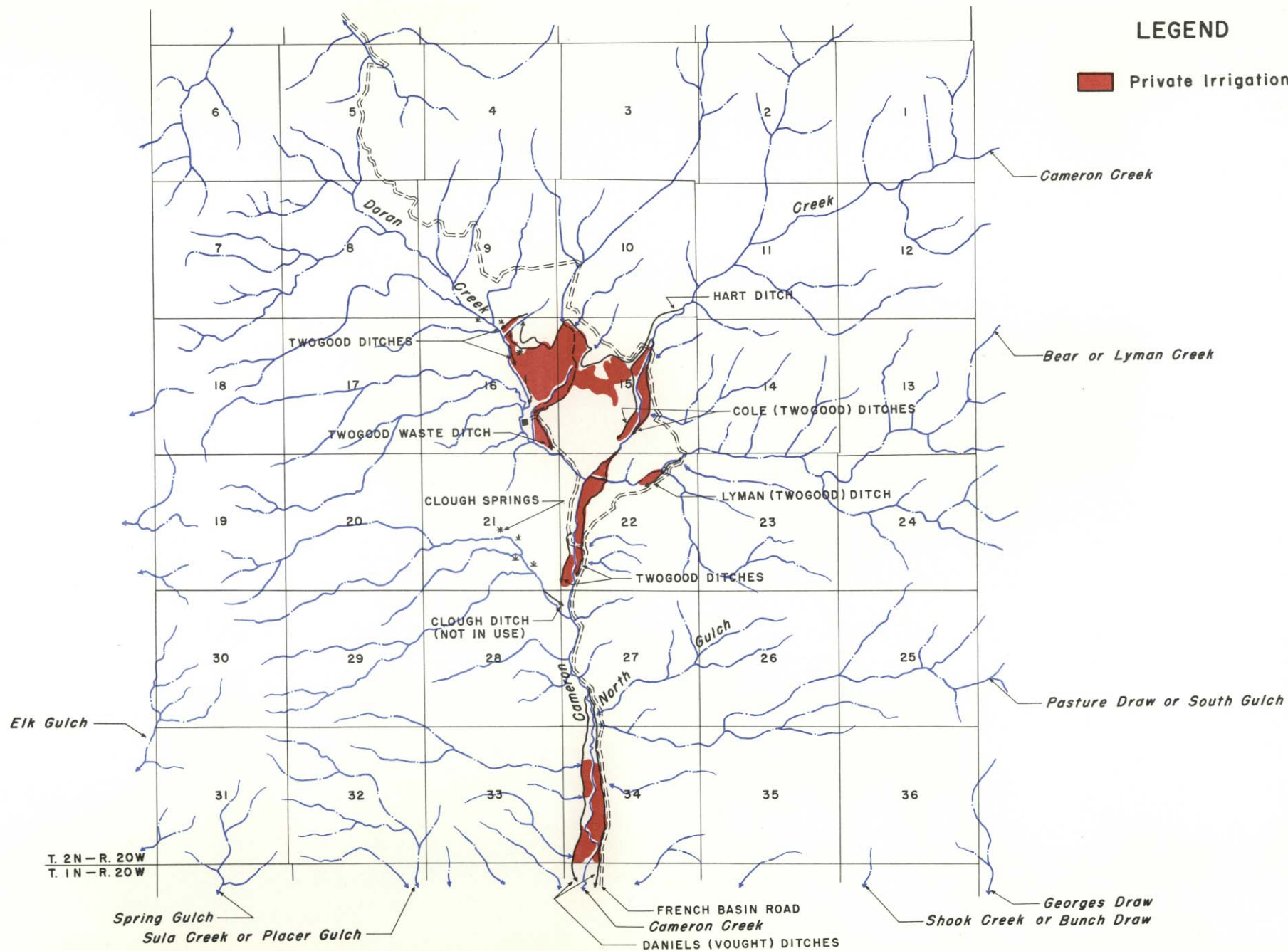
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 Private Irrigation



LEGEND

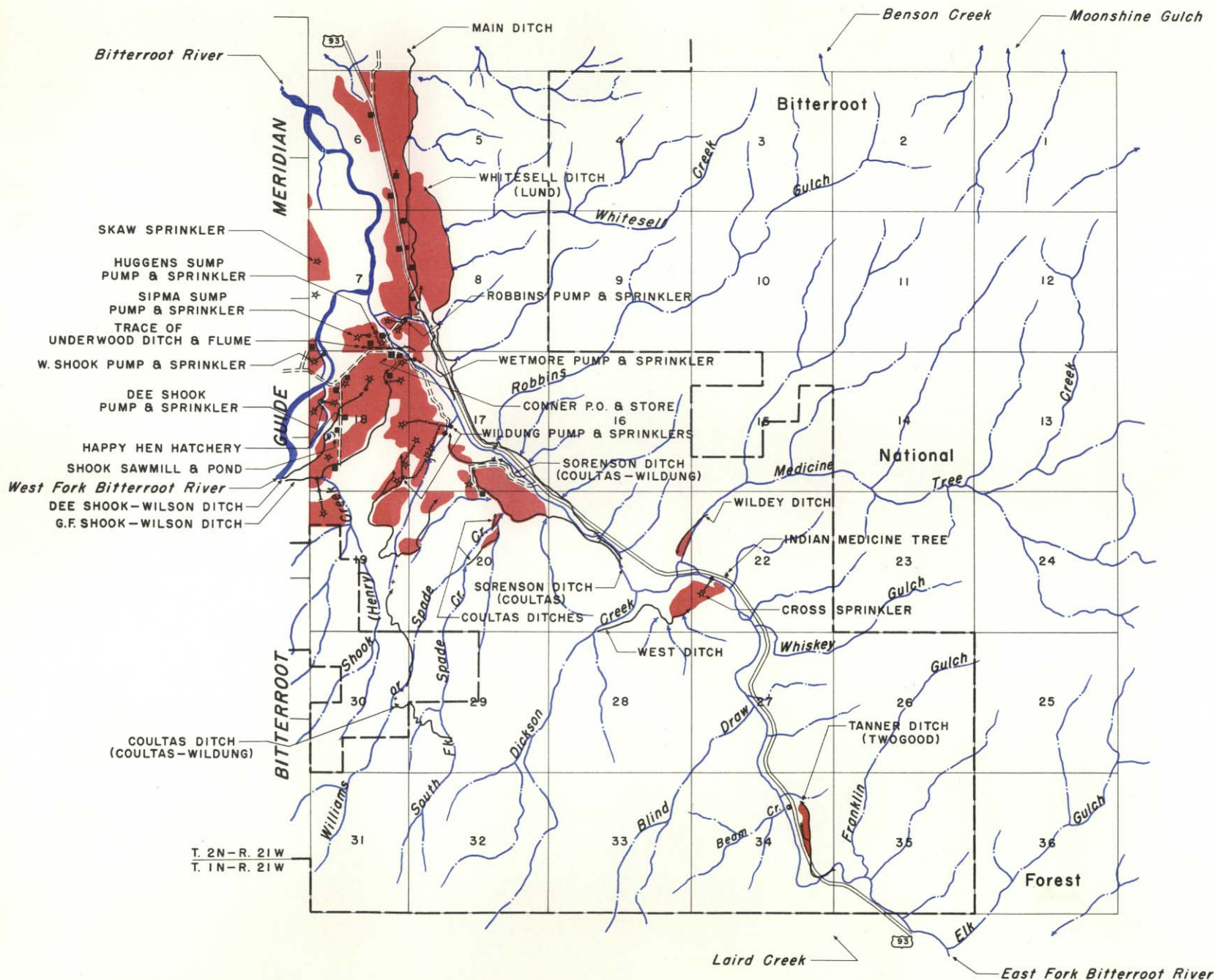
Private Irrigation



Twp. 2 NORTH
Rge. 20 WEST

LEGEND

Private Irrigation



Twp. 2 NORTH
Rge. 21 WEST

LEGEND

Private Irrigation

HANNON (COOPER) DITCH

FOX DITCHES
(KEARNEY)

MEATHREL DITCHES

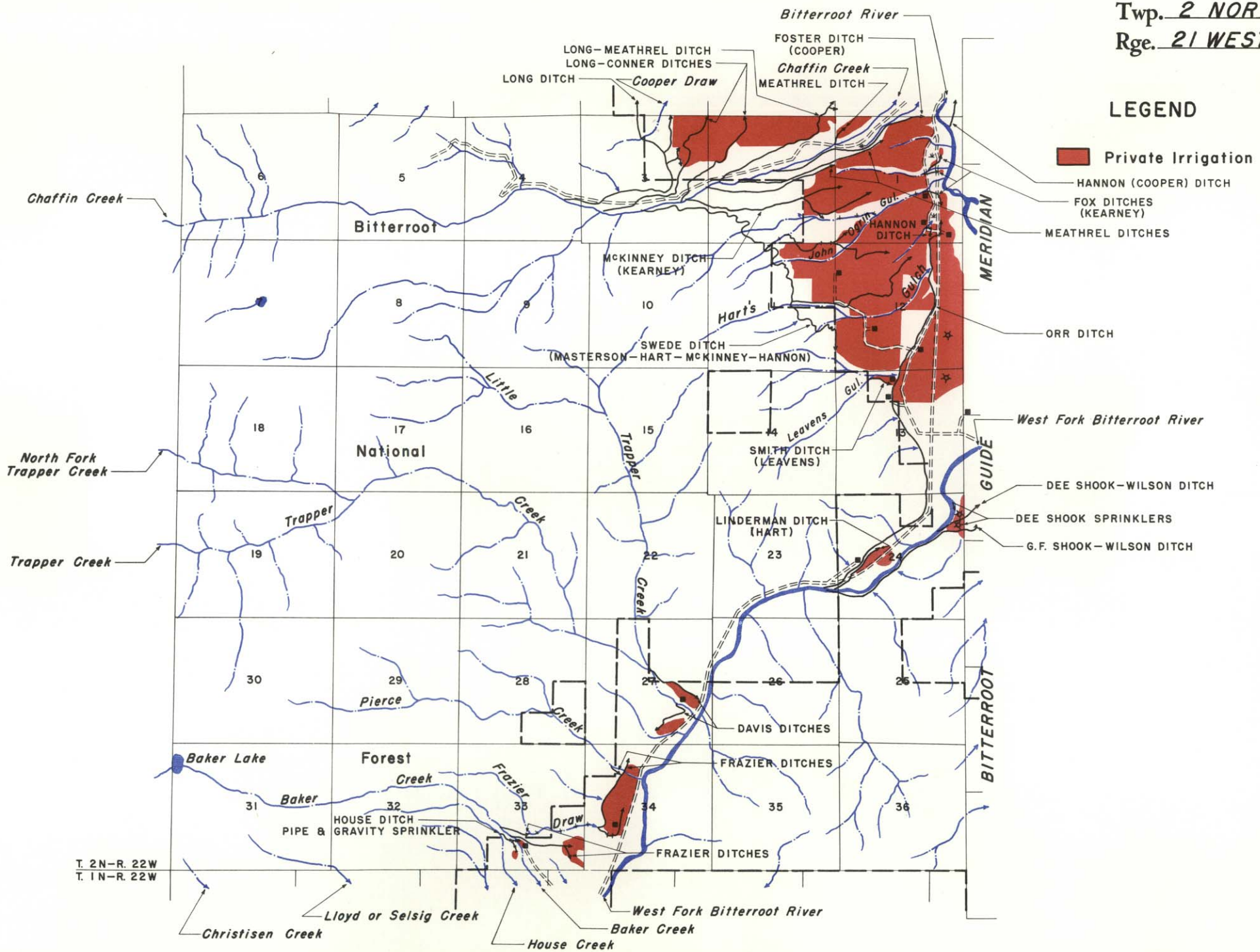
ORR DITCH

West Fork Bitterroot River

DEE SHOOK-WILSON DITCH

DEE SHOOK SPRINKLERS

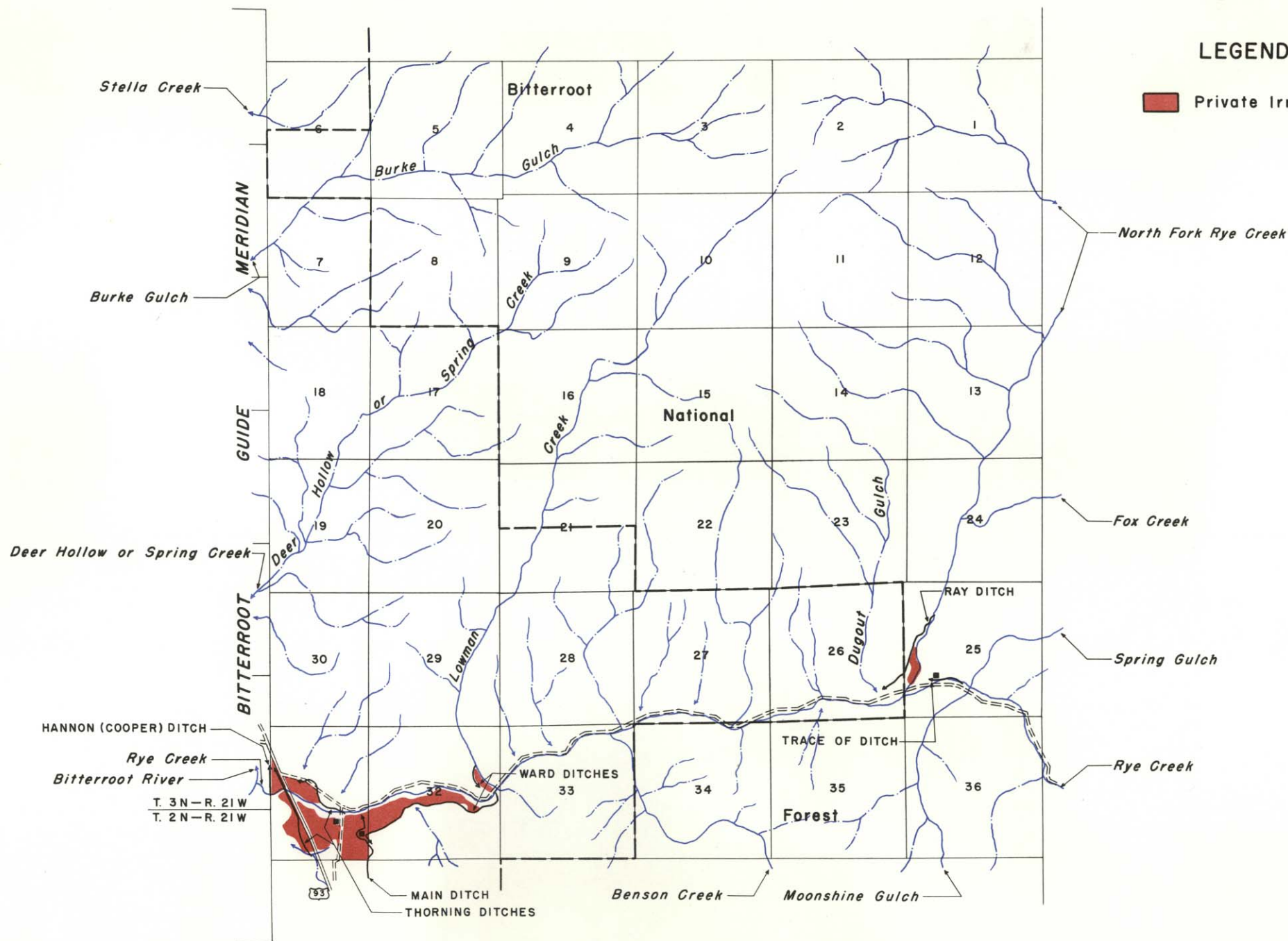
G.F. SHOOK-WILSON DITCH



Twp. 3 NORTH
Rge. 20 WEST

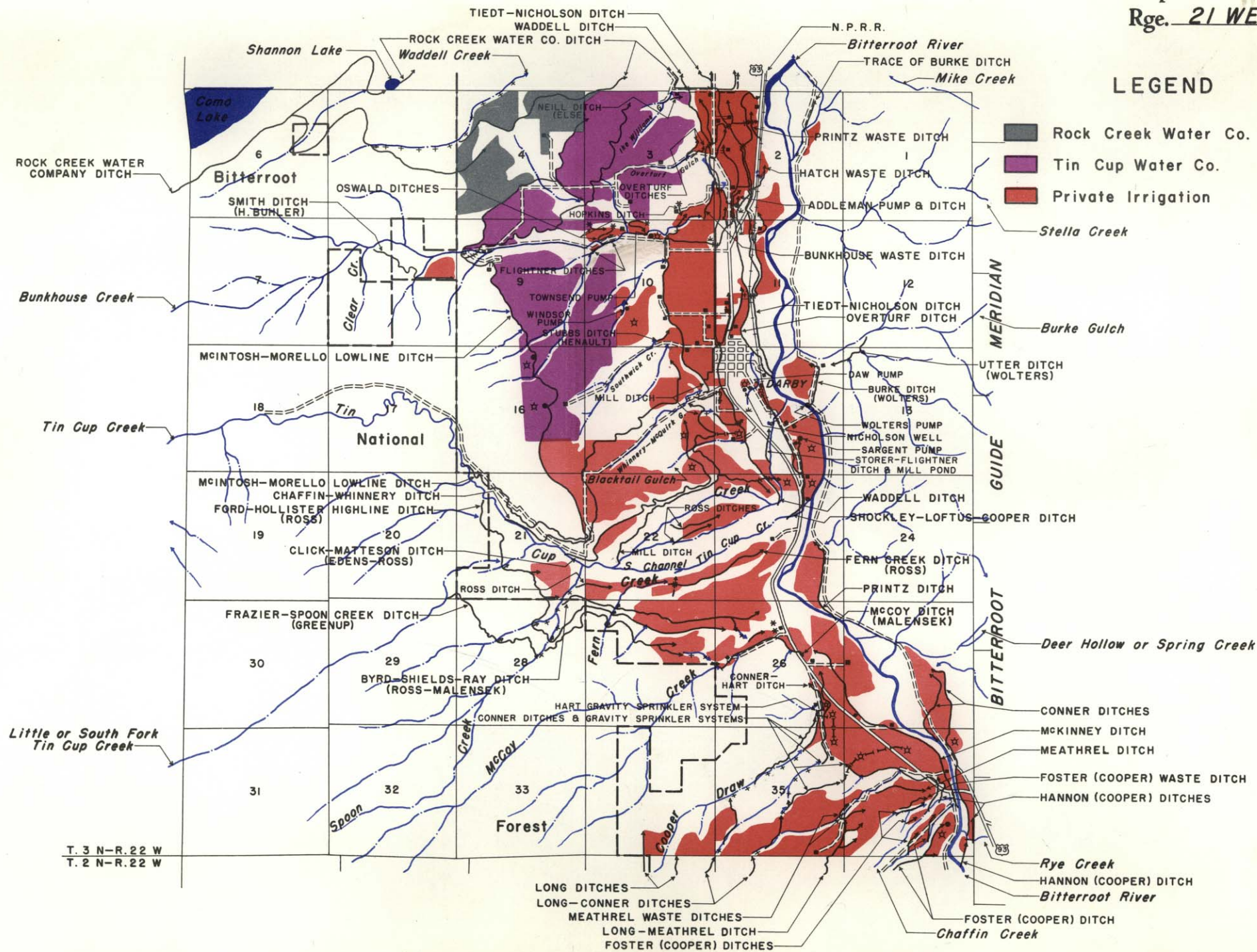
LEGEND

 Private Irrigation



LEGEND

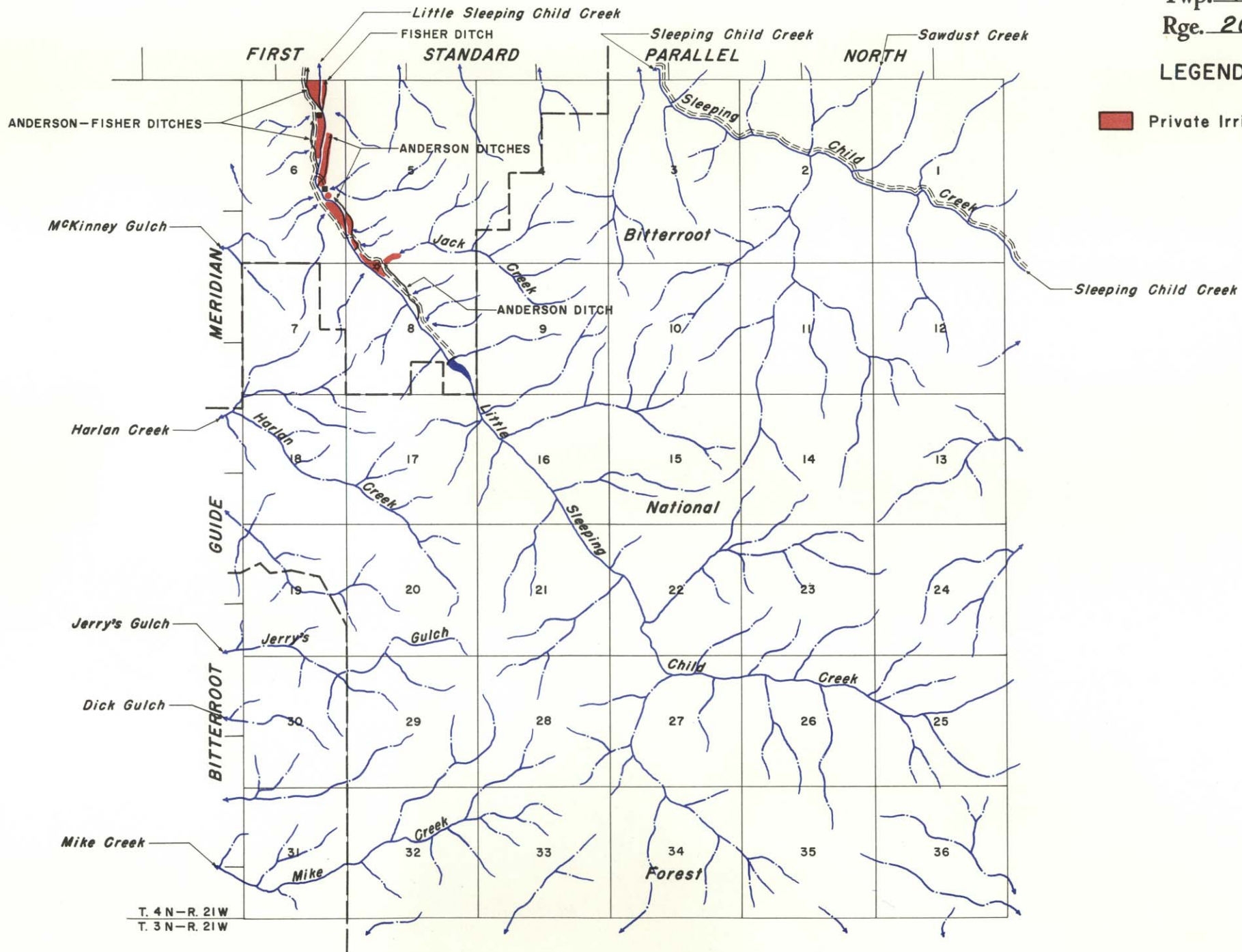
- Rock Creek Water Co.
- Tin Cup Water Co.
- Private Irrigation



Twp. 4 NORTH
Rge. 20 WEST

LEGEND

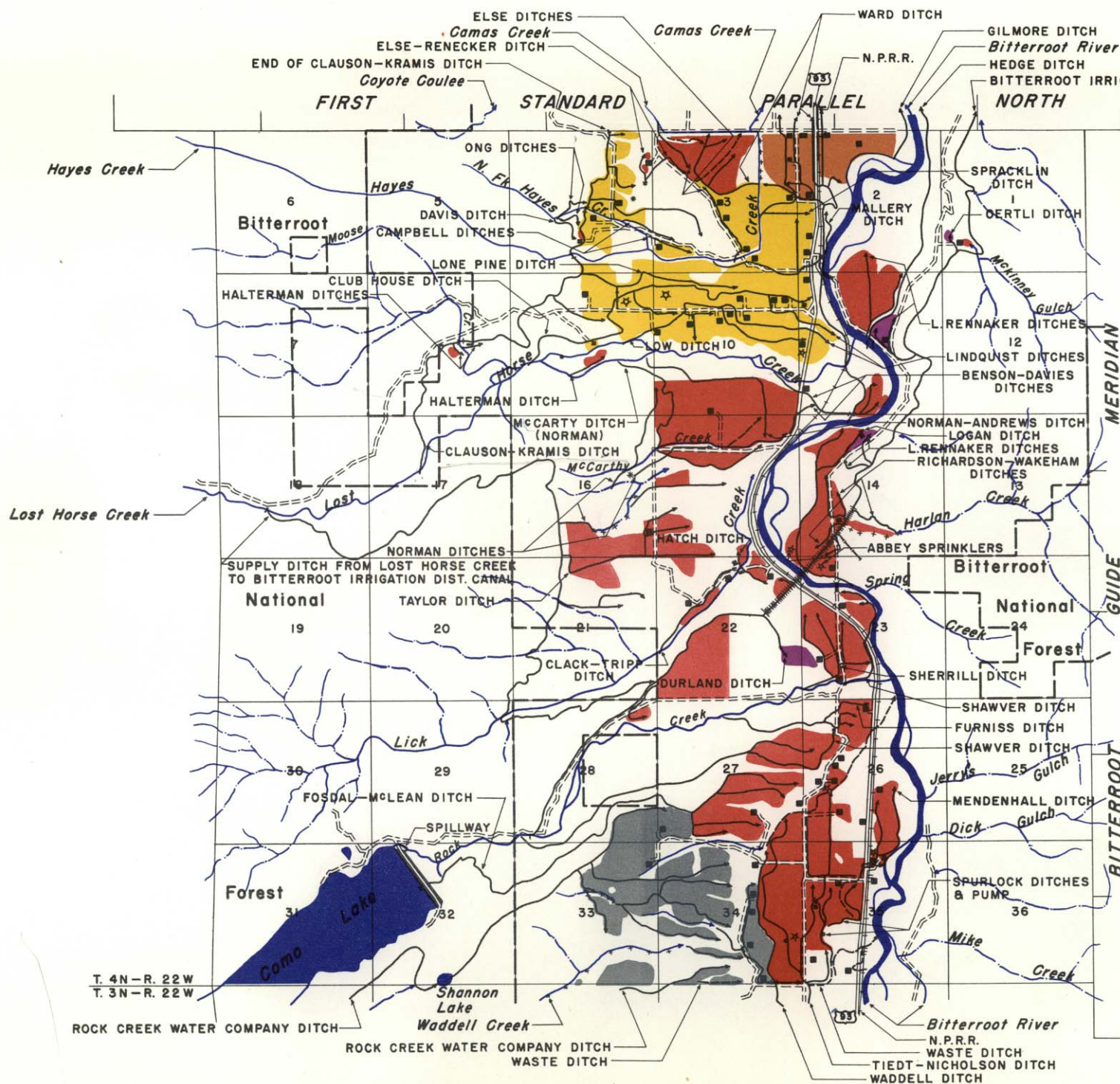
 Private Irrigation



Twp. 4 NORTH
Rge. 21 WEST

LEGEND

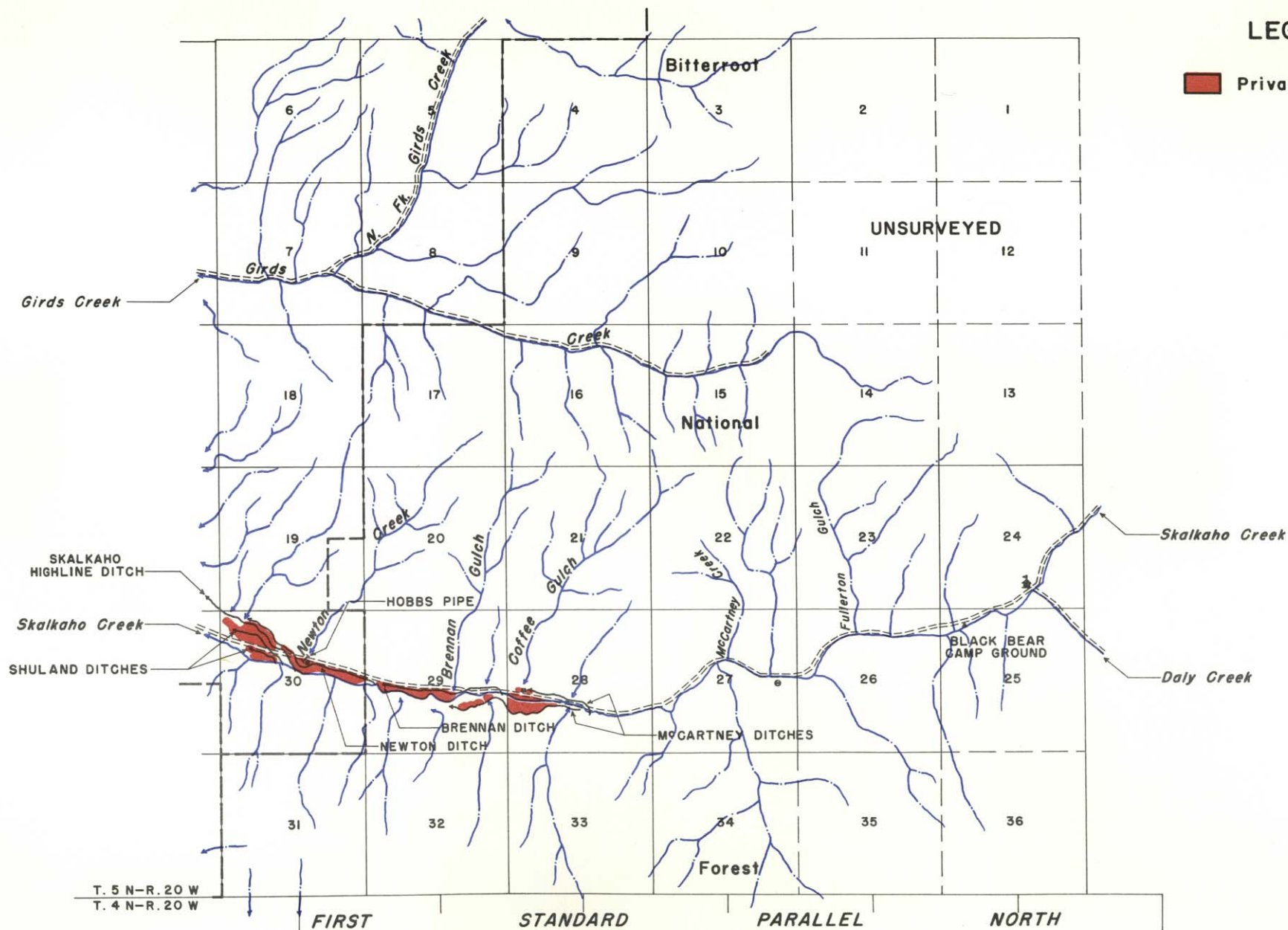
- Bitterroot Irrigation District
- Carlos Irrigation District
- Rock Creek Water Company
- Ward Irrigation District
- Private Irrigation



Twp. 5 NORTH
Rge. 19 WEST

LEGEND

Private Irrigation

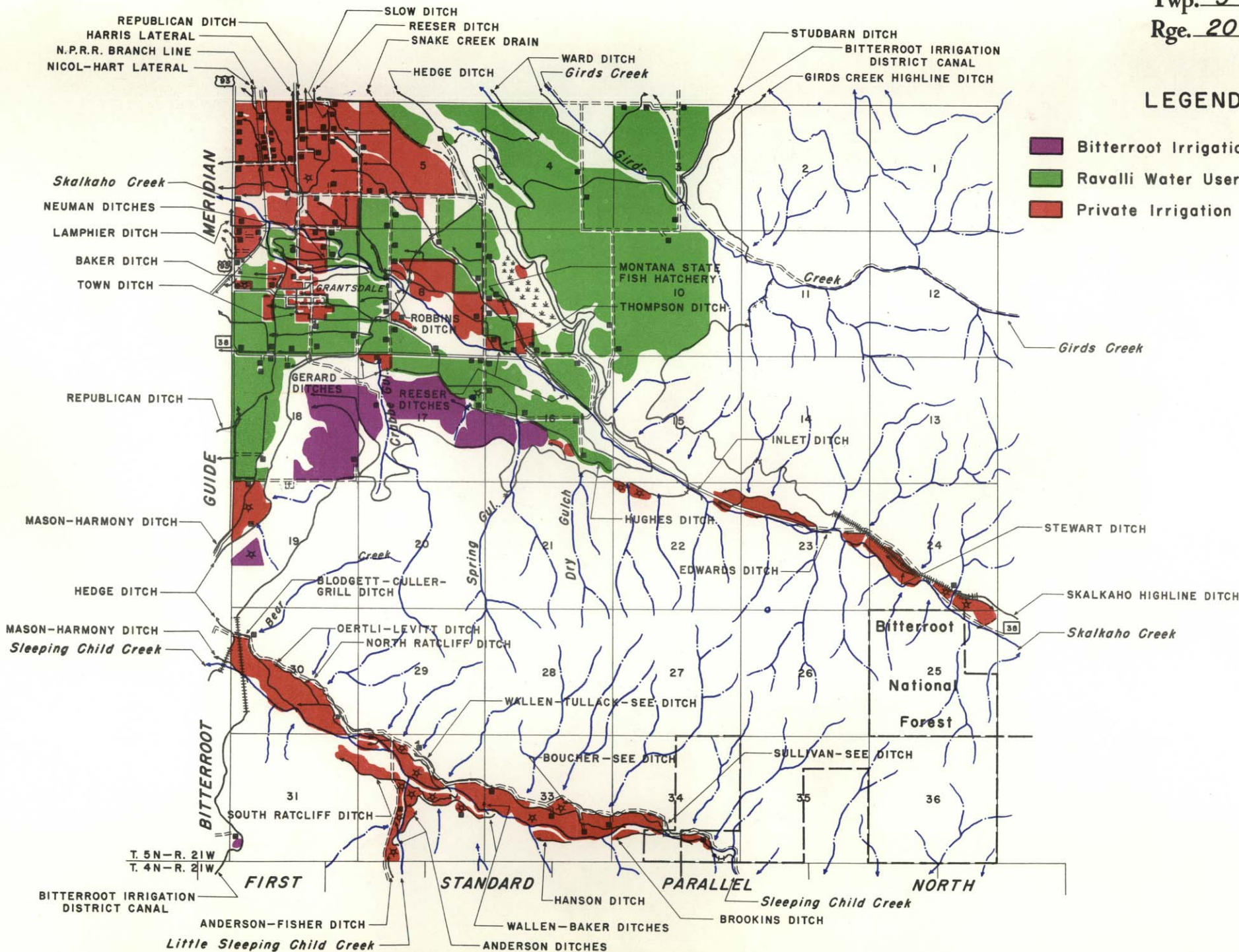


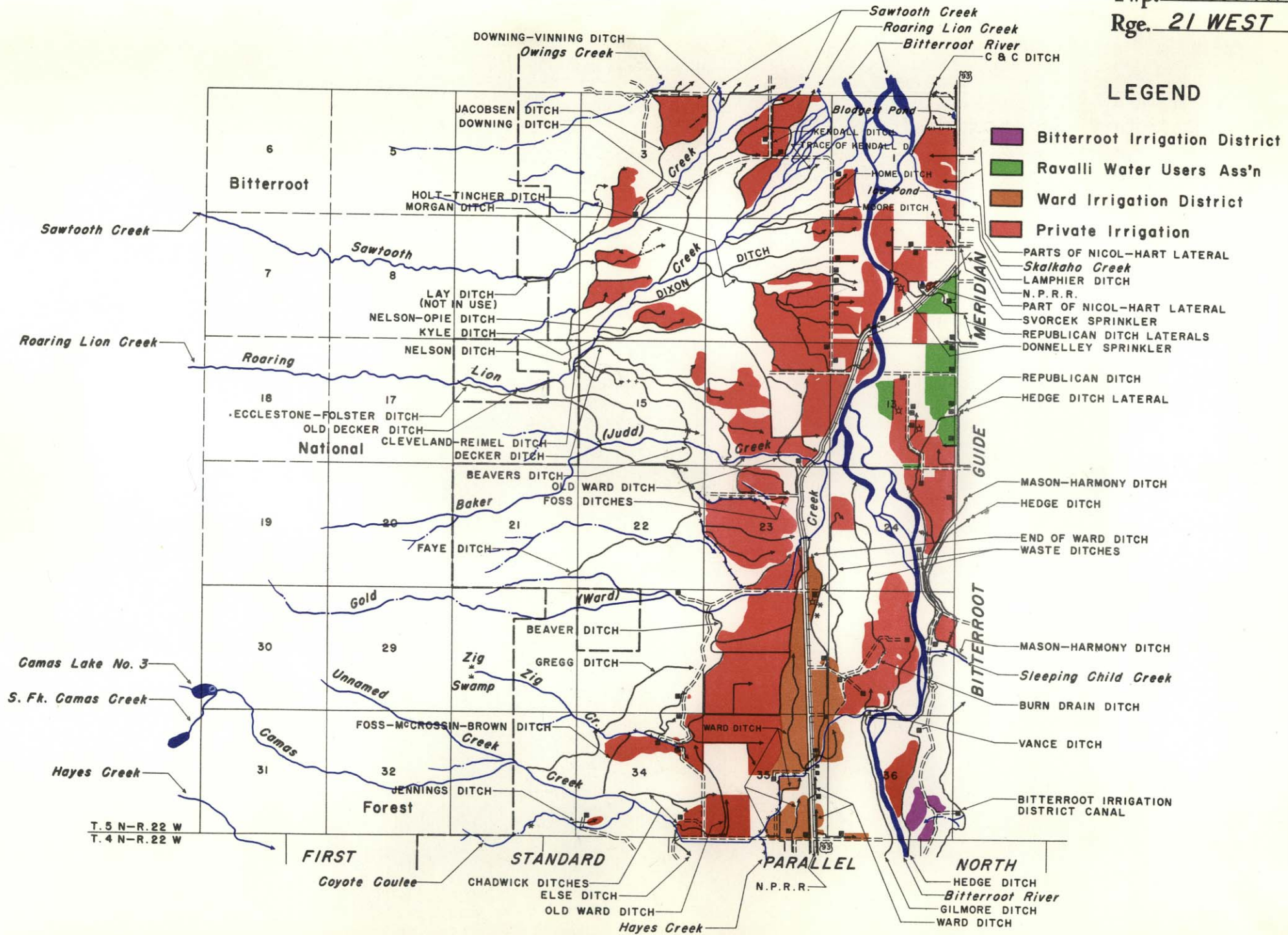
Twp. 5 NORTH

Rge. 20 WEST

LEGEND

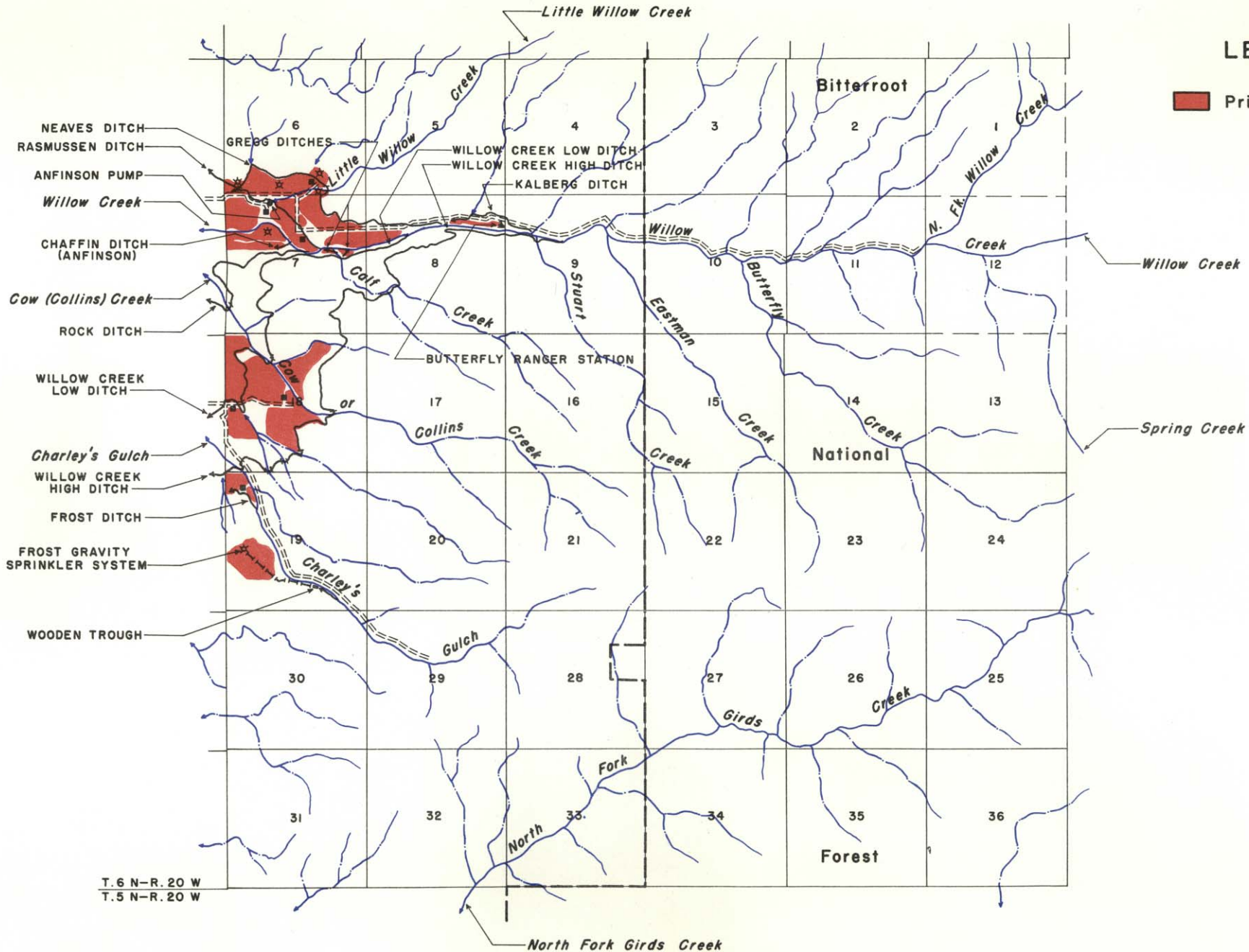
- Bitterroot Irrigation Dist.
- Ravalli Water Users Ass'n
- Private Irrigation





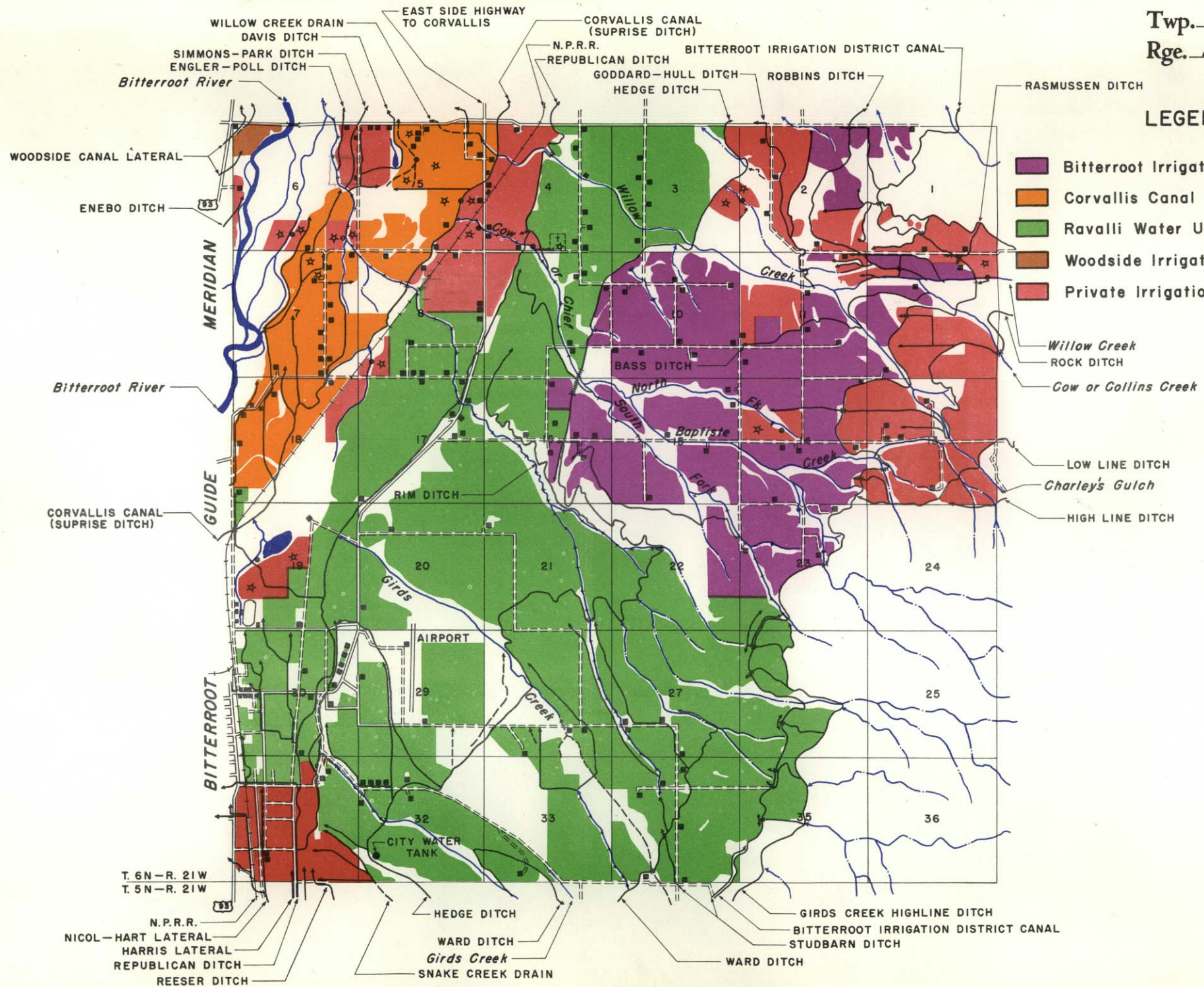
LEGEND

Private Irrigation



LEGEND

- Bitterroot Irrigation District
- Corvallis Canal & Water Co.
- Ravalli Water Users Ass'n.
- Woodside Irrigation Company
- Private Irrigation



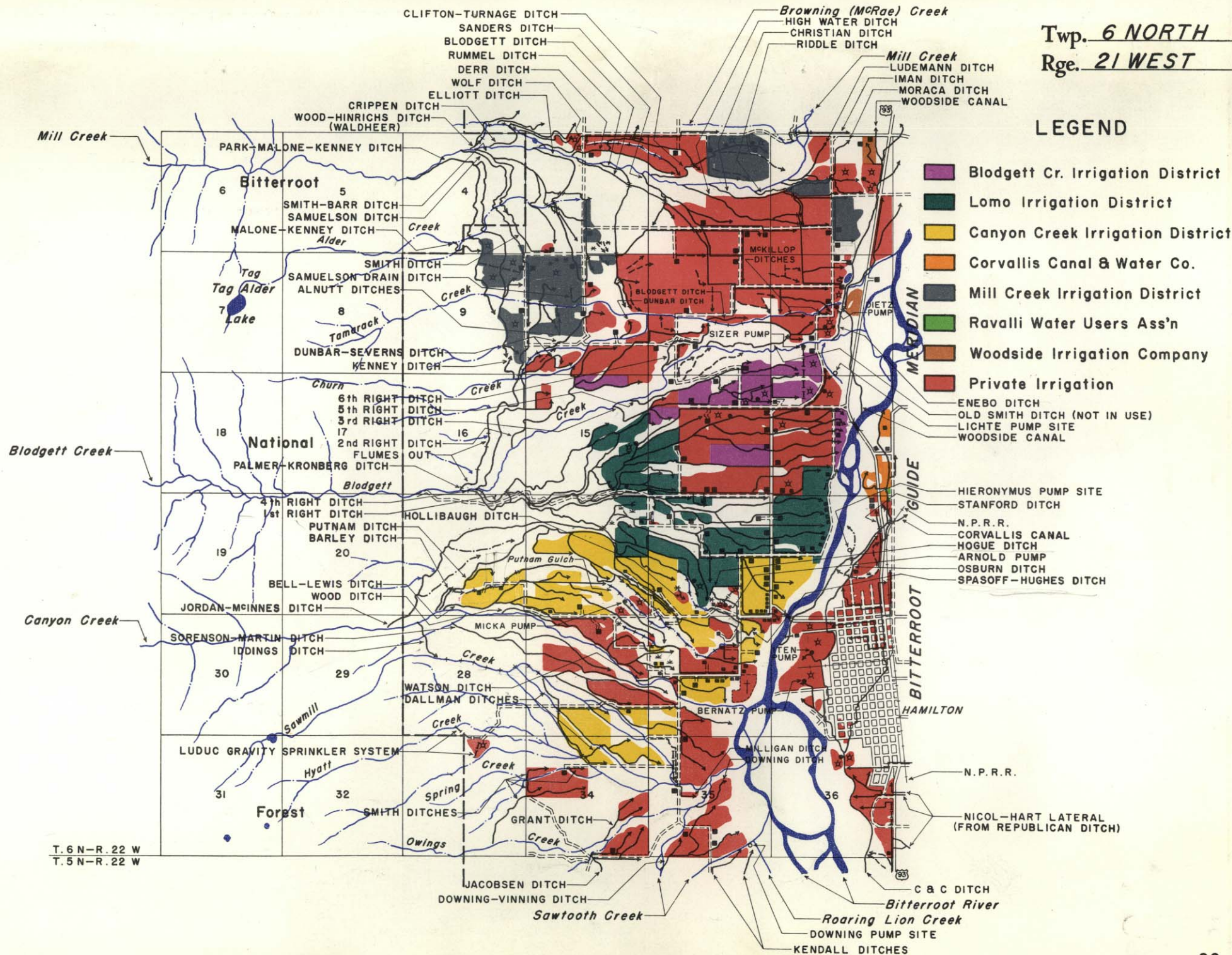
Twp. 6 NORTH
Rge. 21 WEST

LEGEND

- Blodgett Cr. Irrigation District
- Lomo Irrigation District
- Canyon Creek Irrigation District
- Corvallis Canal & Water Co.
- Mill Creek Irrigation District
- Ravalli Water Users Ass'n
- Woodside Irrigation Company
- Private Irrigation

- ENEBO DITCH
- OLD SMITH DITCH (NOT IN USE)
- LICHTE PUMP SITE
- WOODSIDE CANAL

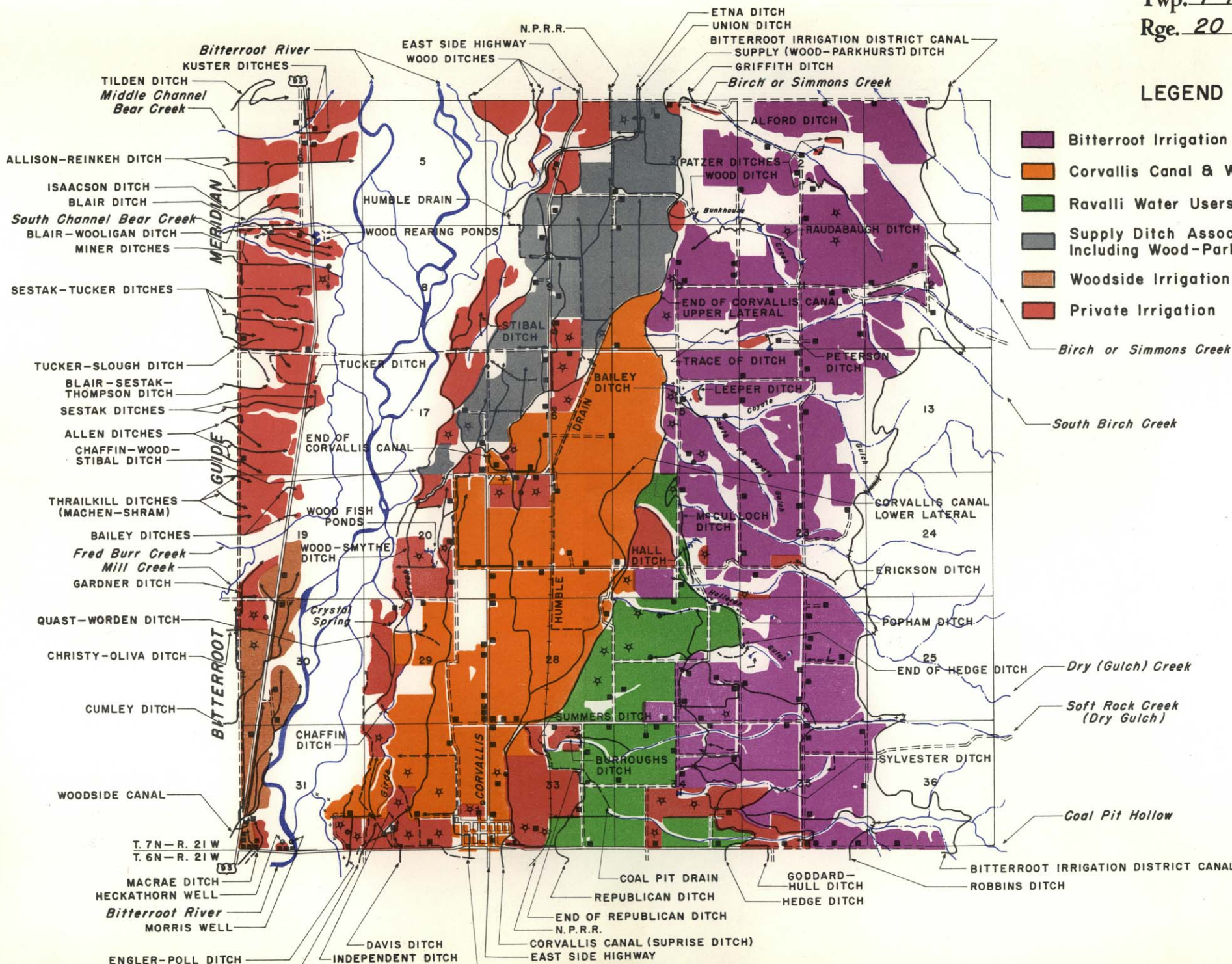
- HIERONYMUS PUMP SITE
- STANFORD DITCH
- N.P.R.R.
- CORVALLIS CANAL
- HOGUE DITCH
- ARNOLD PUMP
- OSBURN DITCH
- SPASOFF-HUGHES DITCH



T. 6 N-R. 22 W
T. 5 N-R. 22 W

LEGEND

- Bitterroot Irrigation District
- Corvallis Canal & Water Co.
- Ravalli Water Users Ass'n.
- Supply Ditch Association Including Wood-Parkhurst
- Woodside Irrigation Company
- Private Irrigation



Twp. 7 NORTH

Rge. 21 WEST

LEGEND

- Fred Burr Cr. W.U.A. & Private
- Mill Creek Irrigation District
- Woodside Irrigation Co.
- Private Irrigation

ALLISON-REINKEL DITCH
South Channel Bear Creek
MINER DITCHES
ISAACSON DITCH
KATTELUS DITCH

MAKI-DWYER DITCH

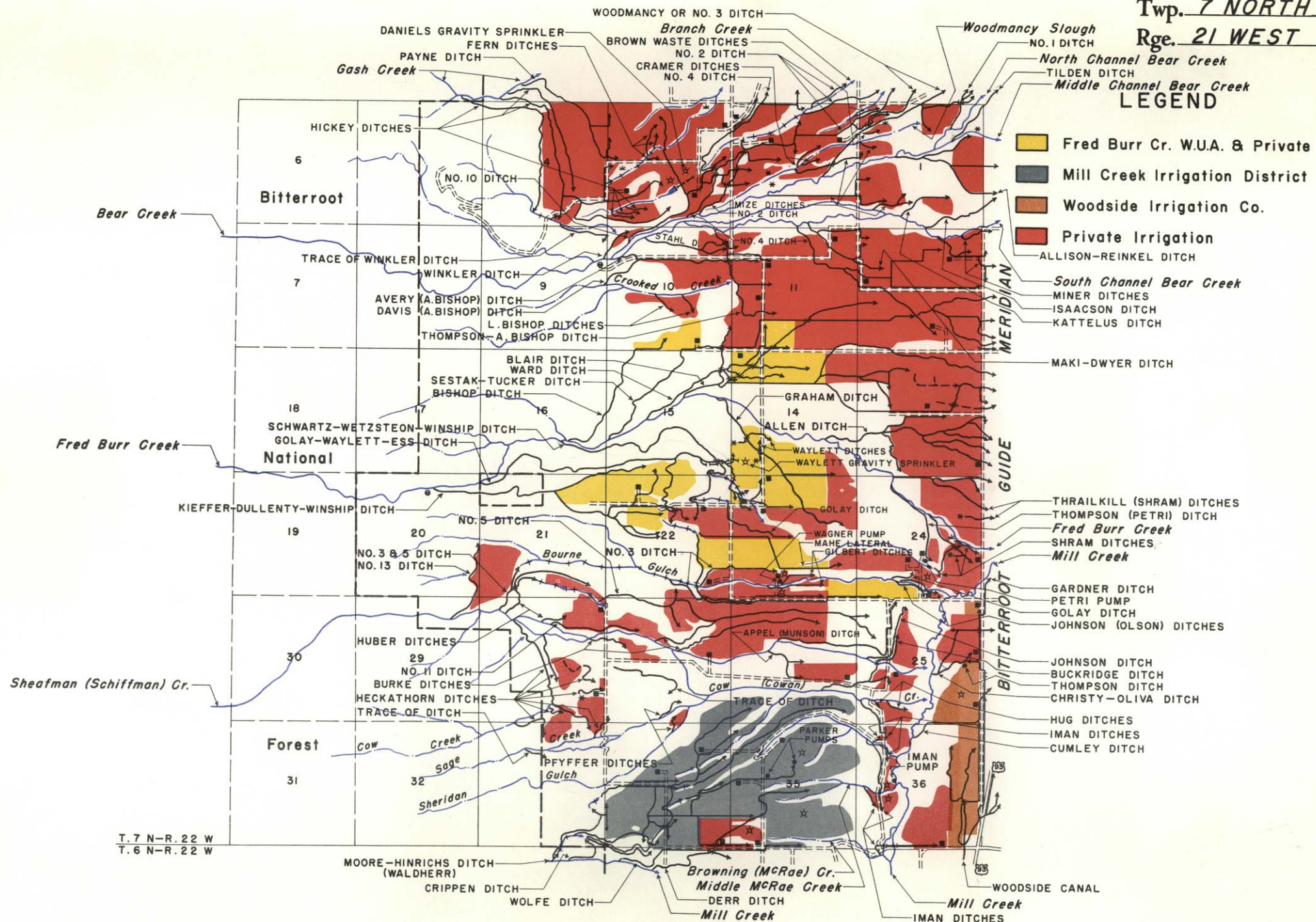
THRAILKILL (SHRAM) DITCHES
THOMPSON (PETRI) DITCH
Fred Burr Creek
SHRAM DITCHES
Mill Creek

GARDNER DITCH
PETRI PUMP
GOLAY DITCH
JOHNSON (OLSON) DITCHES

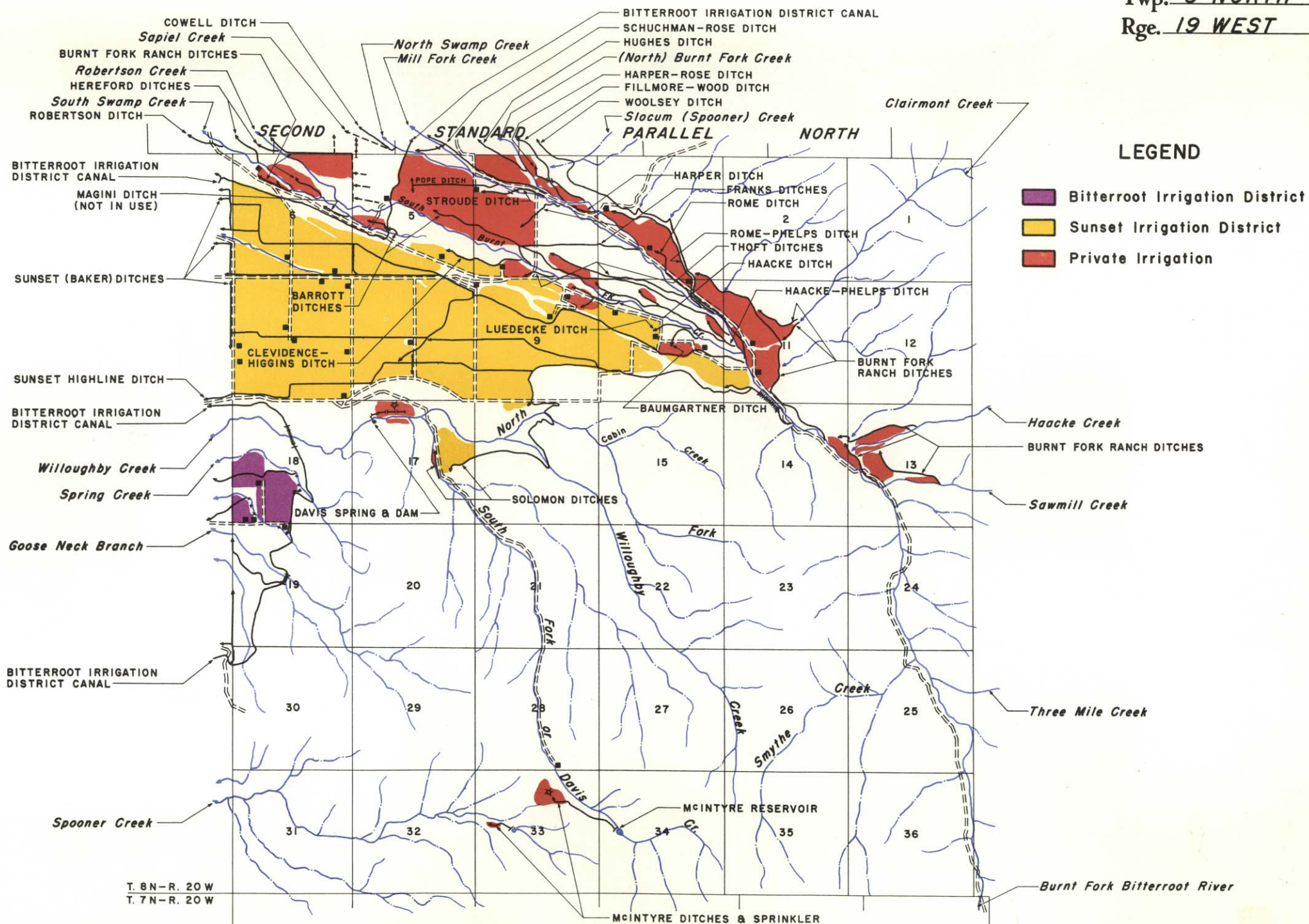
JOHNSON DITCH
BUCKRIDGE DITCH
THOMPSON DITCH
CHRISTY-OLIVA DITCH

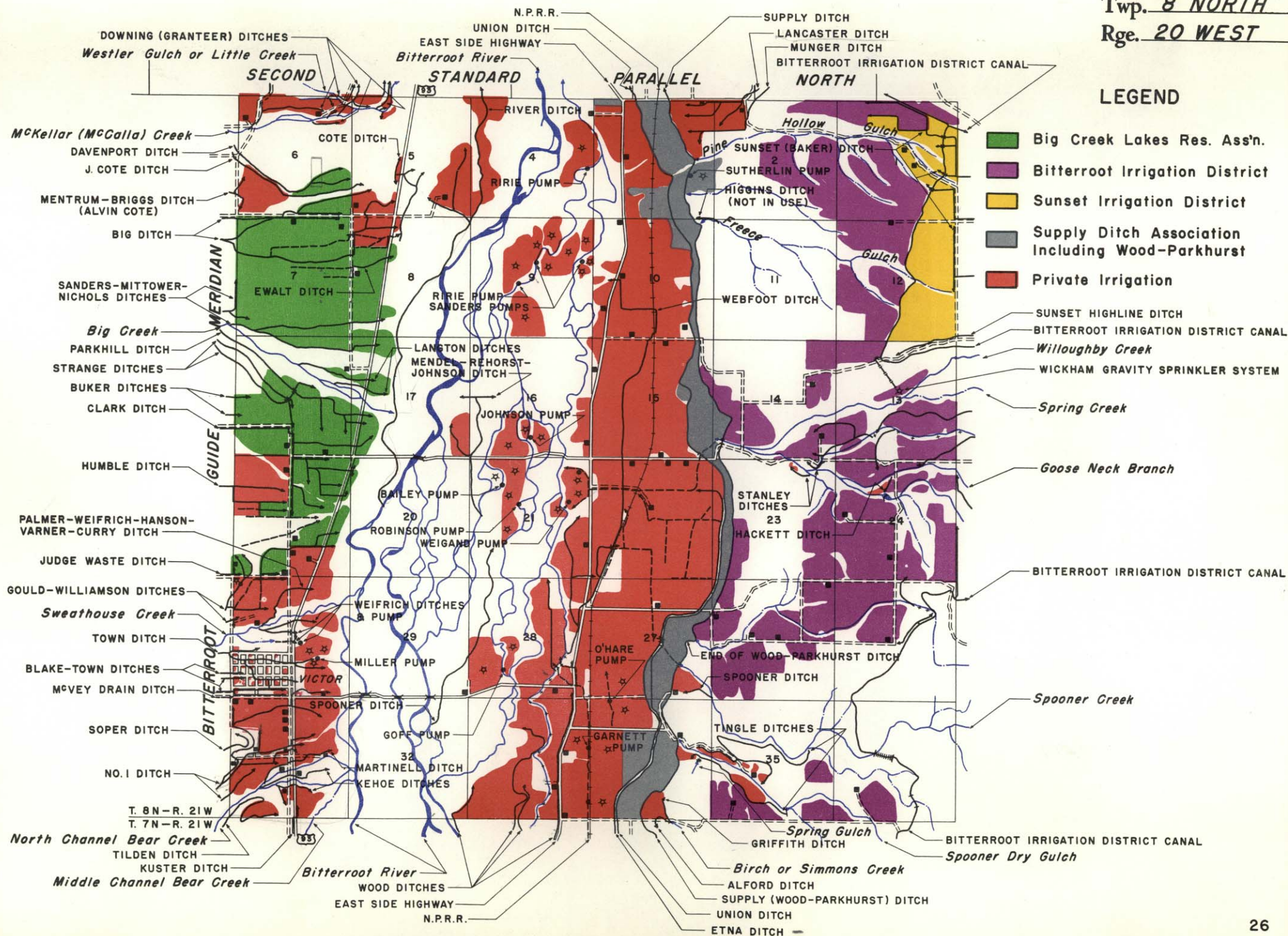
HUG DITCHES
IMAN DITCHES
CUMLEY DITCH

WOODSIDE CANAL
Mill Creek
IMAN DITCHES



T. 7 N-R. 22 W
T. 6 N-R. 22 W

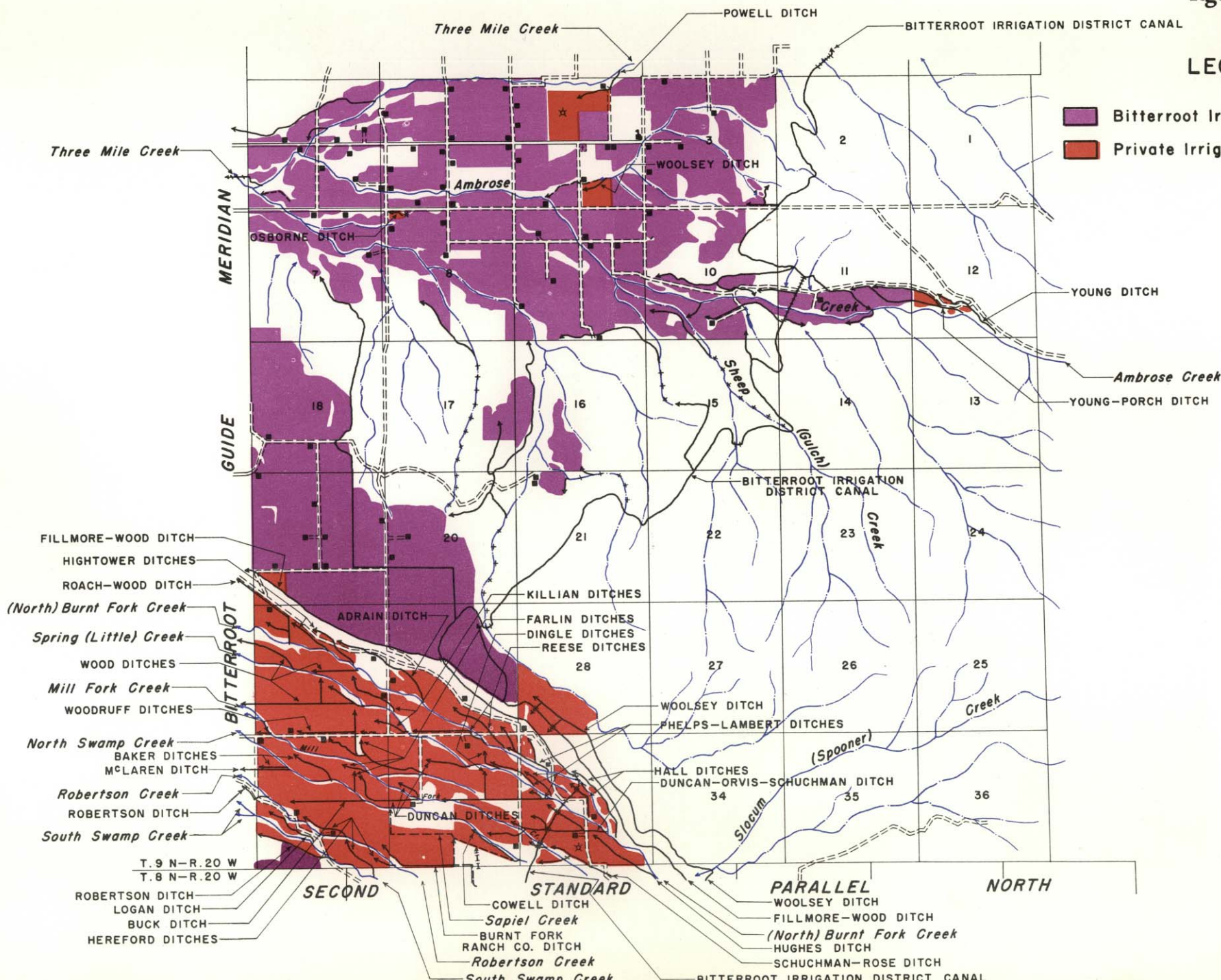






LEGEND

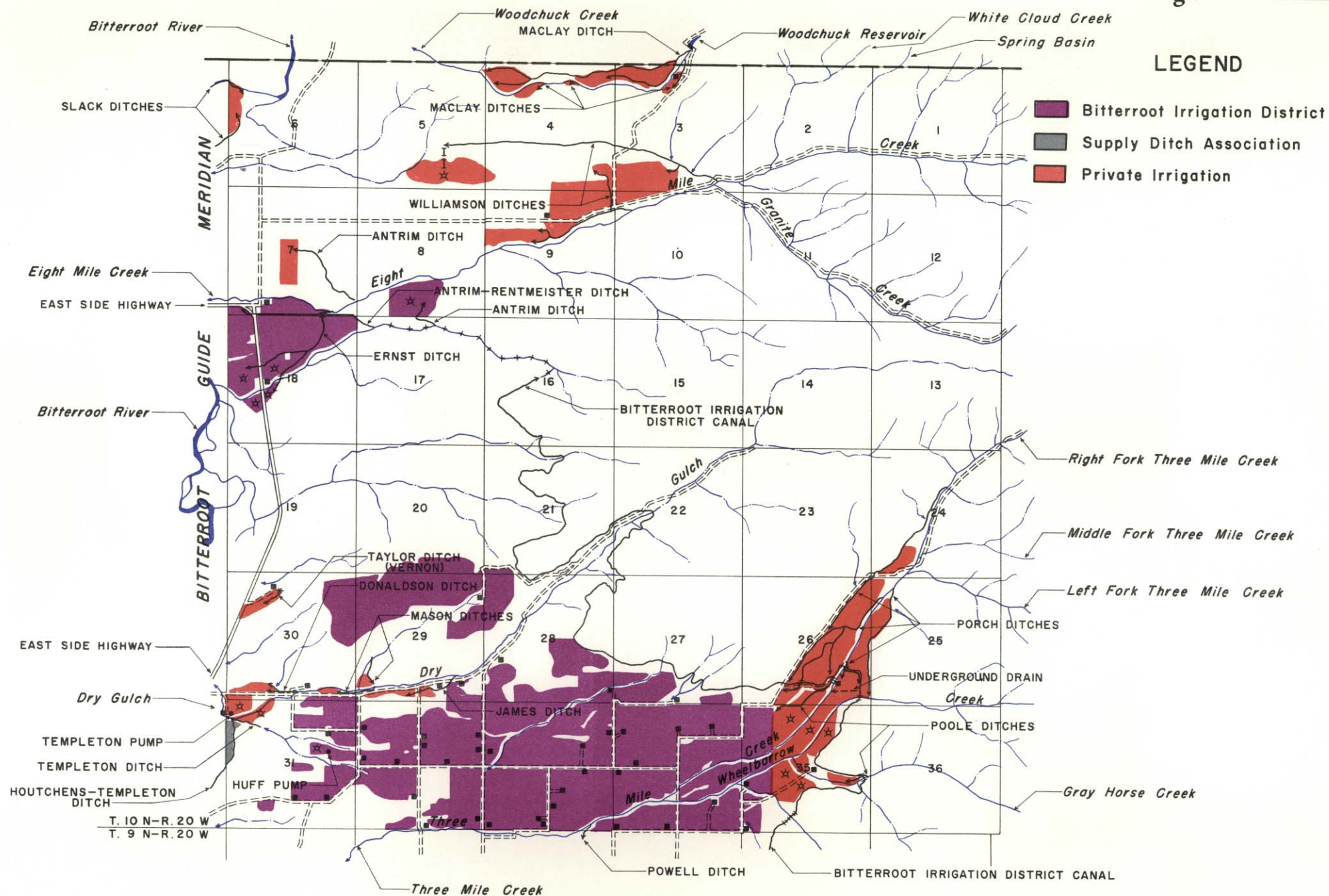
- Bitterroot Irrigation District
- Private Irrigation





COUNTY

LEGEND



MISSOULA

COUNTY

Twp. 10 NORTH

Rge. 20 WEST

LEGEND

- Bass Lake Reservoir Co.
- Bitterroot Irrigation Dist.
- Carlton Creek Irr. Company
- Supply Ditch Association
- Sweeney Cr. Water Users Ass'n
- Private Irrigation

