

PROSPECTING

for  
**gold**  
in the  
united  
states

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

# PROSPECTING IN THE

Prospecting for gold is something that probably everyone dreams of trying at least once. To the person who is mainly concerned with this activity as a vacation diversion, prospecting offers a special excitement. There is a constant hope that the next pan of sediment may be "pay dirt," and no other thrill can compare with that experienced when one sees even a few tiny flecks of gold glittering in the black sand at the bottom of his pan. The search itself is its own reward for the efforts expended by the vacation prospector. The would-be prospector hoping for financial gain, however, should carefully consider all the facts of the situation before deciding to set out on a prospecting expedition.

It is a conservative estimate that fewer than one in each thousand persons who have prospected in the western part of the United States ever made a "strike." Most of the gold mining districts in the West were located by the pioneers, many of whom were experienced gold miners from

# FOR GOLD UNITED STATES

Alabama and Georgia, but even in pioneering times only a small proportion of the gold seekers actually found valuable deposits. In the hundred years and more that have elapsed since the earliest discoveries, the country has been thoroughly covered by prospectors. The most recent period of intensive prospecting for gold was during the depression of the 1930's when prospectors from all over the country swarmed into the better-known gold-producing areas throughout the nation, especially in the West, and into the little-known areas as well. No comprehensive summary of the results of their activities was ever assembled, but from surveys of limited areas made by State officials and other competent observers it seems that an extremely low percentage of the total number were even able to support themselves by their earnings. Of the few significant discoveries reported, nearly all were made by prospectors of long experience who were familiar with the regions in which they were working.

The lack of outstanding success in spite of the great increase in prospecting during the depression appears to confirm an impression already held by many of those most familiar with the occurrence of gold and the development of gold mining districts—namely, that the best chances of success lie in further systematic study of known productive areas, rather than in efforts to discover unknown areas. However, the development of new, highly sensitive and relatively economical methods of detecting gold has greatly increased the possibility of discovering gold deposits too low grade to have been recognized heretofore by the prospector armed only with a gold pan, but large enough to be exploited by modern mining and metallurgical techniques. The one large new gold mine of recent years, the Carlin mine near Carlin, Nev., was opened only after intensive scientific and technical efforts had been made.



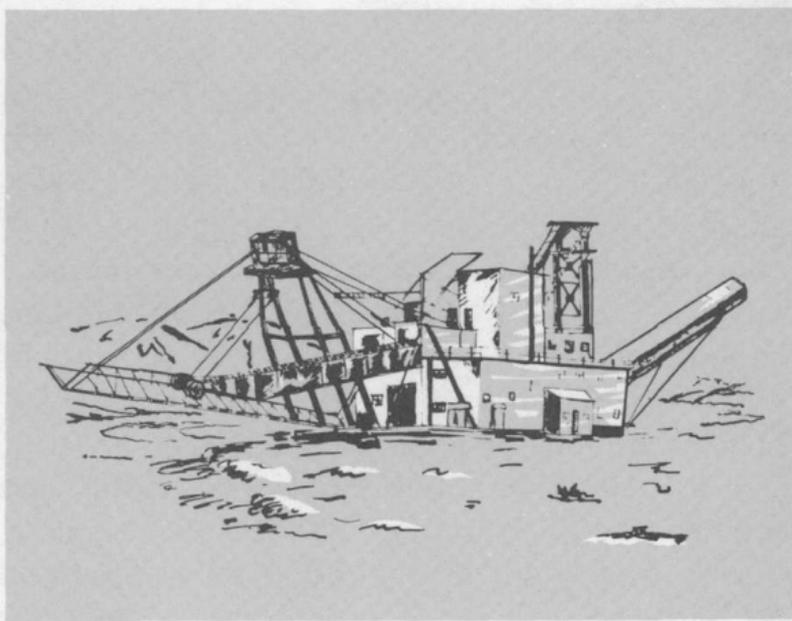
Many people believe that it is possible to make wages or better by panning gold in the streams of the West, particularly in regions where placer mining formerly flourished. What they do not realize is that most placer deposits have been thoroughly reworked at least twice—first by Chinese laborers, who entered immediately after

the initial boom periods to glean the lower grade deposits and the tailings, and later by itinerant miners during the depression of the 1930's. Geologists and engineers whose field work has led them into the more remote parts of the country have found innumerable small placer diggings and old prospect pits, whose number and wide distribution imply that few, if any, recognizable surface indications of metal-bearing deposits have been overlooked.

Anyone who contemplates prospecting for gold should give serious thought to several consistent trends that have characterized the gold mining industry since the resumption of precious-metal mining after World War II. One of these is the combination of a fixed selling price (\$35.00 an ounce) with constantly increasing mining costs, which has resulted in a steady yearly decline in output. This is in contrast to an increase in gold mining activity elsewhere in the world. For example, in 1964 the world gold output was 53 million ounces, a record high, whereas U.S. production was 1.45 million ounces, roughly the same as that of 1963, which was the lowest peacetime annual production in 100 years. Another trend is the increase in the proportion of gold produced in the United States as a byproduct of base-metal ores, while at the same time the yields from placers are declining. In 1963, 36 percent of the domestic gold production was from base-metal ores, and only 13 percent came from placers. The remaining 51 percent came from lode mining. A third trend is the disappearance of small producers, with the result that a small number of large mines produce most of the gold mined in the United States. The Homestake mine in South Dakota accounted for more than 1/3 of the total U.S. gold production in 1964. Successful gold mining under present conditions must be a large-scale operation, employing costly and sophisticated machinery to handle huge tonnages of low-grade ore. The grizzled prospector and his burro have departed from the mining scene;

the small individual producer is no longer a significant factor in mining.

A chance of some degree of success may still remain for those choosing favorable areas after a careful study of the mining record and the geology of the mining districts. Serious prospecting should not be attempted by anyone without sufficient capital to carry on a long and possibly discouraging campaign of preliminary work. If the prospective gold seeker has ample means to take him from his home to the region he selects and to support him in the field, is prepared to undergo a certain amount of hardship, possesses a car capable of traveling the roughest and steepest roads, and is not discouraged by repeated disappointments, a prospecting trip in the West may prove to be an interesting experiment, profitable to him in other ways if not financially. It is mainly for his information that the following brief review of various gold mining regions is presented. Summaries of the important gold-producing districts of the United States are contained in the map reports of the Geological Survey listed at the back of this pamphlet. Also listed are the geological agencies of the principal gold-producing States where additional information can be obtained.



## PLACER DEPOSITS

A placer deposit is a concentration of some sought-after natural material that has accumulated in the unconsolidated sediments of a stream bed. Heaviness and resistance to corrosion make gold an ideal substance to accumulate in placer deposits close to the source rocks from which it has come. In addition to these properties, the bright characteristic color of gold, easily recognizable even in very small amounts, makes recovery by gravity separation feasible. Panning is the simplest, easiest, and least expensive method of separating the gold from the silt, sand, and gravel of the stream deposits. It is, moreover, the method most commonly employed by the beginning prospector.

Many placer districts in California, the leading gold-producing State, have been mined on a large scale as recently as the mid-1950's. The streams that drain the rich Mother Lode—the Feather, Mokelumne, American, Cosumnes, Calaveras, and Yuba Rivers—and the Trinity River in northern California have concentrated considerable gold in gravels. In addition, placers occur in remnants of an older erosion cycle—the Tertiary gravels—in the same general area.

The bulk of the gold mined in Alaska has come from placers; these are widespread, occurring along nearly all the major rivers and their tributaries. Some beach sands have also been productive. The principal placer-mining region has been the Yukon River basin, which crosses central Alaska and includes the extensive deposits at Fairbanks. Dredging in the Fairbanks district has produced more gold than in any other district in Alaska. Although it is predominantly a placer district, it also ranks high among the lode districts. The beach deposits in

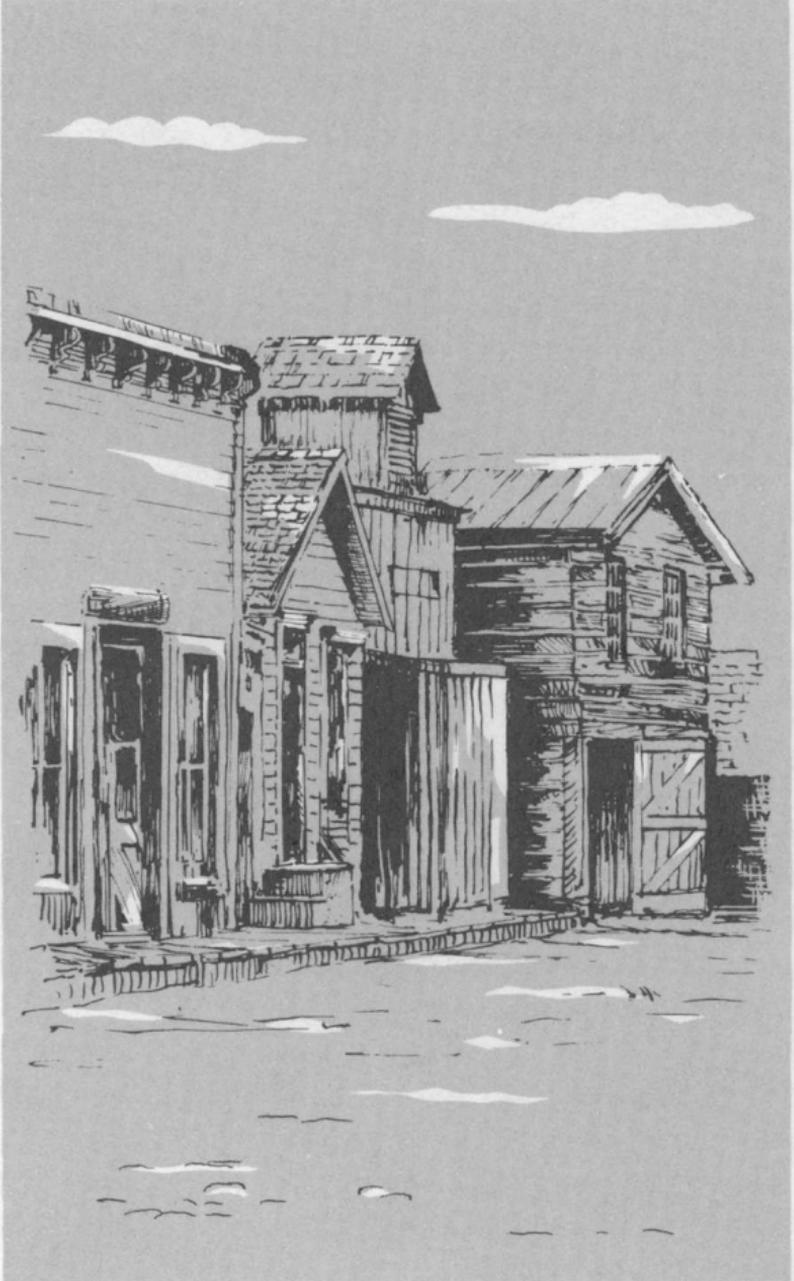
the Nome district, in the south-central part of the Seward Peninsula, rank second among productive placer deposits of Alaska. Other highly productive placers have been found in the drainage basin of the Copper River and of the Kuskokwim River.

In Montana, the principal placer-mining districts are in the southwestern part of the state. Some of the most important placer localities are on the Missouri River in the Helena mining district, where the famous Last Chance Gulch is located. Many districts are farther south, on the headwaters and tributaries of the Missouri River, especially in Madison County, which ranks third in total gold production in Montana and has produced more placer gold than any other two counties in the State. The most productive placer deposit in Madison County—and in the entire State of Montana—has been that at Alder Gulch, near Virginia City. Gold has been produced at many places on the headwaters of the Clark Fork of the Columbia River, particularly in the vicinity of Butte, although in later years the placer production from this district has been overshadowed by the lode production.

A large proportion of the gold produced in Idaho has come from placer deposits, Idaho having been at one time one of the principal placer-mining States. One of the chief dredging areas is in the Boise Basin, a few miles northeast of Boise, in the west-central part of the State. Other well-known placer localities are situated along the Salmon River, in Lemhi and Idaho Counties, and on the Clearwater River and its tributaries, particularly at Elk City, Pierce, and Orofino. Extremely fine-grained (or "flour") gold is found in the sands of the Snake River in southern Idaho.

Placers in Colorado have been highly productive in the Fairplay district in Park County, and in the Breckenridge district in Summit County. In both areas large dredges were used during the peak activity of the 1930's.

In Oregon, the tributaries of the Rogue River and neighboring streams in the Klamath Mountains have been sources of placer gold. Among the main producing districts in this region are



the Greenback district in Josephine County and the Applegate district in Jackson County. The most important mining regions of Oregon are in the northeastern part of the State, where both lode and placer gold have been found. Placer gold occurs in many streams that drain the Blue and Wallowa Mountains. One of the most

productive placer districts in this area is in the vicinity of Sumpter, on the upper Powder River. The Burnt River and its tributaries have yielded gold. Farther to the West, placer mining (particularly dredging) has been carried on for many years in the John Day River valley.

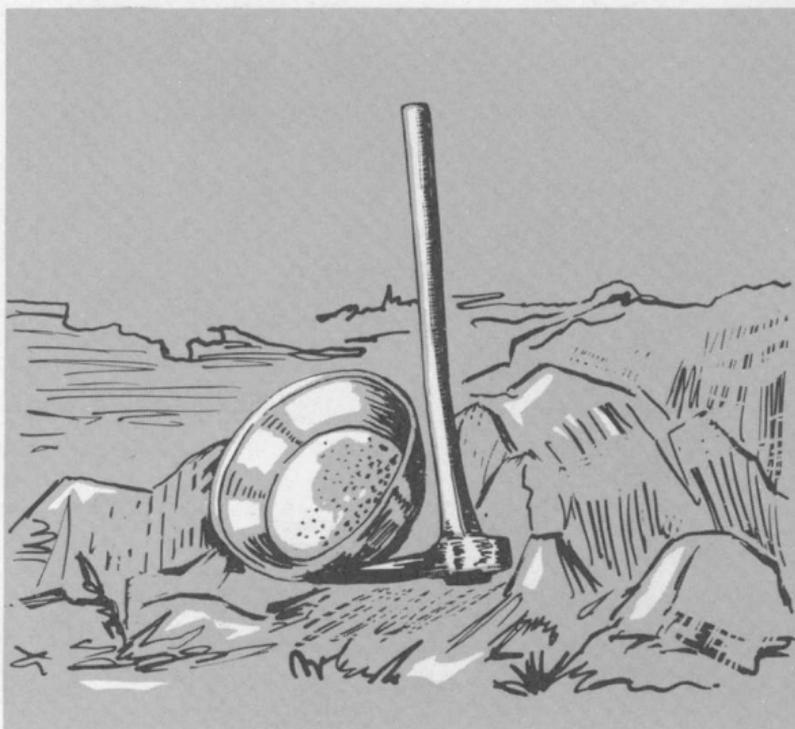
Placer operations are not very important in the gold production of the other western mining States, although minor amounts of placer gold have been produced in South Dakota (the Black Hills region, particularly in the Deadwood area, and on French Creek, near Custer) and in Washington (on the Columbia and Snake Rivers).

In addition to the localities mentioned above, placer gold has been found along many of the intermittent and ephemeral streams of arid regions, in parts of Nevada, Arizona, New Mexico, and southern California. In many of these places a large reserve of low-grade ground still exists, but the lack of a permanent water supply necessitates the use of expensive dry or semi-dry concentration methods to recover the gold.

In the eastern States, limited amounts of gold have been washed from some of the streams that drain the eastern slope of the southern Appalachian region, including parts of Maryland, Virginia, North Carolina, South Carolina, Georgia, and Alabama. Many saprolite deposits of this general region have also been mined by placer methods, and a small amount of gold has been obtained from placer deposits in New England. Some gold was produced in the East prior to the discovery of the California gold deposits. Other placer deposits in the East may be discovered but prospecting for them will require substantial expenditures of time and money; they probably will be of low grade, difficult to recognize, and costly to explore and sample. Moreover, at the present time, ownership of all land in the East is such that mining claims cannot be staked, and prospecting can be carried on only with permission of the owner of the land.

## LODE GOLD

Lode gold is gold in place within the solid rock in which it has been deposited. The areas in this country that are at all likely to contain valuable lode deposits of gold have already been explored so carefully and thoroughly that now the inexperienced prospector without ample capital has very little chance of discovering a lode rich enough to be worth developing. As stated in the introduction most future discoveries of workable gold ore probably will be made as a result of further investigations in areas already known to be productive. The districts in which such new discoveries of gold are possible are too many for all to be named in this leaflet, but some of the famous ones are as follows: In California, the Mother Lode, Grass Valley-Nevada City, and Allegheny districts; in Colorado, the Cripple Creek district and the districts of the San Juan region; in Nevada, the Goldfield and Comstock Lode districts; in the Black Hills of South Dakota, the Lead districts; and in Alaska, the Juneau district.

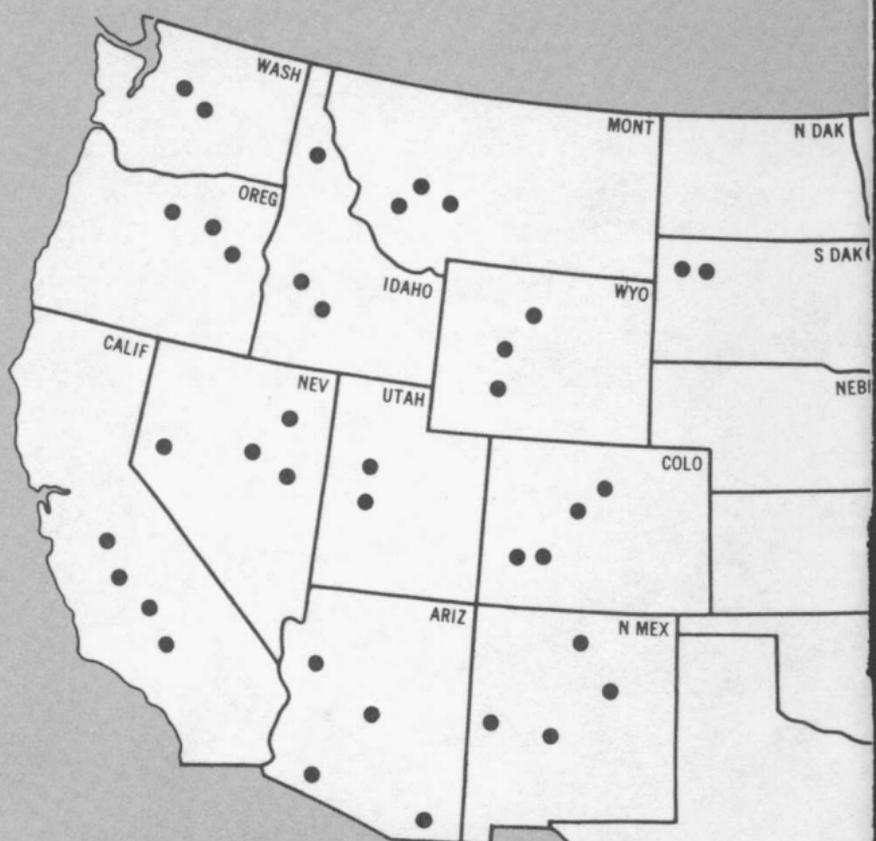


## SELECTED MAP REPORTS of the GEOLOGICAL SURVEY

MR-24. Gold in the United States, exclusive of Alaska and Hawaii, by A. H. Koschmann and M. H. Bergendahl. 1962. Scale, 1:3,168,000. 75¢

MR-32. Lode gold and silver occurrences in Alaska, by E. H. Cobb. 1962. Scale, 1:2,500,000. 75¢

MR-38. Placer gold occurrences in Alaska, by E. H. Cobb. 1964. Scale, 1:2,500,000. 50¢



Areas that have been major gold  
producers in the United States

These maps are available for purchase from the U.S. Geological Survey at the following addresses:

Washington, D. C. 20242.

Denver Federal Center, Denver, Colorado 80225

MR-32 and MR-38 are also available for purchase from the U.S. Geological Survey at 310 First Avenue, Fairbanks, Alaska 99701.



## **STATE AGENCIES FROM WHICH INFORMATION ON PROSPECTING AND MINING CAN BE OBTAINED**

Geological Survey of Alabama, University, Ala.  
35486

Alaska Division of Mines and Minerals, State  
Capitol Building, Juneau, Alaska 99801

Arizona Bureau of Mines, University of Arizona,  
Tucson, Arizona 85721

California Division of Mines and Geology, Depart-  
ment of Conservation, Ferry Building, San  
Francisco, California 94111

Colorado Mining Industrial Development Board, 204  
State Office Building, Denver, Colorado 80202

Georgia Department of Mines, Mining and Geology,  
State Division of Conservation, 19 Hunter  
Street, S. W., Atlanta, Georgia 30303

Idaho Bureau of Mines and Geology, University of  
Idaho, Moscow, Idaho 83844

Montana Bureau of Mines and Geology, Montana  
College of Mineral Science and Technology,  
Butte, Montana 59701

Nevada Bureau of Mines, University of Nevada,  
Reno, Nevada 89507

New Mexico State Bureau of Mines and Mineral  
Resources, New Mexico Institute of Mining and  
Technology, Socorro, New Mexico 87801

North Carolina Division of Mineral Resources,  
Department of Conservation and Development,  
State Office Building, Raleigh, North Carolina  
27600

Oregon State Department of Geology and Mineral  
Industries, 1069 State Office Building, Portland,  
Oregon 97201

South Carolina Division of Geology, State Develop-  
ment Board, P. O. Box 927, Columbia, South  
Carolina 29200

South Dakota State Geological Survey, Science Center, University of South Dakota, Vermillion, South Dakota 57069

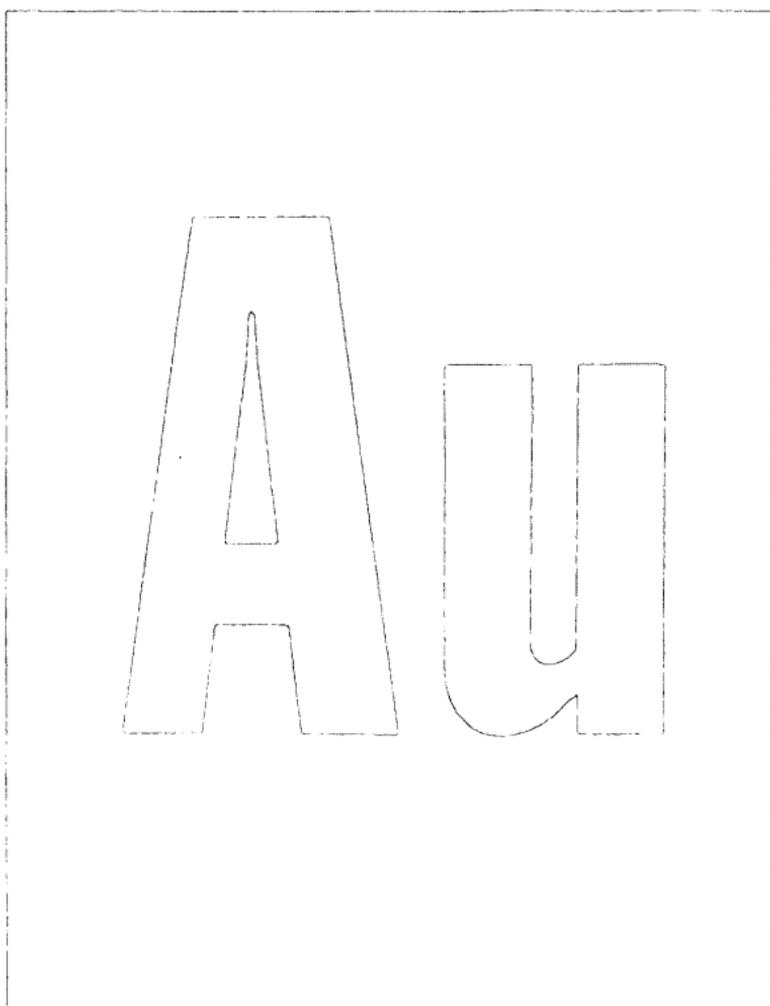
Texas Bureau of Economic Geology, University of Texas, Austin, Texas 78712

Utah Geological and Mineralogical Survey, 103 Civil Engineering Building, University of Utah, Salt Lake City, Utah 84102

Virginia Department of Conservation and Economic Development, Division of Mineral Resources, Natural Resources Building, Box 3667, Charlottesville, Virginia 22901

Washington Division of Mines and Geology, Department of Conservation, 335 General Administration Building, Olympia, Washington 98501

Geological Survey of Wyoming, University of Wyoming, Laramie, Wyoming 82070



Created in 1849, the Department of the Interior—America's Department of Natural Resources—is concerned with the management, conservation, and development of the Nation's water, wildlife, mineral, forest, and park and recreational resources. It also has major responsibilities for Indian and Territorial affairs.

As the Nation's principal conservation agency, the Department works to assure that nonrenewable resources are developed and used wisely, that park and recreational resources are conserved for the future, and that renewable resources make their full contribution to the progress, prosperity, and security of the United States—now and in the future.

