

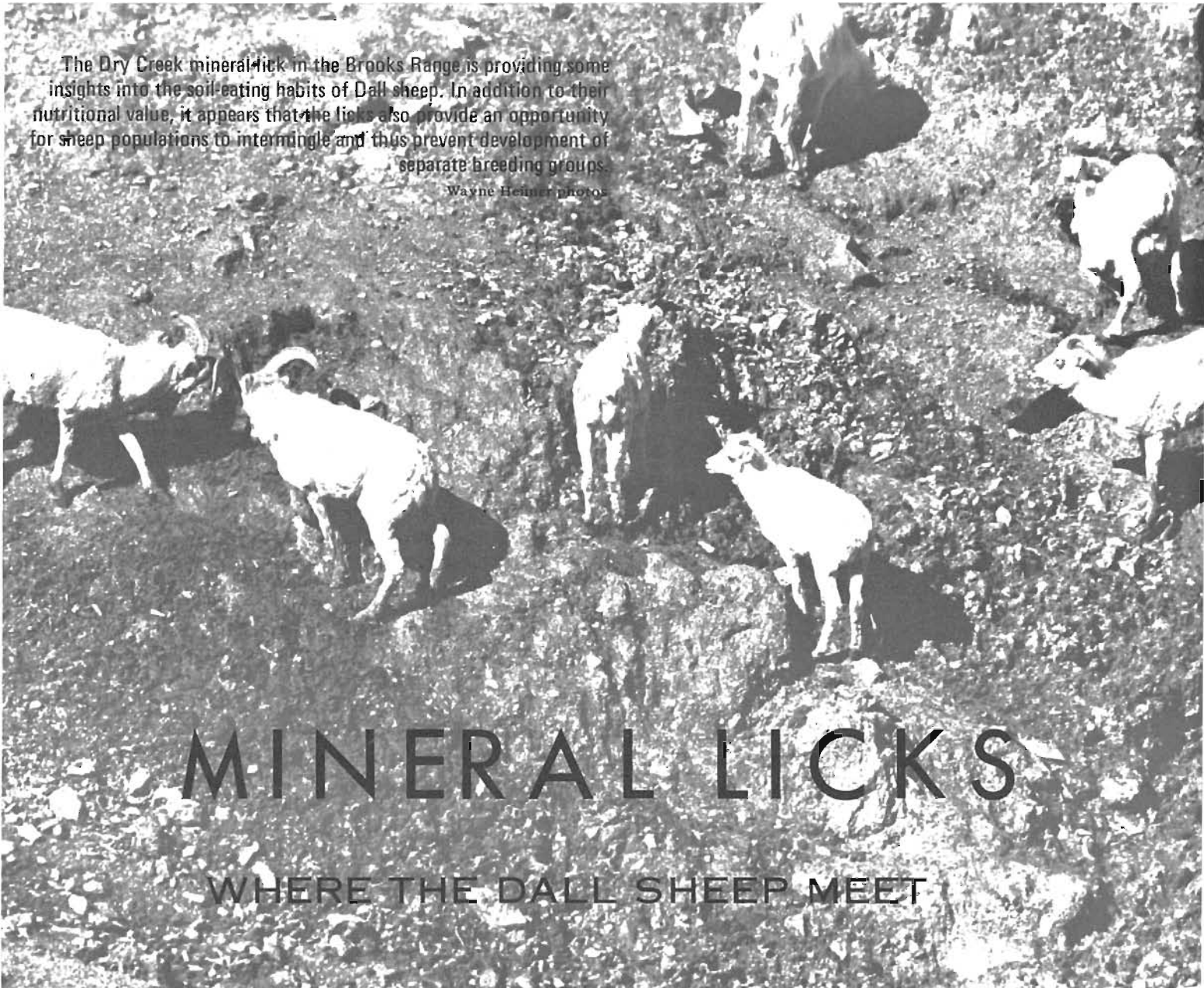
By Wayne E. Heimer  
Game Biologist  
Fairbanks

IT APPEARS THAT nearly all populations of Dall sheep in Alaska have favored spots where they eat the soil. These sites are called mineral licks. Mineral licks often occur along geological fault lines and consist of mineralized earth which often contains concentrations of sulfides associated with decomposing rock. Sheep either lick the rocks or in some cases actually consume the soil.

The main mineral lick on Dry Creek in the Alaska Range is of the latter type. The soil there is a very fine clay which contains products of decomposing rock and enough water to make it quite slick and pasty.

The Dry Creek mineral lick in the Brooks Range is providing some insights into the soil-eating habits of Dall sheep. In addition to their nutritional value, it appears that the licks also provide an opportunity for sheep populations to intermingle and thus prevent development of separate breeding groups.

Wayne Heimer photos



# MINERAL LICKS

WHERE THE DALL SHEEP MEET



*SHEEP TRAP—Department of Fish and Game employes blindfold Dall sheep caught in net at Dry Creek mineral lick. Blindfold calms sheep, helps prevent injury. L, Bob Piorkowski; r, Mark Lenarz.*

Heavy hunting pressure in the Alaska Range has prompted the Alaska Department of Fish and Game to study sheep at this major lick for the last five years. In the early years of the study, sheep were trapped by a drop net as they ate the soil. A total of 268 animals were marked. After the trapped sheep were marked with collars, the movements and frequency of visits to the lick by marked animals and other sheep were noted. Observers stationed in around-the-clock shifts in a camouflaged blind about 200 yards from the lick recorded these sheep activities.

This project has shown that in Dry Creek there are at least two populations of ewe sheep which seldom mix except at the lick. The lick is part of the home range of both populations and is usually visited in early summer. After lambing time, the sheep visit the lick while traveling from their wintering grounds to summer ranges further up the valley. All age classes of sheep, including mature rams, come to the lick. Some sprint the last 200 to 300 yards to the lick and immediately begin eating.

Lick use by sheep seems to follow a predictable pattern. Most sheep come to the lick within a 10-day to two-week period in early summer. During this time it is not unusual to see 500 sheep entering the lick in a single day. There is much social interaction at this time and horn clashes over the favorite licking sites are common. After this peak use period, sheep move

to their summer ranges and the lick is used very little until next spring.

We found that a sheep makes an average of four visits to the lick each year, and that most sheep will come to the lick every year at about the same time. Because of sheep loyalty to the lick, the task of determining productivity and survival may become easier for the biologist. In the future it may be possible to spend time at a mineral lick rather than making dangerous survey flights into other areas of the sheep range.

Why do sheep come to the mineral lick? No one really knows, but the best guess is that the licks are socially and nutritionally important. Sheep are animals with strong traditional ties to their home ranges. Therefore, it seems likely that this self-imposed isolation could lead to entirely separate breeding populations. This has not actually happened. Because separate sheep populations have not developed, sheep research biologists now believe that young rams move from one population to another. This could easily happen at licks where populations intermingle. Two-year old rams change home ranges when they leave the bands of ewes and join ram society. When a young ram is ready to leave the ewes, he follows any ram band that he meets. Perhaps mineral licks allow for this exchange of future breeding males by providing for population mixing. *(cont'd on next page)*

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Sheep also may be nutritionally dependent upon licks. Alaska's alpine environments are thought to be low in several minerals which are essential to animal nutrition. Sheep may eat the dirt to get some mineral which is lacking in their normal diet.

Many licks are safe from human interference because of their remoteness but there are licks which stand in the shadow of human development. Sheep at a lick will tolerate human presence to a remarkable degree, but the Dry Creek project has shown that sheep will not tolerate the presence of a tractor operating in the same small drainage which contains the lick. Such a tractor was in Dry Creek because a mining claim which includes the main mineral lick has been filed there. So far, only the assessment work has been done.

Current mining law places no special restrictions for the protection of wildlife on those who develop and use nonrenewable resources. Perhaps a growing ecological awareness will result in mining development being adjusted to the needs of Dall sheep and other species. It is hoped that future developments can be guided in a manner that will enable Alaska's Dall sheep to be assured of mineral licks sufficient to meet their needs. ■

*Wayne E. Heimer was graduated from the University of Northern Colorado with a B.S. degree in biology and chemistry and obtained an M.S. degree in zoology from Washington State University. He attended the University of Alaska, working toward his Ph.D. in zoophysiology, before joining the department in 1971 as a game biologist stationed at Fairbanks.*

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Readers are reminded that Fish Tales and Game Trails is distributed without charge to Alaskan residents who are interested in the fish and wildlife resources of their state. Just drop a note to Information and Education Section, Alaska Department of Fish and Game, Subport Bldg., Juneau, Alaska 99801, and your name will be placed on the mailing list.

# FISH BY THE BARREL

EXPERIMENTAL WORK AT FIRE LAKE Hatchery shows that 55-gallon drums can be used to improve fish rearing efficiency in the hatchery. The method was developed by Keen Buss, a biologist with the Pennsylvania Fish Commission, and appears to be a promising technique to increase the indoor rearing capacity at Fire Lake.

Four barrels were set up on an experimental basis, and procedures were based generally on Buss' work. Changes in water flows and fish loads were made as the experimental work progressed.

The maximum weight of fish reared in a barrel has been 52 pounds at an average size of 450 fish per pound. These fish were in good condition and although there was no indication of adverse effects due to overcrowding, it was arbitrarily decided to limit them to 30 pounds per barrel.

At first water was supplied at a rate of five gallons per minute and this was increased gradually up to 10 GPM. At the latter flow, virtually all excrement and excess feed washes out the top and dead fish lodge on the outlet screen and are easily removed. Only occasional brushing of the bottom is required, whereas in conventional troughs and tanks, daily brushing is necessary.

Water has a rolling motion within the barrel and feed not eaten immediately remains suspended so fish have added chances to eat it before it washes out. This is probably the reason for more efficient food utilization observed.

The greatest advantage in using the barrels is in more efficient use of the floor space in the hatchery. A barrel occupies approximately four square feet of floor space and can contain 30 pounds of fish. Our conventional troughs will carry up to 30 pounds of fish, but they occupy 15 square feet of floor space. The larger indoor tanks can carry up to approximately 300 pounds of fish and cover approximately 200 square feet. Forty barrels could be installed in the space now occupied by one of the large tanks, and four times as many fish could be reared in the same floor space.

The primary disadvantage of the barrels is that fish are so dense in them that an interruption of water flow for very short periods can be disastrous, whereas in the large tanks there is a much wider safety margin.

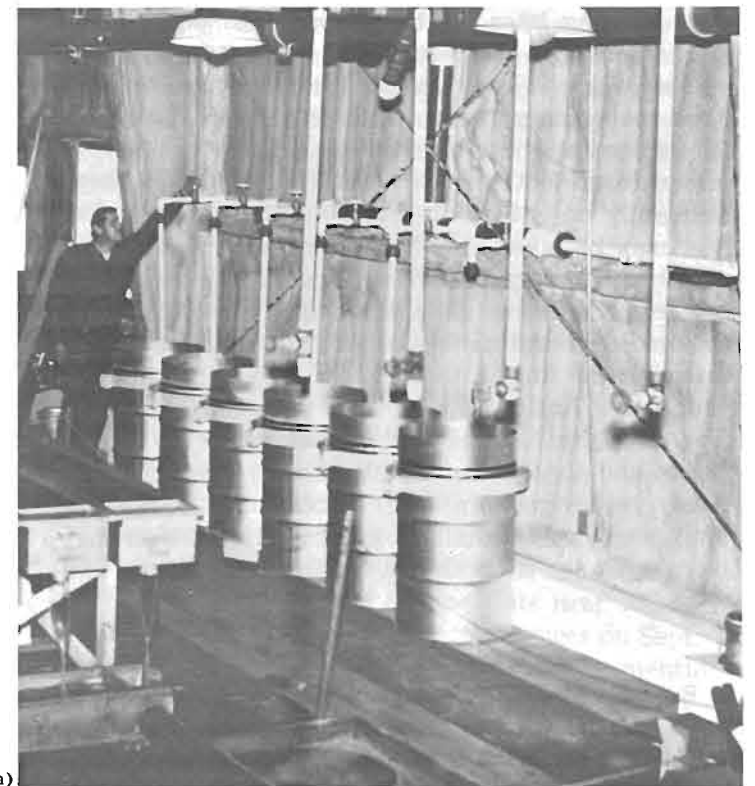
Conventional troughs and tanks are not being rendered obsolete, for they are needed to handle fish in the hatchery, but barrels offer some real advantages, and they are being incorporated into the operation. They are especially valuable for handling small lots of fish for either special or experimental purposes. ■

By Joe Wallis  
Superintendent  
Fire Lake Hatchery

*FISH BARREL—Drums modified for fish rearing promise to improve efficiency of Alaska hatcheries. Drums use less floor space than traditional trays, enable better utilization of feed.*



*FIRE LAKE SYSTEM—Experimental drums share space with tray system at Department of Fish and Game hatchery at Fire Lake near Anchorage.*



*Joe Wallis received his degree in wildlife management from the University of Missouri at Columbia. He began work with the department five years ago as a fishery biologist and presently is superintendent of the hatchery at Eagle River.*

(Photos by Dave Gaither and Bill Rosenbaum)



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