

PRELIMINARY

ANNING AND CLASSIFICATION REPORT  
OF THE  
PUBLIC DOMAIN LANDS  
IN THE

**LITTLE MISSOURI RIVER  
BASIN**



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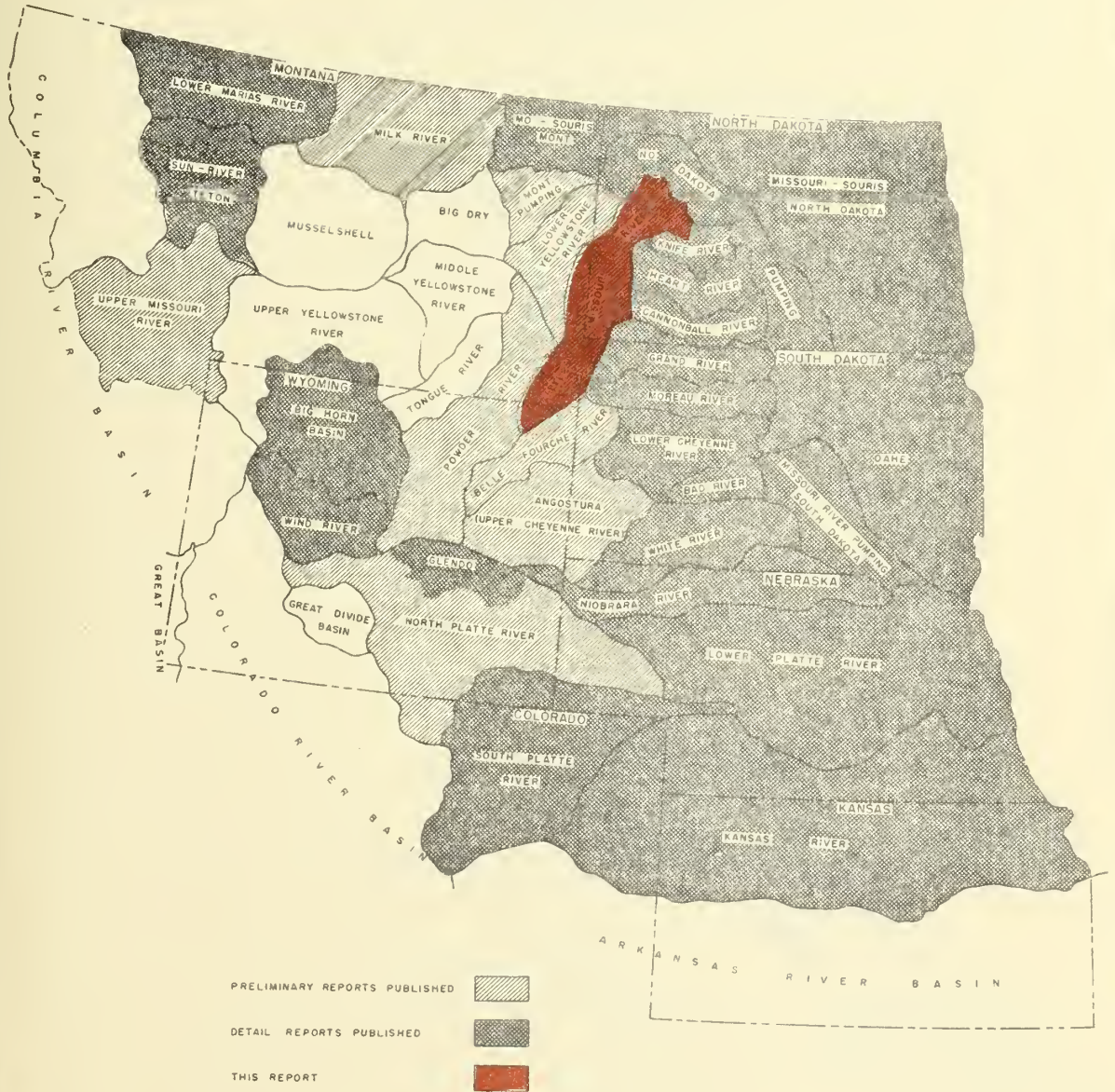
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Preliminary  
Land Planning and Classification Report  
of the  
Public Domain Lands  
in the

LITTLE MISSOURI RIVER BASIN

Montana, Wyoming  
North Dakota, South Dakota

A Missouri River Basin Investigation

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This report was compiled as a feature of the program of the  
Department of the Interior for the development of  
the resources of the Missouri River Basin



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Public Domain Land Within the Little Missouri River Basin -Map Jacket	Jacket
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## PREFACE

This is a report based on a preliminary analysis of the physical and economic factors effecting the land resources in the Little Missouri drainage area in North Dakota, Montana, South Dakota and Wyoming. The location and extent of the public domain lands included in this drainage area is shown on the map accompanying this report, and it is suggested that it be displayed for ready reference while reviewing the report. This study was made as a feature of the Interior Department's comprehensive land and water resource development program for the Missouri River Basin.

The principal sources of information for this report were a field reconnaissance by the Bureau of Land Management and publications of governmental agencies. Ranchers, bankers and other business men of the basin provided additional data pertaining to the study area. Land status was taken from records of the Bureau of Land Management.

The report was prepared by Richard E. Cleveland and Cecil L. Hase, Range Conservationists. District Managers, James Speelman (Montana District II) and Tom Dudley (Montana District III) were consulted during the course of this study and their views have been incorporated in this report. The over all study was under the direction of R. D. Nielson, Regional Chief, Division of Lands, Bureau of Land Management, Region III, Billings, Montana.



## GENERAL DESCRIPTION

### Location and Size

The Little Missouri River Basin lies partially in four states. The headwaters rise in Crook and Campbell Counties, Wyoming; Carter, Fallon and Wibaux Counties, Montana and Butte and Harding Counties, South Dakota. The stream flows northeastward through Bowman, Slope, Billings, McKenzie and Dunn Counties in North Dakota and empties into the Missouri River near Elbowoods, North Dakota. The four state drainage area totals 9,500 square miles. A breakdown by states is shown below:

South Dakota	590 sq. miles
Wyoming	720 sq. miles
Montana	3,440 sq. miles
North Dakota	4,750 sq. miles

The watershed is bounded on the south by the Powder River Basin and the Belle Fourche River Basin, on the west by the Powder River Basin and the Lower Yellowstone River Basin and on the north by the North Dakota Pumping Unit. The eastern boundary is formed by the Knife, Heart, Cannonball, Grand and Moreau River Basins. The length of the drainage is approximately 250 miles and the average width is approximately 48 miles.

### Physiography

The upper reaches of the watershed are characterized by gently rolling prairies and hills of the Great Plains Province. The undulating nature of the topography is broken by buttes and knolls rising as much as 500 feet above the plains. A series of gently sloping terraces form the valley through which the river meanders northeastward. At about the Bowman-Slope County line in North Dakota, the river valley is transformed into a rugged, deeply incised badland formation. This relief extends for several miles on either side of the river channel and becomes increasingly rough as one progresses downstream. In many cases the plain from which this formation was carved gives way sharply and slopes upwards of 45 per cent are common. The badlands, accurately described as "Hell with the fires out" are spectacular, and when viewed for the first time seem fantastic. This erosional phenomenon is being formed through the action of water on poorly cemented sands, clays and siltstones, which are much in evidence throughout the area. Re-

precipitation, in the form of sudden showers, often torrential in nature, produces high runoff which causes rapid cutting on the easily eroded materials. Burning lignite beds have caused cracks in the overburden which invite the erosional action of running water.

The topography of the basin ranges in elevation from 2,000 feet at the confluence of the Little Missouri and the Missouri Rivers to 4,000 feet in the headwaters of the basin. The difference in relief within the badland formation is approximately 450 feet.

The channel gradient of the Little Missouri is about 5 feet per mile and throughout its length the river follows a meandering course. Sandbars, pools and shallow areas are common and may change position from year to year.

Figure 1 illustrates the broad topographic divisions within the basin.

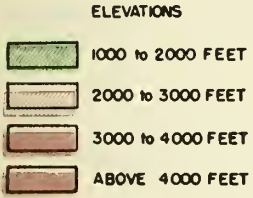
## Geology

The geologic configuration of the Little Missouri drainage area goes back to the upper part of the Cretaceous Epoch of the Mesozoic era. During this period and subsequent periods, the sedimentary beds which characterize the basin were deposited. Igneous rocks are completely lacking in this region and metamorphic rocks are limited to spotty outcrops of clinker. One or more members of the following formations are found throughout the watershed: White River, Fort Union, Lance, Foxhills and Pierre shale. The shales of the Pierre formation and the Hell Creek and Ludlow lignite members of the Lance formation tend to dominate the geology of the basin. The Tongue River member of the Fort Union formation is also prevalent in the drainage area.

The sedimentary rocks consist of thick sheets of shale, sandstone and sandy limestones; also found in quantity are siltstone and lignite. The slates and shales are gray to brown and the sandstones tend to be light yellowish orange to buff and tan.

Clinker, locally called "scoria", is found in many portions of the basin and is commonly used for surfacing secondary roads. This clinker is formed when beds of lignite, found in abundance throughout the watershed, have burned out, baking and fusing the overlying clays, shales and sands.

Petrified trees are found in the region and in many cases



TOPOGRAPHIC DIVISION  
OF THE  
LITTLE MISSOURI RIVER BASIN  
N. DAKOTA, S. DAKOTA, MONTANA, WYOMING

petrification is not complete. The outer rings of stumps are completely solidified while the center is almost charcoal like. Sandstone concretions, which resemble petrified logs, are very numerous. They are, however, of completely inorganic origin. Many fossils have been found in the White River and Arikaree formations near Ekalaka, Montana and have been preserved in the small but complete museum located in this town.

Geologic points of interest in the southern portion of the basin include the Medicine Rocks, which were produced by erosion of the massive sandstone near the base of the Tongue River member of the Fort Union formation. The Chalk Buttes, the Longpine Hills, Bell-tower and the Finger Buttes are prominent land marks in the southern portion of the basin. These features are formed by beds of Arikaree overlying the White River formation. Other land marks of similar origin in the northern portion of the basin include the Killdeer Mountains, Bullion, Saddle and Green River Buttes.

#### Drainage and Water Supply

The Little Missouri River has experienced many changes in its course. The first important change took place at the beginning of the Pleistocene period of the Cenozoic era. At this time the headwaters of the Belle Fourche River pirated the headwaters of the Little Missouri River. This loss of drainage area considerably lessened the flow of the river. The next important change occurred when the outlet of the river was blocked by an advancing ice sheet. This caused the waters of the Missouri, the Yellowstone and the Little Missouri to be diverted south and southeastward across western North Dakota. The elevation of the new mouth, caused by the ice sheet, was considerably lower than the original outlet. This caused rapid downcutting to take place and when coupled with the erodible nature of the soils the ground work for the present day badland formation was laid. 1/

The Little Missouri River today is a typical plains stream with a highly erratic flow. Gaging stations located at Alzada and Wibaux, Montana; Marmarth, Medora and Watford City, North Dakota, sample and measure the discharge of the river. While the data obtained from these stations is periodic, it shows the flow of the river to be highest in the spring months during the snow melt and to be lowest during the winter months when flow almost stops.

1/ Laird, Wilson M., The Geology of the South Unit Theodore Roosevelt National Memorial Park: State Historical Society of North Dakota, Reprint from Vol. 17, No. 4, Oct. 1950, p. 9.

The flow, measured in second feet, has been recorded as low as 1.1 and as high as 17,700.

The Bureau of Reclamation has made several reconnaissance studies of the river basin and has located several sites for flood control and irrigation reservoirs. The most feasible of these sites is in the vicinity of Alzada, Montana. Little further work has been done on these projects due to the small amount of irrigable land and insufficient water supply.

The major tributaries of the Little Missouri are Thompson, Box Elder, Little Beaver, Beaver and Cherry Creeks. Minor tributaries of the drainage system include Prairie, North Fork, Valley, Deep, Magpie, and Charlie Bob Creeks. Beaver Creek is the largest of the principal tributaries and enters the river in North Dakota at a point near the McKenzie-Billings County line. Box Elder is the second largest tributary and enters the river near Concord, North Dakota.

## Climate

The climatic setting of the basin is within the largest uninterrupted area with a semi-arid climate in North America. Typical of this climate are hot, dry summers and long, cold winters. About half of the precipitation comes in an erratic pattern, as rain during the months of April, May, June and July. The remaining precipitation comes as snow or rain mostly in the winter months. During the summer months, rains of torrential nature and short duration are common and are frequently accompanied by localized hailstorms. Blizzards of several days duration are common in the winters.

Temperatures have been reported as low as 57 degrees below zero and as high as 114 degrees above zero in the basin. The frost free period varies from 111 days to 139 days. Some slight trend toward a shorter frost free period is noted as one progresses northward from the headwaters of the drainage to its mouth.

Average annual precipitation varies from 13.17 inches in Carter County, Montana, to 16.02 inches in Billings County, North Dakota.

This type of climate is particularly hazardous to the sustained production of cultivated crops. Yields may be high in the relatively favorable years and nil in the years of low precipitation. There has

evolved in this area an agricultural operation which combines stock raising and dry farming in a manner which is particularly adapted to the climatic and soil conditions of the region. However, the prolonged winters with heavy snows and blizzards make a large reserve feed supply necessary for livestock and the frequent hailstorms may do heavy damage to the range and planted crops in the summer.

## Soils

The soils of the watershed are of the northern dark brown great soil group and are, for the most part, immature and poorly developed. Soils of the headwaters of the drainage are dominated by the shales of the Pierre formation and are shallow to very shallow in depth, heavy in texture with slow permeability. The density, high colloidal characteristic and the weathering tendency of the subsoil and parent material make these soils very susceptible to the erosive action of running water.

Throughout the basin, soils developed over sandstone are interspersed with the clay soils. These soils, developed over the Fort Union and the Fox Hills formations, are much in evidence on the benches of the lower reaches of the watershed. Soils of this origin are deep and friable and most of the cultivation done in the area takes place on them. The Morton silt loam and the Williams loam are the best examples.

Soils of the river bottom are deep and loamy, usually developed over old alluvial or colluvial material. These soils are excellent for cultivation, but are usually so located as to preclude or limit such use. Where cultivation is possible very desirable results are obtained.

The badlands, which cover a large portion of the basin, present a varied pattern of minute soil types. The types range from tiny terraces, developed over old alluvium, to very shallow soils with undifferentiated texture and unconsolidated underlying material. Seldom, if ever, is any use other than grazing made of this area. Erosion is severe with the action of running water being the principal agent.

## Vegetation

The vegetative cover of the basin is divided roughly into five basic types; shortgrass, sage, woodland, forest and tallgrass. The shortgrass type dominates the drainage area, covering approx-



imately 66 per cent of the watershed. This association extends from the mouth of the river to the Montana-Wyoming state line where it becomes a finger like projection into the sage type. The principal components of this type are needleandthread (*Stipa comata*), bluestem wheatgrass (*Agropyron smithi*) and the dryland sedges (*Carex* spp.). Other members of this association, also found in quantity, are blue grama (*Bouteloua gracilis*), prairie junegrass (*Koeleria cristata*), little bluestem (*Andropogon scoparius*), Sandberg bluegrass (*Poa secunda*), prairie sandreedgrass (*Calamovilfa longifolia*) and alkali sacaton (*Sporobolus airoides*). The shortgrass type covers the badlands area but here, while the basic cover is still shortgrass, many variations are to be found. Saltbush (*Atriplex* spp.), big sage (*Artemesia tridentata*) and juniper (*Juniperus scopulorum* and *horizontalis*) become important associates. Other woody plants of the badlands include sumac (*Rhus* spp.), chokecherry (*Prunus demissa*), wolfberry (*Symphoricarpos occidentalis*), wild plum (*Prunus Americana*) and buffaloberry (*Synsperdia* spp.), yucca and cactus. Herbaceous plants of the association are, pasque flower (*Pulsatilla* spp.), larkspur (*Delphinium* spp.), arnica (*Arnica* spp.), cow parsnip (*Heracleum lanatum*), sunflower (*Helianthus* spp.), golden rod (*Solidago* spp.), aster (*Aster* spp.) and phlox.

The sage type, which covers approximately 20 per cent of the drainage area, is located on the heavier soils of the headwaters of the basin. Here, big sagebrush is associated with bluestem wheatgrass, blue grama, cactus and annual weeds. On the uplands of this type, some buffalograss (*Buchloe dactyloides*) is found. On the more stabilized of these soils, bluestem wheatgrass is quite conspicuous. Within the basic sage type small micro-types of saltbush occur on the most poorly developed soils, on the lighter soils, usually rolling hills, small shortgrass types appear and are basically similar to the large shortgrass type of the northern portion of the drainage.

Ten per cent of the watershed is covered with a woodland type. This vegetal division is located along the river bottom, as well as on lands contiguous to the forested area. The overstory of this type is made up of coniferous and deciduous species. The principal components are chokecherry, wild plum, buffaloberry, aspen (*Populus tremuloides*), willow (*Salix* spp.), juniper, cottonwood (*Populus deltoides*), ash (*Fraxinus lanceolata*) and elm (*Ulmus fulva*). Scattered ponderosa pine trees (*Pinus ponderosa*) complete the aspect. The shortgrass type with a sprinkling of mid-grasses make up the understory. New species added to the shortgrass type are bluebunch wheatgrass (*Agropyron spicatum*) and pinegrass (*Calamogrostis rubescens*).

Approximately 3 per cent of the basin is forested. This type lies in Carter County, Montana, Crook County, Wyoming, and Harding County, South Dakota. A small amount of this type is also found in North Dakota. The type is characterized by open stands of Ponderosa pine frequently broken by rimrocks and grassy mesas. Most of the area is a poor growing site, but intermingled with the poor sites are better sites growing trees of larger size and fair quality. Because of the semi-arid climatic conditions the people living near these forests have a deep appreciation of the trees that is so frequently lacking in extensively forested areas.

A small area, less than 1 per cent of the watershed, supports a cover of tall grass prairie. This post climax relict is located on the extreme eastern flank of the basin in Harding County, South Dakota. Among the very numerous species of grasses which are components of this association, the most important are the bluestems (*Andropogon* spp.), tall panic grass (*Panicum virgatum*), tall marsh grass (*Spartina michauxiana*), giant wild rye (*Elymus canadensis*) and the needlegrass (*Stipa* spp.). Figure 2 is a small scale map showing the broad vegetal divisions of the basin.

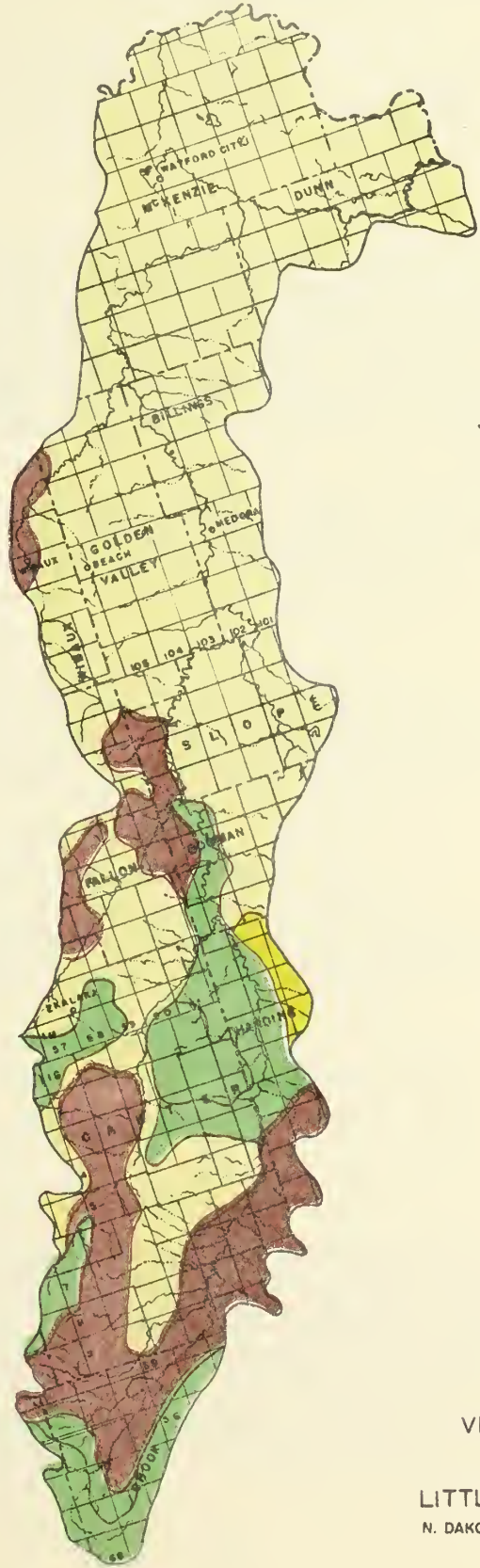
## Agriculture

Livestock ranching is the dominant type of agriculture practiced within the watershed. The southern portion of the basin is almost exclusively devoted to this type of operation. Both cattle and sheep ranches are found but cattle seem to be the class of livestock preferred by a greater number of stockmen. Some dry farming is done in conjunction with the average stock-raising enterprise but in many cases the grain raised is used for winter feed to supplement winter grazing and hay supplies. In the northern portion of the basin more of a combination operation has developed. Here, on the average operation, about 50 per cent of the income is derived from the sale of livestock and about 50 per cent from the sale of small grains. There are, of course, exceptions where either livestock or dry farming is the sole means of livelihood.

Grains raised in the basin include, wheat, oats, barley, corn and flax. Alfalfa is sometimes raised for seed but it is principally a hay crop. Hay is cut largely from native meadows but fields of crested wheatgrass and alfalfa produce many tons of feed annually. There are no large irrigation projects in the drainage area, however, numerous small flood irrigation systems utilize to good advantage the spring runoff.

LEGEND

- Timber
- Woodland
- Sage
- Tall Grass
- Short Grass



VEGATATIVE TYPE MAP  
OF THE  
LITTLE MISSOURI RIVER BASIN  
N. DAKOTA , S. DAKOTA, MONTANA, WYOMING

Livestock numbers in the basin, based on the Agricultural Census of 1951, are as follows:

Cattle	114,600
Sheep	127,600
Horses	9,000

### Forestry

The forested areas of the basin lie, for the most part, in Carter County, Montana. Small portions are found in Crook County, Wyoming, Harding County, South Dakota and on widely scattered sites in North Dakota. The bulk of the forested area, about 53,000 acres, is within the boundaries of Custer National Forest. Timber volumes on the Little Missouri portion of this forest is estimated at about 111,000 M. B. F., 94 per cent of which is soft wood and is exclusively ponderosa pine. The remaining 6 per cent of the total volume is classified as hardwood, the bulk of which is cottonwood, other hardwood species included are green ash and box elder. There are seven small sawmills operating in the basin, two located at Ekalaka, Montana, and five in the vicinity of Camp Crook, South Dakota. Combined output of these mills is estimated at 450 M. B. F. per year. The lumber sawed supplies local demand only. It has been estimated by Forest Service personnel that, if additional markets could be obtained, these forests could sustain an annual cut of 1,000 M. B. F.

The Forestry Branch of the Division of Range and Forest Management, Bureau of Land Management, administers the timber which is located on public domain, the bulk of which is in Crook County, Wyoming. Recently sales involving 9,000 juniper post and 367 M. B. F. of ponderosa pine have been made in this area.

Fire danger in these forested areas is usually quite low with few fires occurring annually. Those fires which do occur are, for the most part, spot fires and fires of less than 10 acres.

### Minerals

At present lignite coal is the most widely spread and abundant mineral resource known in the basin. Deposits of lignite occur in practically all portions of the watershed, and reserves have been estimated in excess of 85,000 million short tons. In the past, this resource has been utilized, but at present no coal is shipped from the basin and very little is mined for local consumption.

Approximately half of the Cedar Creek anticline lies in the Little Missouri Basin. Early discoveries (1912) of oil and gas in this formation have been nearly exhausted and production was shut off in 1950. Recently (1952) new discoveries have been made and the development is now known as the Little Beaver field. Oil and gas prospecting is very active throughout the basin and other new discoveries have been made in the northern portion of the basin, just south of Williston, North Dakota.

Bentonite, of the high swelling type, is mined in the Wyoming portion of the basin and known deposits of this material also exist in southern Carter County, Montana. No processing plants are located in the watershed and all of the mineral mined is transported to processing plants located in the Belle Fourche Basin. Small outcrops of non-commercial bentonite are known to exist in North and South Dakota.

Samples of light weight aggregates, taken from the Marmarth, North Dakota area, show potential for cement manufacture and other related uses.

#### Wildlife

Wildlife is relatively abundant throughout the basin. Native big game species include antelope, white-tail deer and mule deer. Antelope are particularly numerous on the rolling plains. Twelve elk have been planted in the Killdeer Mountains of North Dakota and have been reported as doing well.

Fur-bearing animals include; beaver, muskrat, raccoon, skunk, bobcat, mink, weasel and coyotes. Bobcats and racoon have been steadily increasing in the past years. Coyotes have been effectively controlled through an extensive predator control program and are scarce.

Upland game birds found throughout the basin are; sagehens, pheasants, Hungarian partridge and ruffed and sharptail grouse. Chuckar partridges have been recently planted in the watershed.

Waterfowl are principally native birds, since a large portion of the basin is located off the major flyways, however, some migratory birds pass through the northern portion of the basin. Native species include, mallard and coot.

Fish in the drainages are limited to channel cat, small mouth bass, crappies and blue gills.

## Recreation

The badlands formation of the basin is the principal scenic attraction. The Theodore Roosevelt National Memorial Park, both sections of which are located within the drainage, affords tourists an excellent perception of this interesting erosional phenomenon.

Two districts of the Custer National Forest offer several small campgrounds which are used by local residents and some tourists. Hunting of two major species of big game, antelope and deer, during regular season is possible. Upland game bird, native waterfowl and some migratory waterfowl shooting is to be had.

Fishing is limited to the river, its major tributaries and some of the larger stock water reservoirs.

## Transportation

Transportation facilities within the basin, while sketchy in the southern portion, appear to be adequate.

Two railroads, the Chicago, Milwaukee, St. Paul and Pacific and Northern Pacific, pass through the northern half of the basin from East to West. The Chicago, Milwaukee, St. Paul and Pacific is routed through Baker, Montana, and Marmarth and Rhame, North Dakota. The Northern Pacific passes through Wibaux, Montana and Beach and Medora, North Dakota. The Great Northern Railroad passes north of the basin, but has a spur line which terminates at Watford City, North Dakota. Railroad services for the southern half of the watershed are available in the adjoining Belle Fourche and Lower Yellowstone Basins.

Three East-West U. S. Highways cross the drainage area. U. S. No. 10, through Wibaux, Montana, and Beach and Medora, North Dakota; U. S. No. 12 through Baker, Montana, and Marmarth and Rhame, North Dakota and U. S. No. 212 which passes through Alzada, Montana. State Route No. 7 runs south from Wibaux, Montana through Baker and Ekalaka and joins U. S. No. 212 at Alzada, Montana. This highway provides a market route for the inland portion of the basin. U. S. No. 85 parallels the watershed on the eastern flank and provides a North-South market route.

Numerous county roads, gravel-surfaced and unsurfaced, criss-cross the basin and make even remote areas readily accessible in fair weather. Inclement weather, however, renders many of these roads impassable.

Bus service operates on the U. S. Highways, but there is no North-South bus service in the basin. No airline operates within the area.

## Population

The Little Missouri drainage is very sparsely populated. An estimate based on the 1950 census records indicates that there are only 17,018 inhabitants in the entire basin. Rural areas account for 64 per cent of the total population while 36 per cent dwell in towns and villages.

Beach, North Dakota, is the largest town in the basin with a population of 1,461 and Watford City, North Dakota, is second with 1,371. All other towns located in the basin have a population of less than 1,000.

Following is a list of the principal centers of population and their inhabitants:

South Dakota		North Dakota	
Camp Crook	122	Beach	1,461
		Watford City	1,371
Montana		Sentinel Butte	229
		Arnegard	206
Ekalaka	904	Medora	175
Wibaux	739	Golva	174
Alzada	50	Amidon	82

## LAND OWNERSHIP AND MANAGEMENT PROGRAMS

The Little Missouri River drainage covers a total of 6,080,000 acres. Of this total, 34 per cent or approximately 1,684,000 acres, is under the jurisdiction of the Federal government. The remaining 66 per cent is in private and State ownership.

The Fort Berthold Indian Reservation, located in the extreme northern portion of the basin, covers approximately 350,000 acres, or 6 per cent of the area. This land is used for grazing of livestock, production of hay and in some cases cultivated crops. This land is under the overall administration of the Bureau of Indian Affairs.

The Theodore Roosevelt National Memorial Park, located in

the badlands north of Medora, North Dakota, is administered by the National Park Service. This park was set aside to provide for public inspection of an interesting formation and to commemorate the site of Theodore Roosevelt's ranching enterprise in North Dakota. The park covers a total of 70,588 acres, or approximately 1 per cent of the basin.

The Custer National Forest covers a gross area of 53,000 acres within the drainage, most of which is situated in Carter County, Montana. This land is administered through two district offices, one located at Ekalaka, Montana, and one at Camp Crook, South Dakota.

There are three Land Utilization Projects in the area. The largest, ND-24, the bulk of which lies in the Little Missouri drainage, covers parts of four counties in North Dakota. A small part of Land Utilization Project, MT-21, covers that portion of the Little Missouri drainage in Fallon, County, Montana, and WY-21 covers a very small part of the area in Campbell and Crook Counties, Wyoming.

These projects were established under the provisions of Title III of the Bankhead-Jones Farm Tenant Act of July 22, 1937. The Secretary of Agriculture is authorized by this Act, "to develop a program of land conservation and land utilization . . . He is authorized to acquire by purchase, gift or devise, or by transfer from any agency of the United States, submarginal land and land not primarily suitable for cultivation, to improve, develop and administer any property so acquired."

These projects contain about 1,043,000 acres which were purchased by, and transferred to, the Secretary of Agriculture for management. In the past this land has been administered for grazing by the Department of Agriculture, through the Soil Conservation Service, with direct leases to the users and through leases to Grazing Associations. Substantially all federally-owned lands in these land-use projects were acquired during the drought and depression of the 1930's. They were lands, under various types of ownership, the majority of which were considered submarginal for crop production. At the time the lands were also a serious menace from the stand point of soil erosion, however, favorable climatic conditions, and good land management practices during the past decade have contributed to a marked improvement, and most of the soils are now stabilized with a satisfactory vegetative cover.

Effective January 1, 1954, this land has been transferred,



within the Department of Agriculture, from the Soil Conservation Service to the Forest Service.

County lands within the basin are basically limited to administrative and road material sites, only in a few isolated cases are there lands in county ownership use for grazing. The past decade of favorable climatic conditions and high prices have materially contributed to the redemption of the tax delinquent lands.

There are eight Soil Conservation district operating all or partly within the drainage. The more important conservation practices carried out by these districts are; farm planning, correct land use, crop rotation, land leveling, farm irrigation, water distributing systems (on small scale), noxious weed control, contour farming, gully control, summer fallow, grassed waterways and windbreak plantings. Range management practices include proper stocking, water spreading and range reseeding. Other range practices include the construction of stockwater reservoirs and spring development to provide more uniform utilization of the range.

#### LANDS CONTROLLED BY THE BUREAU OF LAND MANAGEMENT

The Bureau of Land Management has jurisdiction over 573,857 acres in the Little Missouri Basin. This acreage represents about 9 per cent of the lands in the area. From an overall stand point this land constitutes a small portion of the drainage, however, in areas of heavy concentration, it forms a very important component of the livestock raising economy. The North Dakota portion comprises 50 per cent of the area, but contains only 10 per cent of the public domain, most of which is in widely scattered parcels. The South Dakota portion constitutes 6 per cent of the basin and contains 2 per cent of the public land. The Wyoming portion makes up 8 per cent of the drainage area and contains 12 per cent of the public domain. The remaining 36 per cent of the basin is in Montana and contains 76 per cent of the vacant public domain.

By and large the public lands occupy the relatively poorer soils and rougher terrain within the basin. They are valuable primarily for grazing of livestock and game.

Subarea No. 1

As can be seen from the public domain map accompanying

this report and table No. 1, the watershed may be divided roughly into two parts on the basis of concentration of public domain land. The Montana portion (part of Carter County and part of Fallon County), the Wyoming portion (part of Crook County) and a small portion of North Dakota (part of Bowman County) contain about 78 per cent of the public land in the basin. For ease of designation, the described area will be known as Subarea No. 1. All lands within this subarea, except those portions of North Dakota and Wyoming, are inside the boundaries of Montana Grazing District No. 3. The lands are used for grazing by both cattle and sheep operations in conjunction with privately owned lands on a six month base-property basis. The average size operation is about 250 animal units. The area also provides excellent habitat for wildlife, especially antelope, which have been estimated to exceed 5,000 in number in this vicinity.

Considerable range improvement work has been done in this portion of the basin, including the construction of stockwater reservoirs, allotment fences, and water spreaders. The Alzada water spreader, the oldest and best known improvement development in the subarea, was started in 1944. Excellent results were obtained with this project and have stimulated subsequent developments of similar nature throughout the region.

Lands withdrawn for stock-driveway are located, adjacent to this subarea, in Harding and Butte Counties, South Dakota. This driveway once formed a link in an extensive trail system which radiated from the market-town of Belle Fourche, South Dakota. It is the sole remaining remnant of a form of livestock movement which is passing from the modern scene. An administrative stock-driveway, situated near Alzada, Montana, is equipped with corrals and loading chutes. This particular development is used for inspection of livestock, both leaving and entering Montana.

It is important that the public domain in this area be studied in detail to determine its highest use and potentialities under properly integrated use, so that the orderly program for administration and management or disposition may be facilitated. Due to the large concentration of public land in the unit and the interrelationship of land use, it is proposed that the Area Classification method of investigation be applied in the detailed study of this subarea.

#### Remaining Public Domain Lands

The remaining 22 per cent of the public domain is situated

Table 1.- Summary of Land Status in the Little Missouri Basin, 1953

Department of Interior:	Wyoming	Montana	South Dakota	North Dakota	Percentage	Total Lands
Bureau of Land Management						
Public Domain	68,081	438,265	9,538	56,685	9	572,569
Public Water Reserve		520				520
Stock-driveway			768			768
Indian Service						
(1) Fort Berthold Reservation				350,000 <u>1/</u>	6	350,000
National Park Service				70,588 <u>2/</u>	1	70,588
Sub-Total	68,081	438,785	10,306	477,273	16	994,445
Department of Agriculture:						
Forest Service						
Custer National Forest		51,338	1,628		1	52,966
L. U. Land	8,400	9,599		1,025,275 <u>3/</u>	17	1,043,274
Sub-Total	8,400	60,937	1,628	1,025,275	18	1,096,240
Lands Not In Federal Ownership	384,319	1,701,878	365,666	1,537,452	66	3,989,315
TOTAL LANDS	460,800	2,201,600	377,600	3,040,000	100	6,080,000

1/ Acreage is approximate.

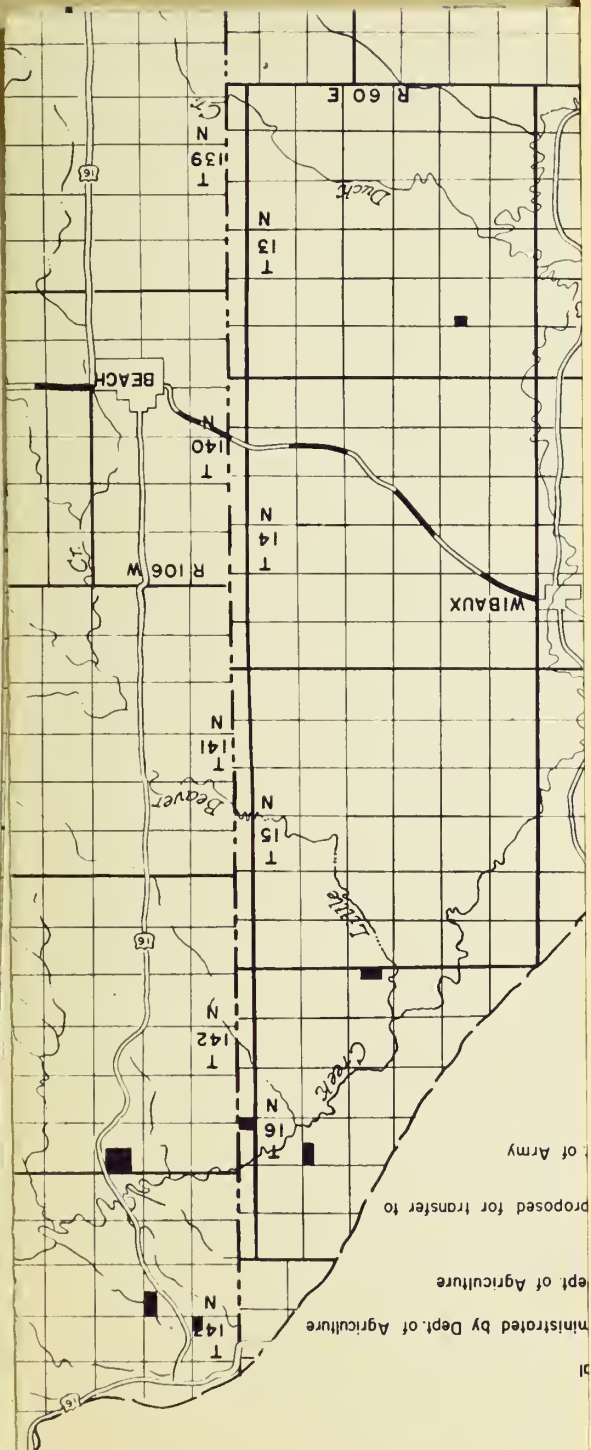
2/ Theodore Roosevelt National Park and Elkhorn Ranch.

3/ This figure includes portions of ND-24, which are not in basin.

in scattered parcels in North and South Dakota and in Wibaux County, Montana. These lands lie outside the boundaries of any grazing district and are so widely dispersed that they are difficult to properly manage or develop. They are, for the most part, under lease to contiguous owners and are used for grazing purposes in conjunction with privately owned lands.

There are a few scattered tracts of public domain land located along the Missouri and Little Missouri Rivers, which may or may not be inundated by the waters of Garrison Reservoir. These tracts should be given special attention in that they may have future value as recreational sites.

It is necessary that each of these tracts be examined and the highest use and potential of each determined, but owing to their wide dispersal, it is recommended that the isolated tract method of detailed study be employed in the investigations in this portion of the basin.



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RIVER BASIN  
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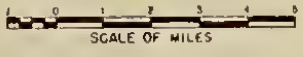
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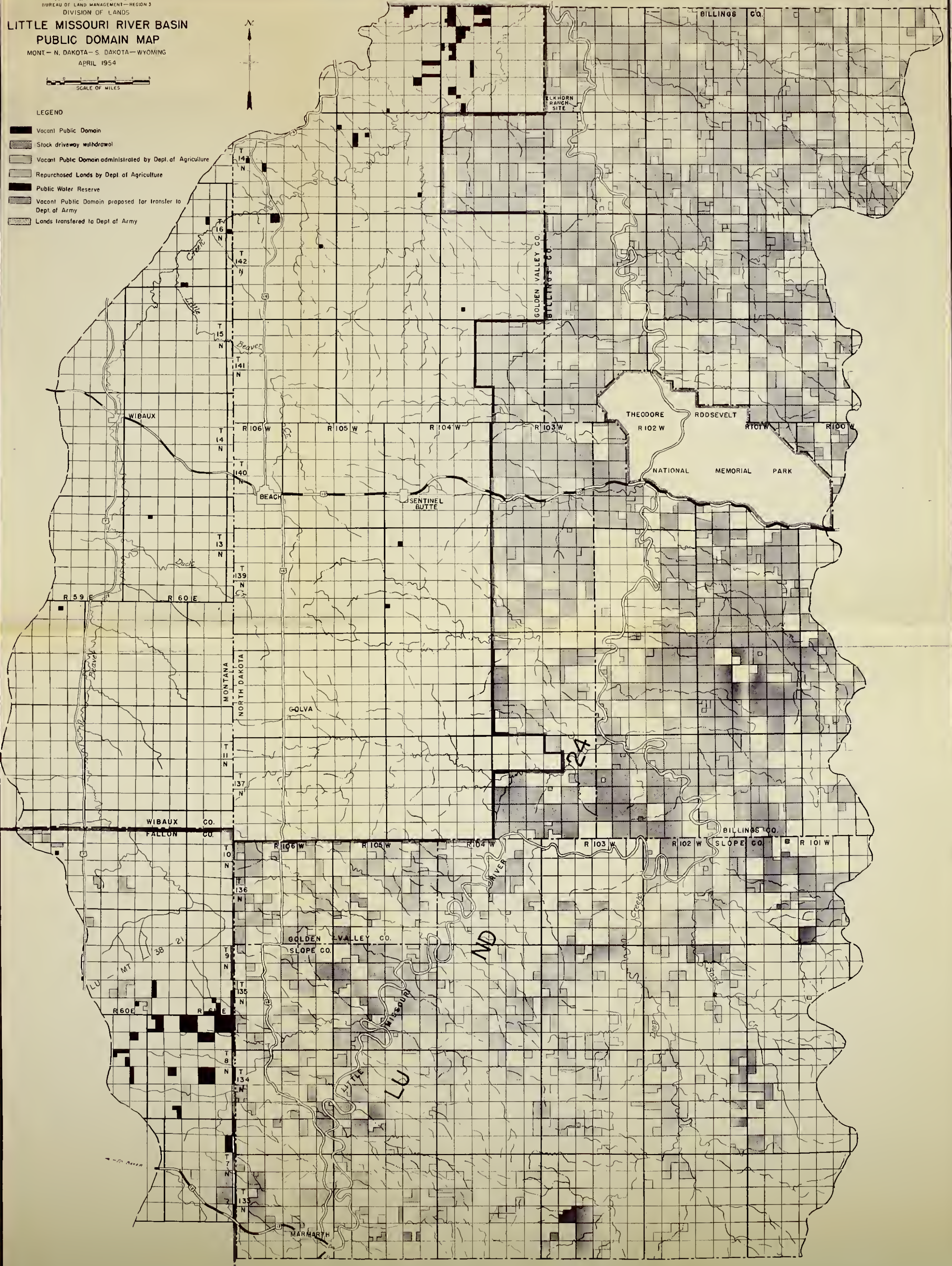
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# LITTLE MISSOURI RIVER BASIN PUBLIC DOMAIN MAP

MONT—N. DAKOTA—S. DAKOTA—WYOMING  
APRIL 1954

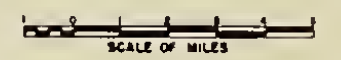


- LEGEND
- Vacant Public Domain
  - Stock driveway withdrawal
  - Vacant Public Domain administered by Dept. of Agriculture
  - Repurchased Lands by Dept. of Agriculture
  - Public Water Reserve
  - Vacant Public Domain proposed for transfer to Dept. of Army
  - Lands transferred to Dept. of Army



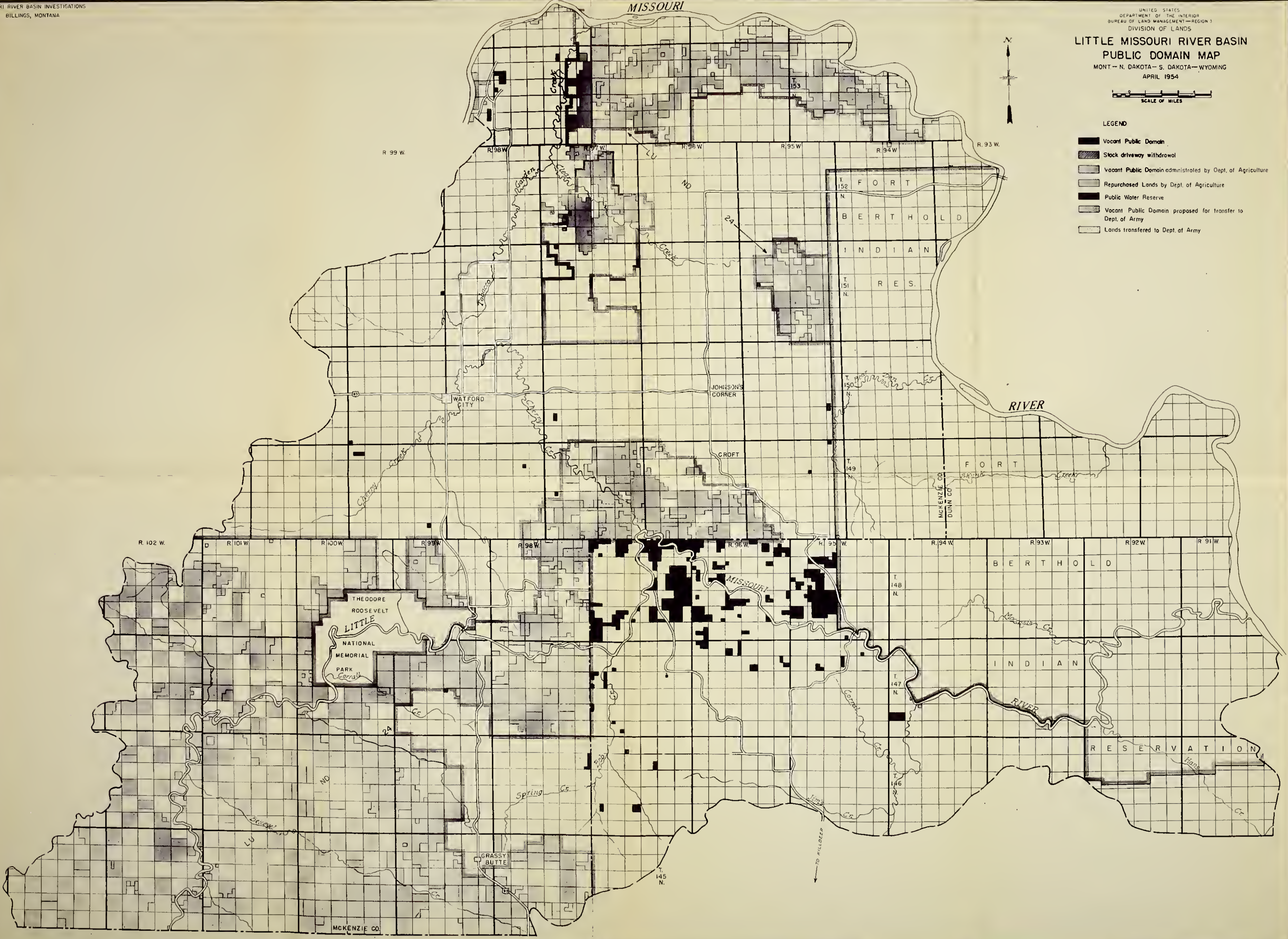
### LITTLE MISSOURI RIVER BASIN PUBLIC DOMAIN MAP

MONT.—N. DAKOTA—S. DAKOTA—WYOMING  
APRIL 1954



#### LEGEND

- Vacant Public Domain
- Stock driveway withdrawal
- Vacant Public Domain administered by Dept. of Agriculture
- Repurchased Lands by Dept. of Agriculture
- Public Water Reserve
- Vacant Public Domain proposed for transfer to Dept. of Army
- Lands transferred to Dept. of Army







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- LEGEND
- Vacant Public Domain
  - Stack driveway withdrawal
  - Vacant Public Domain administered by Dept of Agr.
  - Repurchased Lands by Dept of Agriculture
  - Public Water Reserve
  - Vacant Public Domain proposed for transfer to Dept of Army
  - Lands transferred to Dept of Army

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BUREAU OF LAND MANAGEMENT—REGION 3  
DIVISION OF LANDS

**LITTLE MISSOURI RIVER BASIN  
PUBLIC DOMAIN MAP**

MONT—N DAKOTA—S DAKOTA—WYOMING

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