

Thirty Years of Ranch Management and Range Trend

Pete Hill and John Lacey

Pete Hill and the PJ Ranch are excellent examples of how a ranching family uses knowledge, experience, self-interest, and technical assistance gained through the SRM to apply scientific principles of growing grass and raising livestock. After 30 years of ranch management and trend information—they have a message for SRM members.¹

History and Description

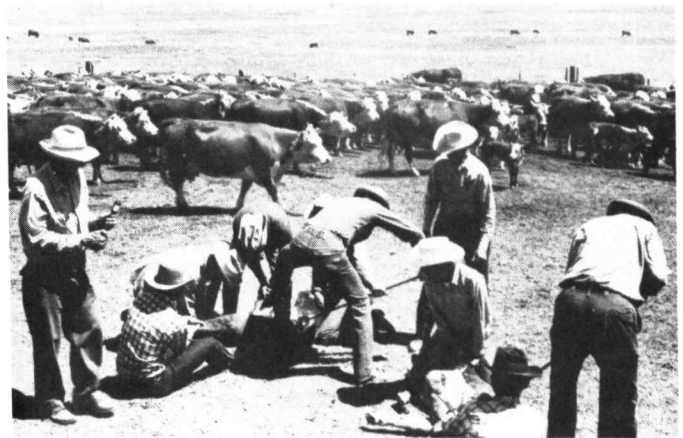
The PJ Ranch is located 15 miles south of Powderville, in the sparsely populated prairie country of southeastern Montana. Its beginnings date back to 1892, when the author's eventual father-in-law, Pete Jensen, went to work for Ferdon and Biddle. During the next 2 years, Jensen recognized that an area on Crow Creek had better grass and less winter snow than any part of the old Box T Ranch that headquartered on the Powder River. When Ferdon and Biddle sold out in 1894—Jensen paid \$300 for "squatter's rights" to the "bull pasture" along Crow Creek.

Jensen spent the next 40 years developing a headquarters and wheatgrass meadows for hay production. He made little progress toward range development until passage of the Taylor Grazing Act in 1934. This legislation made it possible for Jensen to leave some grass and not worry that it would be used by his neighbors, or the itinerant herdsmen.

Pete Hill visited southeastern Montana during the Great Depression era on the trail of a fair lass who had been a student at a university in his home state of Missouri. The trip was successful, and by the time Hill landed on the ranch to stay in 1940, he was Jensen's son-in-law. Since then, the ranch has thrived. It now runs 400 brood cows on 26,880 acres, has no mortgage, and there are a few bucks in the bank.

During the early 1940's, Pete Hill learned that raising cattle in Montana required the same hard work that it did on the livestock farm in Missouri. Hay had to be put up in summer and fed in the winter. However, it was a different ball game and he learned by observation, experience, and a lot by trial and error. Things learned included that "tis much easier on a person, and his clothes too, to wrestle a calf from the top side instead of the bottom."

After 7 years of apprenticeship, Pete was able to find



Pete and neighbors branding on the PJ Ranch, May, 1956.

enough credit to make a down-payment on the PJ Ranch. Now was the time to find a way to somehow make the ranch produce more pounds of beef.

It was a good time for Hill to meet Joe Woolfolk, a range and grass specialist at the U.S. Livestock and Range Research Station at Miles City. Woolfolk was a graduate of the University of Montana School of Forestry, and came from a ranch background. He understood the problems of trying to rebuild a cattle herd while restoring badly damaged range. Not only did they become good friends, but Pete counts the many hours spent together as priceless, and Joe's friendship and good counsel as a "blessing beyond compare." Joe helped Pete answer the question, "Is it better to be a cattleman or a grassman?"

Pete welcomed the idea of a world-wide organization of people interested in the study of forage grasses as a way to improve livestock production. He attended the organizational meeting of the Society for Range Management in Salt Lake City in 1948, became a charter member, and served as president of the Northern Great Plains Section in 1964.

He credits SRM with providing the information—and inspiration—to help him keep faith with the precept "take half, leave half . . . your half will get bigger." Hill combines this philosophy with scientific principles for raising grass and livestock.

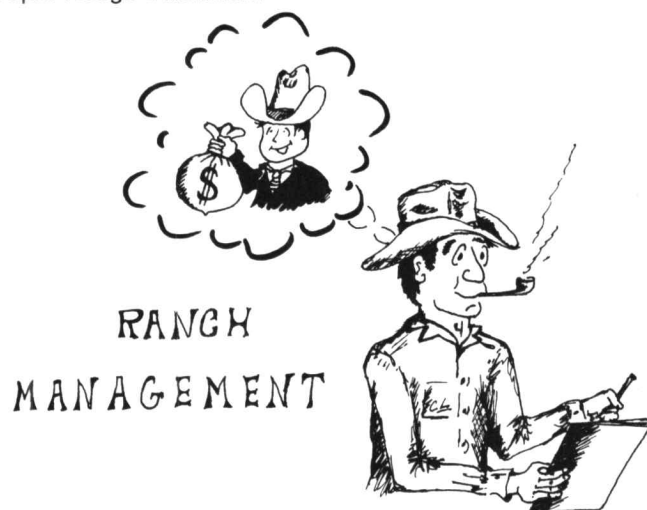
The PJ ranch lies in one of the world's greatest livestock producing regions, the Northern Great Plains. While Hill has title to part of the range, the remainder is administered by the

¹Pete Hill wrote this account of the PJ for presentation at the 36th annual meeting of the Society for Range Management in Albuquerque in 1983. When he was unable to attend the meeting, the presentation was given by John Lacey, "author" of this edited version.

Bureau of Land Management and the state of Montana. The annual precipitation averaged about 14 inches from 1951 through 1982. Temperatures vary from 50 degrees below to 110 degrees above zero. The rolling ridges, coulees, and rock escarpments vary from 2,700 to 3,000 feet in elevation.

Western wheatgrass is, by far, the most important, dense and palatable forage plant. Needle-and-thread, green needle, blue grama, June grass, and buffalo grass also are important. Big sagebrush, and snowberry are common shrubs. The main forbs are prairie coneflower, biscuit root, scurf pea and onion.

Southeastern Montana was heavily grazed by horses, cattle and sheep from the 1890's through the 1930's. Miles City earned its reputation as a "cow town" and the world's No. 1 horse-shipping center. Competitive grazing under the open range conditions denuded many of the ranges of virtually all forage. Fortunately, the Taylor Grazing Act of 1934 provided ways for ranchers to protect and improve their land. Hill, and many other ranchers, learned to use fences, dams, wells, and other ways to improve the distribution of livestock and obtain proper forage utilization.



The PJ ranch has been a commercial cow outfit since 1913, when the last sheep was trailed to Miles City. Until 1965, quality Herefords had been the trademark, and most of the calves were sold as yearlings. However, Hill implemented a crossbreeding program in 1966 using Black Angus-Brown Swiss bulls to improve milk production. Average weights of yearlings were increased nearly 100 pounds. Because of labor constraints, the yearling portion of the operation was terminated in 1970.

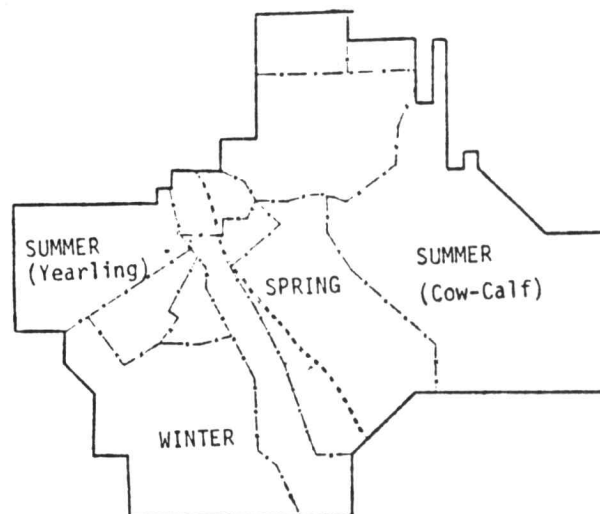
Although cattle graze all year and the PJ range is in cake-and-grass country, Pete feeds about 300 tons of grass-alfalfa hay each winter, or about 1,200 pounds per animal unit (AU). He has had to buy hay only 3 times in 40 years. The cows are given supplemental protein prior to calving, which begins in early April. The steer calves average 450 pounds at weaning, and the replacement heifers are bred to calve as 2-year-olds.

Proper stocking rate is an important part of the PJ management. By observing how the principal forage plants were responding over the years, Pete determined that the carrying capacity was about 480 animal units or 56 acres per AU.

Because the cattle are fed some hay during winter, actual stocking rate is 65 acres of range per non-hay AU. This is a much lighter stocking rate than the 45-acres non-hay AU averaged on other large ranches in the area.

Hill realizes that research at the U.S. Livestock and Range Research Station at Miles City indicates that it may have been possible to obtain more pounds of beef per acre by stocking heavier. The PJ, however, is operated under a conservative philosophy. Rather than relying on intensive inputs, and plunging into debt for expensive machinery and intensive range improvements, changes were made as money became available. Over the years, the inventory of equipment has never included more than two 50-horsepower tractors, a rotary mower, baler, and 2 pickups.

During the 1940s, the Hill family decided its goal was the production of a continuous supply of cattle with a minimum of input expense. Since then they have not diverted any short-term resources to such enterprises as growing wheat, producing alfalfa seed, breeding registered cattle, or investment in expensive haying equipment. In other words, "if you don't know where you are going, you probably won't get there." One pasture—because of sandy soils, south-facing slopes, and easy access—has been used annually for 4 decades for spring grazing. Two pastures were grazed 3 months each summer. A fourth was utilized from September through November. Thus, for 40 years, stocking rate and season of use has remained constant within each pasture. (The figure covers 30 years.)



Seasonal use of pastures on the PJ Ranch from 1950 to 1982.

The conservative philosophy explains why the PJ went through the 1979-1980 drought without having to reduce animal numbers or rent pasture. Because of the overall ranch management program, there is no leafy spurge or knapweed, two weeds prevalent throughout Montana, on the ranch.

Like many good ranchers, Hill wanted to leave the land in better shape than he found it. Rather than trust his memory, he and Joe Woolfolk established permanent vegetation transects in 1953. A cluster of three transects were established in the spring, summer yearling, summer cow-calf and winter pastures. A total of 12 transects were established.



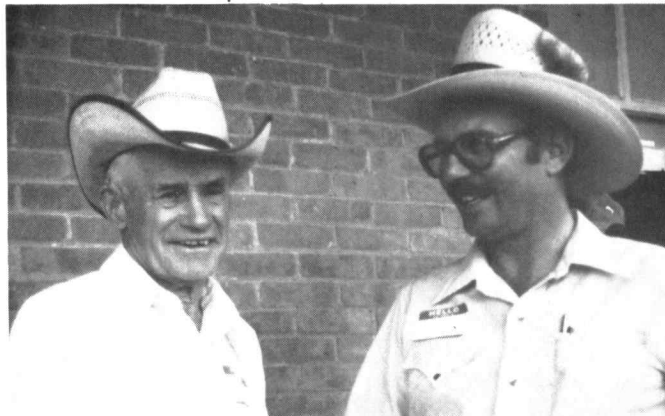
The Parker three-step procedure was used. A 100-foot steel tape was stretched between angle-iron stakes. A three-quarter-inch loop was dropped at one-foot intervals to record hits on soil, litter, rock, or vegetation.



Gene Payne and Pete Hill reading a transect in 1961.

The vegetation species were separated into three groups: desirable, intermediate, and undesirable. Desirable plants included the wheatgrasses, needle grasses, and sedges. Intermediate plants included blue grama and buffalo grass. Undesirable plants included annual bromes, cactus, sagebrush, etc. . . Hits on vegetation were recorded if any portion of the basal area of a grass or forb—or the canopy of a shrub—fell within a loop. Three hundred quadrants were observed in each cluster, and the occurrence of a given group of species within a loop was treated as a binomial

distribution. By calculating the percentage of the total number of plots that a given group of plants either were present or not present, and using a statistical t value of 1.96, it was possible to estimate confidence intervals for the three plant populations. It was concluded that a given group of plants (desirable, intermediate, undesirable) had changed significantly if the confidence intervals for two separate dates did not overlap.



Terry Petersen photo

Pete Hill, left and Larry White, right. Pete Hill of Powderville, Montana was chosen 1983 Rangeland of the Year by the Northern Great Plains Section, SRM, at a meeting held in July, 1983.

The award recognizes Pete Hill for his continued efforts in range improvement and his activities and support of the Range Society. The Society used Hill's 400-head ranch as a study site for some of its activities.

Hill said of the award, "I am pleased and consider it quite an honor to receive this recognition from this group."

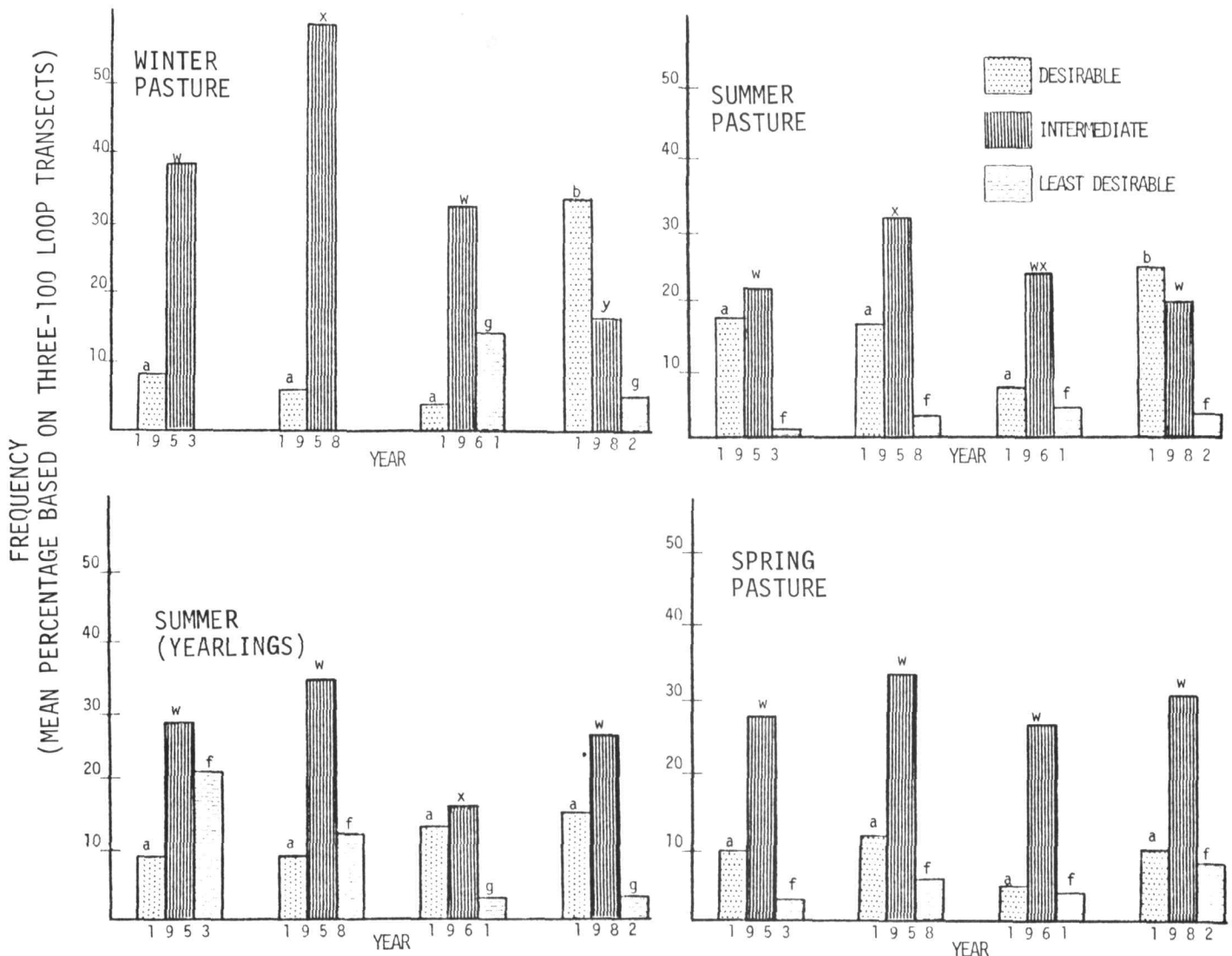
The trend data showed that there had been a significant increase of desirable plants in both the winter and the summer (cow-calf) pastures. Both increases occurred between 1961 and 1982.

Annual precipitation averaged 11.84 inches from 1951 through 1961 and increased to 15.35 inches from 1961 through 1982. Although it seems logical to attribute some of the improvement to the favorable precipitation, some must be attributed to the management practices and conservative stocking rate. The winter pasture had been grazed annually by 300 cows from September through November (5.7 acres per AUM). The summer cow-calf pasture was grazed annually by 300 cows from June through August (8.5 acres per AUM). Both are a more conservative stocking rate than the 3 to 4 acre per AUM that the Soil Conservation Service recommends for the area.

Although there was not a significant increase of desirable plants in the summer (yearling) pasture, there was a significant decrease, (from 20 to 5%) from 1953 through 1961 in the amount of Japanese brome and other undesirable plants. These undesirable plants were replaced by intermediate plants.

There was no evidence of long-term improvement, or long-term decline in range productivity in the spring pasture. From a management standpoint, this seems to suggest that a light stocking rate can offset the detrimental affects of annual spring use in the northern Great Plains.

Researchers should be relieved to know that results from



Above figures show trend in each pasture (clusters) on the Pete Hill Ranch. Loop readings follow the procedure outlined in Step 1 of the 3-Step Method. The letters above the mean number of loop hits within a vegetation group are used to indicate a significant change (95% level of probability) between time periods within a given pasture. For example, in the spring pasture, the letter "a" above the desirable plants within each time period indicates that the desirable plants did not change during the 30 years of spring grazing. If a change had occurred, the "a" above the appropriate column would have been replaced with a "b" (as in the winter pasture).

Editor's Note: Sorry about the long caption—so you can understand what the small letters represent.

Pete's records are consistent with research studies in the Northern Great Plains. In general, mid-grasses have increased, and blue grama and buffalo grass have decreased. Because of the conservative stocking rate, individual animal gains have been higher than on many ranches in eastern Montana. More importantly, the gains were from grass and not from hay or supplemental feed. There was no evidence indicating a downward trend.

Conclusion

The PJ ranch is a perfect example of how a range technician and a rancher can work together. Because of their mutual respect and cooperation—Pete has remained active in the SRM. The Hills (and other ranchers in southeastern Montana) know that range trend is up on the PJ ranch. It seems that more of us younger SRM members should follow the trail that Pete and Joe blazed 35 years ago. Their story is more evidence that ranching and research can work together to further the interests of our Society for Range Management.