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SKIN DIVING FOR GOLD IN OREGON*

Introduction

The combination of leisure time, the lure of gold lying hidden in the riffles of a stream, and inexpensive diving equipment has inevitably produced a large demand for information on diving for placer gold. This article has been prepared to assist and inform the prospective skin diver who wants to try his luck looking for gold in Oregon. Most of the information on methods and equipment has been abstracted from the very comprehensive article by W. B. Clark, "Skin diving for gold in California", which appeared in the June, 1960, issue of Mineral Information Service of the California Division of Mines. Additional references to articles concerned with placer gold mining appear at the end of the article. Information may also be obtained from the two field offices of the department, which are located in the main placer gold areas in the state at Baker and Grants Pass, also at the head office in Portland.

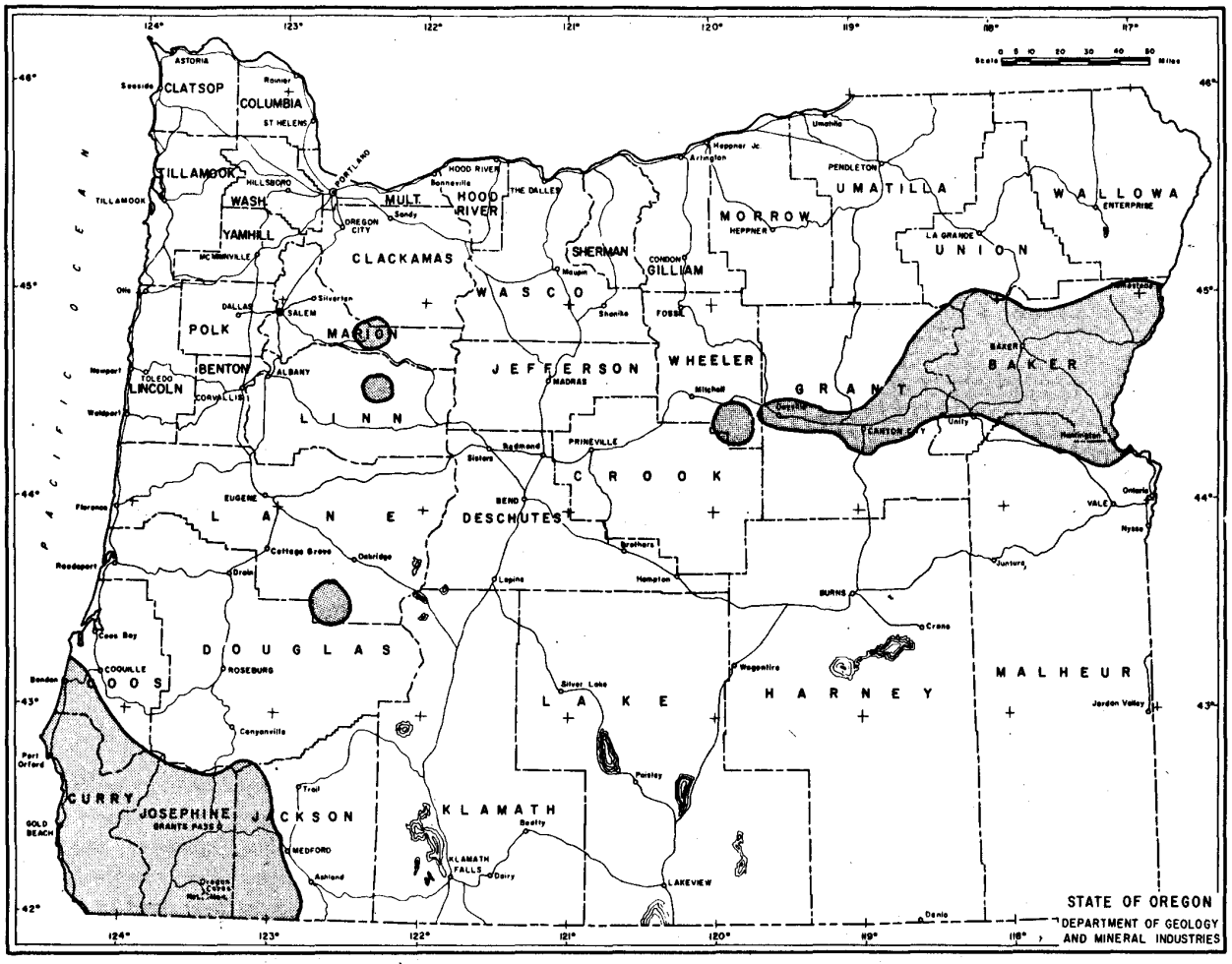
History and economics

It should be emphasized that from a purely economic standpoint the chances of recovering significant amounts of gold by skin diving are poor. Occasional "finds" of very rich material tend to overshadow the meager returns obtained by the majority of the prospectors. From a recreational angle, however, the rewards are great since the activity includes generous portions of outdoor living in areas often remote from civilization and work in the murky depths of a stream with equipment far removed from that used in daily life. Add to this the ever-present possibility that there may be gold in the next panful, and the attraction of skin diving for gold becomes clear.

Historically, the recovery of placer gold in Oregon began in July, 1850, with the discovery at the confluence of Josephine Creek and the Illinois River in Josephine County (Spreen, 1939). The deposits found in Rich Gulch near Jacksonville in January of 1852 touched off the first of a long series of "rushes" to various parts of the state. Placer gold has been mined continuously in Oregon ever since. Gold which had been accumulating in the streams for thousands of years was soon mostly gone. Low-grade areas were temporarily ignored in favor of richer claims. Later on the poorer sections of the streams were worked with more elaborate and efficient equipment. Today the skin diver must concentrate on those places that were either too small for large-scale operations or were inaccessible because of depth of water. A careful study should be made of an area before deciding where to prospect, since much time and money can be wasted in searching in areas which have been worked thoroughly already.

Over the years the placer miner has progressed from the simple gold pan, which was entirely adequate for the very rich stream placers first discovered, to the long tom, the rocker, the hydraulic giant with greatly enlarged and extended sluices, the connected bucket dredge, the "doodlebug" or portable washing plant fed by an independent power shovel or dragline, to a wide variety of earth-moving and gold-recovery devices nearly all of which are easily transportable and designed to work small, irregular areas. Skin-diving equipment has been used in the state only recently but has been gaining rapidly in popularity. Many attempts have been made to recover stream gold with small floating suction pumps and hoses operated from the surface, but these have not been successful, mainly because of inability to control and direct the suction nozzle properly. The use of skin-diving equipment, which permits use of underwater gold-saving devices, should increase the efficiency of this phase of the operation.

*Compiled by Ralph S. Mason, Mining Engineer, State of Oregon Dept. of Geology and Mineral Industries.



Generalized Map of Placer Mining Areas in Oregon

Possible placer gold areas in Oregon

Placer gold has been reported from many streams in Oregon but, generally speaking, the gold-bearing streams that have been important producers in the past are concentrated in two widely separated areas in the northeastern and southwestern corners of the state. The accompanying map shows these two principal areas as well as four smaller localities which have been moderately productive over the years. Streams draining the Bohemia district in southern Lane County, particularly Sharps, Martin, and Steamboat creeks, have been moderately productive. The Little North Fork of the Santiam River above Elkhorn in Marion County, Quartzville Creek in the vicinity of Quartzville in Linn County, and Spanish Gulch near Antone in Wheeler County have seen placering activity.

The skin diver can obtain much useful information about the various areas in which he wishes to prospect from topographic maps issued by the United States Geological Survey. Such maps on a scale of one inch to the mile are available for all of southwestern Oregon. For eastern Oregon, topographic maps cover part of the area, although some of them are on a scale of one-half inch to the mile.

Many of Oregon's gold-bearing streams are too small for serious skin diving during the summer months. There are occasional pools where diving gear could be used, however, and prospectors equipped with face masks and snorkels could explore the shallow streams that are too deep to wade but too shallow to dive in.

Prospecting and mining methods

Once a stream has been selected for prospecting by skin diving methods it is important to recognize the most favorable places for the occurrence of gold. Mineral Information Service explains the procedures as follows:

... The first step involves a careful examination of the streams and the terrain adjacent to them. Natural features that should be noted are the topography, nature of the bedrock including joint and crevice systems, stream currents, bends in the stream, and visible underwater features such as crevices, large boulders, or any other type of barrier. The deposition of gold is the result of the action of flowing water coupled with the shape of the stream channel and stream bed which have acted as natural traps. The processes involved in the action of flowing water are extremely complex as they are dependent upon a number of variable factors, the most important of which are (1) shape of the channel, (2) volume of water and (3) the slope of the stream channel.

Wherever the natural features or a change in the volume of water flowing have caused a sudden decrease in stream velocity, conditions are favorable for gold prospecting. A decrease in velocity lowers the carrying power of the stream which begins to deposit its load. The heaviest particles including gold will be dropped first. Thus concentration of gold can be expected where the stream widens, near quiet pools below rapids, or along bends in the channel. In a straight channel the current is swifter near the middle than near the sides, and swifter above mid-depth than below. At bends the transportation and deposition of gold become extremely complicated. Velocities within the stream change so that the greatest velocity is near the outer or concave bank.

Next, examine the stream bank for gold between the high water mark and the water level. Material in narrow cracks and crevices should be removed with the crevicing tool and panned. Material from the downstream side of half-buried obstructions also should be examined. In addition, fine roots, moss, or other vegetal material near the water should be examined as they will commonly trap fine particles of gold. If gold or "colors" are found in the pan, that area of the stream is a good place to prospect further.

Initial underwater exploration in the stream should be done with the snorkel. This avoids the large amount of work involved in carrying and setting up mining equipment in case the stream proves to be unfavorable. The initial underwater trip is to determine the configuration, location of natural gold traps, and the nature of currents. Deep narrow crevices and cracks, especially those that occur in steeply dipping rocks whose strike or trend is perpendicular to the stream flow, are particularly favorable for the occurrence of gold. A series of parallel deep narrow cracks are especially good as they form natural riffles. Such traps are most likely to be found in gneiss and heavily jointed granitic and volcanic rocks. In some cases long trough-like crevices that are parallel to the stream flow act as natural sluice boxes. Natural irregularities at the bottom act as riffles or pockets to catch the gold. Sometimes deep potholes are good gold traps. Potholes have been scoured out in the bedrock by gravels being spun around by eddying currents. They are most common below falls and rapids and most abundant in crystalline limestone and granitic rocks. However, the scouring action also may tend to grind up and dissipate the gold. The downstream side of large boulders or any type of obstruction may be favorable sites since the eddying motion on the downstream side facilitates the deposition of gold.

The gold is almost always concentrated near and at the bottom of such natural traps. It occurs as flat or rounded grains and flakes ranging from microscopic size to nuggets several inches across. The coarser gold usually is found at the greatest depths. Because many of the streams have been mined in past years and the gold usually was recovered by amalgamation with mercury, some of the gold found at the present time may have been partially amalgamated with mercury and be nearly white in color. Native mercury occasionally is found also at the bottom of such streams. The gold is always associated with black sands that are composed chiefly of magnetite and smaller amounts of ilmenite, zircon, and garnet. Usually small amounts of pyrite or "fool's gold" are present in black sand. Small grayish-white grains and nuggets of platinum may be present but usually only in very small amounts. Also present in some of the stream beds are lead shot, old nails, small bits of scrap iron, and occasionally old coins, etc. The presence of metal should be carefully noted when prospecting. The gold-bearing black sands are near or at the bottom of the natural traps and usually are covered by accumulated sands, gravels, cobbles, boulders, and wood fragments. Sometimes the overburden itself will contain values. The particles of gold found in the streams originally came from veins, mineralized zones, and older placer deposits from which they were released by weathering and disintegration of the rock.

When prospecting a crevice underwater, the loose overburden can be partially removed by "fanning" it with cupped hands, and the heavier gold-bearing black sands at the bottom can be removed with the crevicing tool. The gold sniffer is especially valuable here. Efforts should be made to determine the exact spot for mining operations. There is no magic formula to determine the presence of gold. The finding of gold is partly luck and partly intelligent prospecting and painstaking observation. A knowledge of the gold-bearing regions in the state is extremely important.

After the area to be mined has been selected, the equipment is carried down to the stream and set up. The jet dredge is operated by a two man team. The "dredge" man stands and holds the dredge while it sucks up material. In order to stand upright the dredge man will need 40 to 50 pounds of weight on his belt and he also will carry weights on his feet. The second man, known as the "pick-up" man, lies nearly flat on his stomach and guides the dredge intake. He usually carries about 30 pounds of weights. In addition he removes rocks too large for the intake and uses the tools to help clean out the crevices. He also moves rocks downstream and away from the mining operation, usually in a pail or large can. When mining an area, the work should progress upstream so that the divers will not be working in their own discarded tailings. Jet dredges are particularly good for removing overburden while at the same time recovering any contained values. A 6-inch dredge can handle between 12 and 16 cubic yards per hour. If a considerable amount of overburden must be removed in order to mine the bedrock, great care must be exercised to see that the walls of the excavation are not too steep because of the danger of caving. The dredge man should act as a lookout when working in these excavations.

The jet dredge should be held nearly horizontal when mining so that the gold will stay in the riffles. When the riffles are full, the dredge is upended, turned over, and the riffle box emptied into a special container for concentrates. This can be done either under water or on shore. At the end of the day the jet dredge concentrates are cleaned up with the miner's pan.

Experience and equipment needed

Mr. Clark, in his article in the Mineral Information Service on skin diving in California, discusses safety measures and equipment needed, which factors are also pertinent to Oregon conditions.

Certain safety rules and precautions must be observed when diving for gold, and such factors must have first consideration. A person should never dive alone. He should have sufficient diving experience so that he can handle himself in the various situations and hazards that are encountered in mountain streams. He should have a thorough understanding of the use and the limitations of his equipment. Hazards that may be encountered include swift and treacherous currents, snags, floating debris, shifting rocks, and chilling water temperatures. In addition many of the places where skin diving for gold is done are in isolated areas far from help.

Usually there are no decompression problems because diving depths rarely exceed 30 feet, and no time limit exists for diving at these shallow depths. However, dives of any duration below 30 feet require careful planning and time allowances for decompression. For example, it is necessary to allow 13 minutes at 20 feet and 16 minutes at 10 feet for decompression after 2 hours of work at 70 feet. A person lacking experience should attend a diving school. These schools offer instruction in diving and breathing techniques, care and use of equipment, emergency procedures, and first aid. A first-aid kit should be taken on any diving trip.

Because of the great amount of exertion in skin diving for gold and the chilling water temperatures, the diver should be in reasonably good health. Those who suffer from chronic bronchitis, asthma, cardiac conditions, ear trouble or have a perforated ear drum should refrain from diving. Persons with colds or sinus trouble, should not dive until they have recovered their health. Ear plugs should never be used while diving with SCUBA. The diver should adhere to a high protein diet and avoid heavy gas-forming food and alcoholic beverages. Cuts and bruises should receive proper treatment....

The equipment used in skin diving for gold varies considerably. The occasional or beginning underwater miner may be equipped with only a snorkel and miner's pan while others have compressors, floating suction dredges, or underwater gold recovering equipment. The outlay for equipment ranges from less than $50 to as much as several thousand dollars. Because it is usually necessary to hike over steep trails or climb down steep banks to reach the streams, durable lightweight equipment that can be carried by two men is most satisfactory.

Several experienced skin divers have recommended the following as the minimum equipment necessary for the beginner in skin diving for gold: snorkel, face mask, weighted belt, fins, gold pan, and crevicing tool. Although a diving suit is not absolutely necessary, the low water temperatures of most streams make it difficult to do much work without one.

There are two types of rubber diving suits: the "dry" and "wet" suits. Dry suits prevent the water from having any contact with the body as all points are sealed. These usually are used only in extremely cold water. Wet suits are the most popular. They are close fitting but allow a little water to penetrate which is warmed by the body and serves as an insulating layer between the suits and the body. Gloves commonly are worn, the most practical being those with separate thumbs and forefingers. Fins are worn when prospecting where a large area is to be covered and much movement is required. Canvas shoes are usually worn when standing or working in a small area. The amount of weight required varies with the individual and should be sufficient to keep him on the bottom. All weighted belts have quick releases so they can be discarded in cases of emergency.

The more experienced and serious divers use self-contained underwater breathing apparatus or SCUBA. This consists essentially of a mouthpiece for breathing, an air regulator, and an air supply. The regulator, on the diver's back, automatically feeds the air to the diver and releases air only as needed at a pressure identical to that of the surrounding water. The source of air supply is a high-pressure cylinder carried on the diver's back.

When a more permanent air supply is desired, an air hose is connected with a low-pressure air compressor on the surface. The air compressor and air lines connected to the diver are collectively known as a "hookah". Hookahs are used in the majority of underwater mining operations. Diaphragm-type compressors are used and are usually operated by a 1½-2 horsepower, 1-cylinder, self-lubricating, portable motor using regular gasoline. These supply air to two divers, the normal amount of air required for two divers being 4 cubic feet per minute. Fuel consumption is about 1 gallon per horsepower per 8 hours.

Piston-type air compressors such as those used for pneumatic tools should never be used as a source of air in diving because of the danger of poisoning from oil fumes. The compressor discharges to a 1- to 1½-cubic foot floating receiver or reserve tank that is connected to the diver's air line. The reserve tank allows the air to cool and acts as a receiver for the air supply. This is a safety measure in case the compressor motor stops suddenly; the diver's air isn't cut off immediately, and he has time to surface. The rubber air hose is ¼- to 3/8-inch in diameter. The compressor is either on shore, or mounted on a float which follows the divers around as they work under water....

One of the more popular and successful items of equipment is an underwater gold saver known as a jet dredge or a "sucker". This is a pipe-like device curved at one end. Most models are 6 to 8 feet long and weigh around 20 pounds. The nozzle ranges from 2 to 12 inches in diameter. The jet dredge is made of galvanized sheet metal or occasionally of plastic or spun glass. The curved end is the nozzle or intake and is composed of stainless steel or some other abrasion-resistant material. At its upper end the head is connected with a valve to a hose that in turn is connected to a motor-driven water pump at the surface. Water under pressure is fed through the hose to the head. As the water is injected, a vacuum is created at the mouth which sucks in and blows out toward the discharge end.

The lighter material is ejected from the discharge end, but the heavier material drops into a small riffle box near the discharge end. Riffle boxes are 6 to 12 inches long, and the riffles are 1 to 2 inches deep. The water pump motor is gasoline driven and ranges from 6 to 10 horsepower. Water hoses range 1½ to 2½ inches in diameter depending upon the size of the sucker. The hose is usually made of flexible heavy rubber. Some skin diving operations are conducted from

Local Suppliers and Diving Schools

EQUIPMENT SUPPLIERS (LOCAL):

Amerman's Divers' Supplies
7312 S. E. 82nd Avenue
Portland, Oregon

Atomic Sales
1218 "M" Street
Sweet Home, Oregon

Cameo Swimming Pools, Inc
9415 S. W. Canyon Road
Portland, Oregon

Diver's Air & Equipment Company
4867 N. E. Union Avenue
Portland, Oregon

Foster Sporting Goods
Foster Road at S. E. 79th Avenue
Portland, Oregon

Freeway Sporting Goods, Inc.
N. E. 81st Avenue at Halsey
Portland, Oregon

Gold Coast Diver's Supply
P. O. Box 418
Barview, Oregon

Lowell's Skin Diving Supplies
3139 Pacific
Forest Grove, Oregon

Marine Mining & Manufacturing, Inc.
1115 Molalla Avenue
Oregon City, Oregon

Pollocks Marina
70 Highway 99
Grants Pass, Oregon

Reese Marine Center
200 North Main Street
Phoenix, Oregon

Sauter Spray Eauipment Company
2903 S. E. Milwaukie Avenue
Portland, Oregon

EQUIPMENT SUPPLIERS (OUT OF STATE):

Aqua Shop
1317 - 20th Street
Sacramento, California

Gold Divers
3534 W. Rosecrans Avenue
Hawthorne, California

Fuller's Diver's Supply
415 Garden Highway
Yuba City, California

Lawrence Phillips
5937 Walnut Drive
Eureka, California

Lusk Dredge Company
P. O. Box 17
North San Juan, California

Powermite Drill & Tool Company
P. O. Box 1131
Ontario, California

Surf Shop
2686 Great Highway
San Francisco, California

The Nugget Farm
5213 Green Valley Road
Placerville, California

SCHOOLS:

Pacific College of Sport Diving
3727 S. E. Kelly
Portland 2, Oregon

small floating dredges equipped with suction pumps and sluices.

A very useful device for prospecting and especially for those who do not have dredge equipment is a large syringe known as a gold sniffer. This can be made from a grease gun, the best type being that which unscrews on the front or nozzle end. Some are made of transparent plastic. Crevicing tools include large spoons, knives, screw drivers, crowbars, and special types now on the market. Other useful equipment includes small bags attached to the diver's belts for nuggets, prospector's pick, hand magnifying glass for inspecting small gold particles, tweezers, gold scales, and bottles or vials for storing the gold.

Rules and regulations

The skin diver looking for gold should acquaint himself with the many rules and regulations concerned with placer mineral rights, prospecting and mining operations, and ownership and sales of gold. The Fifty-first Legislative Assembly has just passed a placer mining law which is abstracted below:

....Any individual, a citizen of the United States, or one who has declared his intention to become such, who discovers a placer deposit of minerals upon the unappropriated public domain of the United States within this state, which minerals are subject to location under the mineral and mining laws of the United States, may locate a placer claim thereon by posting in a conspicuous place thereon a notice of such discovery and location. The notice shall contain:

(1) The name of the claim.
(2) The name of the individual or individuals locating the claim.
(3) The date of the location of the claim.
(4) The number of feet or acres claimed, together with a description, either by legal subdivisions, if practicable, or if not, then by reference to some natural object or permanent monument in the vicinity of the claim, which will identify the claim located.

....Unless the claim for placer deposit...is located by legal subdivisions, the surface boundaries of the claim must be marked so that the same may be readily traced. Such boundaries shall be marked within 30 days after the posting of the notice...by substantial posts or other monuments of the same size, materials and dimensions as in the case of quartz claims. The boundaries of the claim shall be marked at each corner or angle, and, when any side or end of the claim extends for more than 1,320 feet without a corner or angle, then at intervals of not less than 1,320 feet along such side or end.

....Where the claim for placer deposit...is taken by legal subdivisions, no other reference in the notice of claim required to be posted and filed...than to the legal subdivisions shall be required and the boundaries of a claim so located and described need not be staked or monumented. The description by legal subdivisions in the notice...shall be deemed the equivalent of marking the surface boundaries of the claim.

....Within 60 days after the date of the posting of the notice of location,...the individual locating the claim shall cause to be excavated an open cut upon the claim, removing from the cut not less than five cubic yards of material, and, if practicable, exposing thereby the placer deposit described by such notice. The individual locating the claim, the individual making the cut or any person who worked upon the excavation who has knowledge of the facts relating thereto, shall make and attach to the copy of the notice...an affidavit showing compliance with the provisions of this section.

....The individual locating a placer deposit shall, within 60 days from the posting of the location notice upon the claim, file for record with the recorder of conveyances, if there is one, otherwise with the clerk of the county where the claim is situated, a copy of the notice posted by him upon the claim, together with the affidavit of excavation....The fee for filing such location notice shall be the same as required by ORS 517.030 for recording location notices of mineral-bearing rock claims. The recorder or clerk, as the case may be, shall immediately record the location notice and affidavit annexed thereto in a book kept by him for that purpose. No placer location notices shall be entitled to record or be recorded until the work required...has been done and the affidavit in proof thereof is attached to the notice to be recorded.

In many instances the determination of the status of the stream bed is difficult. The following information supplied by the Lands Officer of the Bureau of Land Management may be helpful in this respect:

Beds of navigable waters are subject to laws of the State in which they are situated and they are, therefore, not subject to location under the United States mining laws. Title to the beds of meandered nonnavigable streams is in the riparian owner. The beds of unmeandered nonnavigable streams are subject to location under the United States mining laws if they are unoccupied, as are also the beds of meandered nonnavigable streams where the abutting upland is still owned by the United States.

Where the abutting lands of meandered nonnavigable streams or lakes have been withdrawn for power site purposes, and those abutting lands are owned by the United States, the bed of the stream or lake and abutting uplands are open for location under the United States mining laws, and have been open since August 11, 1955. There are, however, special requirements about which the locator of such claim should know before beginning mining operations on such a location, otherwise, he may find that his mining operation is in trespass.

Further references are in 43 Code of Federal Regulations 185.172 - .186, published in Bureau of Land Management Department of Interior Circular 2007.

The title to the beds of all navigable streams within the state is vested in the State of Oregon and is under the administration of the State Land Board. In addition, the title to the beds of all streams, either navigable or nonnavigable, affected by the ebb and flow of the tide is vested in the state. Prospectors interested in such lands should write to the State Land Board in the State Capitol Building, Salem, for leasing information.

Since a considerable proportion of the beds of gold-bearing streams in the state are already held by mining claimants, it becomes important for the prospector, even if he wants to do "just a little skin diving", to ascertain carefully what the ownership is. Local inquiry will help in this respect since residents living in the immediate area are usually well informed about claims nearby. Unpatented mining claims in good standing are fairly easy to identify because of the annual labor which must be performed on them. An examination of the mining records in the court house of the county in which the claim is located should also show a recording of an annual "Proof of Labor" affidavit for each claim held. Patented claims are usually on the county tax rolls, and information as to their location is generally available from the county assessor's office. Information on patented claims can also be obtained from the U. S. Bureau of Land Management, 809 N. E. 6th Avenue, Portland 12, Oregon.

In some instances it might be possible for the casual "week end" skin diver to make an informal arrangement with a claim owner to do some prospecting on his claim. It is not mandatory for a skin diver to locate a claim on unappropriated or "open" ground, but failure to do this might result in location of the ground by a second party. Certain state and federal agencies have regulatory powers in connection with water and fish life in Oregon streams. In most cases the activities of the skin diver will in no way affect the stream, and restrictive regulations would not apply. It is conceivable that some fairly intensive placering methods employed in connection with skin diving might be contrary to existing rules and regulations. Operations which seriously disturb the bed of a stream, muddy the water, or introduce toxic materials would be objectionable. Agencies having regulatory powers include the State Fish Commission, State Game Commission, State Sanitary Authority, and the U. S. Fish and Wildlife Service.

Markets for placer gold - regulations

Natural gold may be held, bought, sold, and transported within the United States without the necessity of obtaining a government license. Natural gold is defined by the Treasury as gold recovered from natural sources that has not been melted, smelted, or refined or otherwise treated by heating or by a chemical or electrical process. Thus the only gold which would come under the Treasury definition and which may be bought and sold in this country without any strings attached is metallic gold obtained from a natural source by mechanical means only -- that is, by such methods as sorting, washing, sluicing, screening, and tabling.

Gold obtained in the form of sponge, which results from retorting gold amalgamated with mercury, may be held and transported without a license by the person retorting the amalgam, provided that the person shall hold at any one time an amount not in excess of 200 troy ounces of fine gold. The person holding such gold may dispose of it only to the United States mint or to a person holding the proper government license. Care should be taken during the retorting not to melt the sponge, since this would remove it from the natural gold classification. Also, extreme care should be taken to breathe none of the fumes coming from retorting of amalgam, because mercury vapors are highly toxic.

IS IT GOLD?	PHYSICAL PROPERTIES OF GOLD
The positive identification of placer gold is of prime importance to a prospector. Gold is a heavy mineral and will hang back in a pan. Shiny flakes of mica, often mistaken for gold, are easily washed away. Flour gold may also be lost, particularly if any greasy film is present on the water. Gold is soft, and may be cut or flattened easily with a knife blade. Placer gold is usually yellow but may not shine like polished jeweler's gold. Gold is commonly mistaken for either mica or pyrite, neither of which leaves a golden trace on a streak plate. Pyrite is brittle, has a black streak and is attacked by nitric acid. Gold is soluble only in aqua regia.	Specific gravity: 15 - 19 Hardness: 2.5 - 3.0 Malleable and ductile Color: pale to silvery yellow Streak: pale yellow Lustre: metallic

Prospectors wishing to sell placer gold may take it to the following places: the Grants Pass branch of The United States National Bank of Portland buys small quantities of placer gold outright. The First National Bank of Oregon, Grants Pass Branch, and the Southern Oregon State Bank will ship gold to the mint on consignment. A small service charge is made for handling and shipping. The Baker and Medford branches of the United States National Bank will also accept gold for shipment to the mint. Palmer Brothers Jewelry Store in Baker has a gold purchasing and melting license and will buy placer gold outright. In the Portland area, small quantities of placer gold are purchased by the Montana Assay Office, 610 S. W. Second Ave., or by licensed "gold buyers". Prospectors having several ounces of gold to sell at one time should send it directly to the United States Mint, U. S. Mint Building, San Francisco, California.

Much confusion exists about the system of weights and measures used for gold. There are two methods for reporting the purity of gold. Gold used for industry and in the arts is commonly alloyed with other metals to impart certain special characteristics, and the proportion is expressed in karats. Pure gold is 24 karat, while metal containing 50 percent by weight in gold would be 12 karat. For monetary purposes a different system with a fineness number is used. Pure gold under this system is said to be "1000 fine", which would be equivalent to 24 karat gold. Both placer and lode gold contain certain percentages of alloying metals, usually silver, and the fineness is determined by means of the standard fire assay. The fineness of placer gold varies widely from place to place in the state, but an overall average would be about 850 to 900.

Precious metals are weighed with the troy system rather than the familiar avoirdupois. A troy ounce weighs 31.103 grams, while an avoirdupois ounce weighs 28.349 grams. A troy pennyweight is one-twentieth of a troy ounce.

The government-controlled price for gold is $35 per troy ounce 1000 fine. Since newly mined and untreated gold always contains a certain amount of silver and other impurities, the full price is never paid. In actual practice, small lots of placer gold sold to buyers other than the mint are discounted about one-third. Fair-sized nuggets are often sold to collectors and others for prices considerably above the intrinsic value of the contained gold.

Prospectors working streams in southwestern Oregon should not overlook the possibility that platinum-group metals may also be found associated with placer gold. Currently platinum is worth about $82 an ounce. Concentrates containing platinum-group metals can be sold to Wildberg Bros. Smelting & Refining Co., 742 Market St., San Francisco.

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OREGON OFFICIALS TAKE NEW POSITIONS

Earl S. Mollard, who has been general manager of both the Hanna Nickel Smelting Company and The Hanna Mining Operation at Riddle, Oregon, has been made vice president in charge of operations, The Hanna Mining Company, Cleveland, Ohio. Mr. Mollard has been with the Hanna organization for more than 25 years and at Riddle since 1952, when the company began its operations in Oregon. He has been succeeded by Emmons E. Coleman, formerly manager at the Hanna Nickel Smelting Company at Riddle.

Stephen Yih, formerly general manager of the Albany division of Wah Chang Corporation, has been transferred to New York to become president of the company. He has been succeeded by Douglas A. Fairgrieve, who was sales manager with the Albany division since joining the company in 1957.

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TWO MINERAL COLLECTIONS ON DISPLAY

Two very fine loan exhibits are now on display for a short time in the department's new built-in wall cases at the Portland office. One exhibit was loaned by the Willamette Agate and Mineral Society of Salem, and was arranged by Mrs. V. E. Glass, secretary of the society. This exhibit consists of an interesting variety of high-quality minerals, crystals, and agate material from various parts of the United States and Mexico. The other is a remarkable collection of native copper and copper minerals loaned by Leo Simon of Portland. In this colorful array are more than 30 different copper minerals, many of them exceedingly rare.

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BRISTOL NAMED TO BOARD

Fayette I. Bristol, Grants Pass, was appointed to the Governing Board of the Department of Geology and Mineral Industries by Governor Mark O. Hatfield on April 1, 1961, and received Senate confirmation on April 12. Bristol, who is president of Bristol Silica Company, replaces Earl S. Mollard, general manager - Oregon, The Hanna Mining Company, Riddle, Oregon, who resigned April 1 because of his transferal to Hanna's head office in Cleveland, Ohio. Bristol, a former State Representative, brings a wealth of mining experience in Oregon to the board. He is presently Chairman of the Western Governors Mining Advisory Council and President of the Oregon Mining Association. Bristol mined chrome during the stockpile program and has been president and owner of Bristol Silica Company, producers of high-quality silica, since its founding in 1932.

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LAKEVIEW URANIUM NEWS

Lake County Examiner reports that the Lakeview Mining Company's uranium mill at Lakeview, Oregon, was purchased March 27 by Kermac Nuclear Fuels Corporation, a subsidiary of Kerr-McGee Oil Industries, Inc., of Oklahoma. The Oklahoma firm also purchased a similar uranium mill owned by the Gunnison Mining Company at Gunnison, Colorado. According to D. A. McGee, president of the Kerr-McGee Oil Industries, Inc., operations of the Lakeview mill will be conducted as the Lakeview division of the Gunnison Mining Company. Both mills have contracts with the Atomic Energy Commission to produce uranium oxide. Lakeview's present contract runs through November, 1963. After expiration of the AEC contracts, it is the intention of the new owners to make use of the processing plants for treating and concentrating raw materials other than uranium.

Vance Thornburg of Grand Junction, Colorado, who holds a lease on the White King Uranium mine near Lakeview, has begun pumping water out of the large open pit. The White King first produced uranium ore from underground workings in 1955 but mining difficulties early in 1959 resulted in a switch to open-pit operation. The mine has been idle for the past year and Lakeview Mining Company gave up its lease last fall. The mine owners, Mr. and Mrs. Tracy, John and Wayland Roush, Walter Leehmann, Sr., and Walter Leehmann, Jr., subsequently leased the property to Thornburg last October.

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OME ADDS MINERALS TO EXPLORATION ASSISTANCE LIST

The Office of Minerals Exploration announced on March 28 that it proposed to add gold, silver, bismuth, sulphur, tellurium, and iron ore to the list of minerals for which exploration assistance is given. OME also plans to increase its present maximum participation percentage from 50 to 75 percent for certain commodities. Minerals for which the government will pay 75 percent of the exploration cost are: asbestos, bauxite, beryllium, chromite, columbium, corundum, diamond (industrial), graphite (crucible flake), kyanite (strategic), manganese, mercury, mica (strategic), nickel, platinum group metals, quartz (piezoelectric), talc (block steatite), tantalum, and tin. Minerals eligible for 50 percent cost contributions are: antimony, bismuth, cadmium, cobalt, copper, fluorspar, gold, iron ore, lead, molybdenum, monazite, rare earths, rutile, selenium, silver, sulphur, tellurium, thorium, uranium, and zinc. Further information may be obtained from the Office of Minerals Exploration, Department of the Interior, Region I, South 157 Howard Street, Spokane 4, Washington.

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BIG PIPELINE PROJECT WELL UNDER WAY IN OREGON

Construction on the 36-inch pipeline connecting gas from Alberta, Canada, to users in the San Francisco Bay area of California has progressed rapidly since the first of the year. At the date of this printing, pipe has been installed from the California line to a point north of the town of Chiloquin, Oregon, a distance of approximately 50 miles. About 30 miles of ditch is opened beyond the installed pipe. In the Madras-Hermiston section about 75 miles of rough trench is opened, mostly through hard rock.

The 1400-mile Alberta to California pipeline project was sponsored by the Pacific Gas and Electric Company of California and, when installed, will be the longest 36-inch pipeline ever laid. Total estimated cost of the system will amount to over $300 million. The main line begins at the Whitecourt gas fields in Alberta and terminates at Antioch in the Sacramento River delta area east of San Francisco. Cost of gas at delivery point will be 35 cents per 1000 cubic feet. Besides supplying northern California, a portion of the gas will be allotted to the El Paso Natural Gas Company, which is the supplier for the northwestern states. El Paso Natural Gas Company will have a main-delivery-tap in the line near Spokane, Washington, and a standby-tie at Stanfield, Oregon, where gas can be taken off the Alberta-California pipeline and transferred to the Oregon-Four Corners pipeline. Taps into the new line will be made at Madras, Redmond, Bend, and Klamath Falls when demand is sufficient to warrant installation of distributing systems.

An outstanding feature on the pipeline construction project is the use of "field plants" at places along the route. Forty-foot lengths of pipe are welded together in "doubles" at these plants and are then coated inside and out with corrosion-resistant material. This assembly process shortens considerably the time in laying pipe in the trench. Cost savings up to 15 percent in construction are reported by the use of assembly plants. Two of these field plants were located in Oregon when construction on the pipeline began in December, 1960, one at Madras and the other at Sprague River. Each plant employs 85 men who coat and double-joint the pipe. As construction progresses, the field plants can be moved to central locations along the route from which they prepare pipe for another 200-mile stretch.

References

Personal communication: Mr. R. S. Nabors, general superintendent, Pacific Gas Transmission Company, Spokane, Washington.

Alberta-California Gas Pipeline System: Oil and Gas Journal, March 13, 1961, vol. 59, no. 11.

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WELL RECORDS RELEASED FROM THE CONFIDENTIAL FILES

The following well records were released as public information by the department on April 4, 1961, after being held as confidential for a two-year period as prescribed by law:

V. V. Erntson	Schermacher No. 1 Marion County	NE¼ sec. 27, T. 9S., R. 2W.	2426' T. D.	Electric Log Driller's Log
Sunnyvale Oil Co., Inc.	Federal-Mitchell No. 1 Grant County	SE¼ Sec. 14, T. 16S., R. 29E.	1168' T.D.	Geologist's description of cutting & cores.

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