Habitat Changes

Mount Haggin Wildlife Management Area

By Michael R. Frisina and Richard B. Keigley

In 1984, after more than 60 years of continuous season-long livestock grazing, a rest-rotation grazing system was established on the Mount Haggin Wildlife Management Area (MHWMA) in southwest Montana (3,4). Prior to implementing the grazing system, a number of photo-monitoring points were established on the MHWMA at locations where cattle concentrate while grazing. A photo essay shows changes observed at photo points in riparian, lowland, and upland sites within the grazing system. Additionally, gross changes in the amount of willow present are documented using aerial photo interpretation.

Mount Haggin Wildlife Management Area

The 55,000-acre MHWMA is located approximately 10 miles southeast of Anaconda, Montana, and is administered by the Montana Department of Fish, Wildlife and Parks (MFWP). The area is a mixture of wet and dry meadow types, grass/shrublands, and forest. Willows are common along numerous stream courses and wide riparian areas enhanced by beaver dams.

During the 1960's willows were directly reduced by spraying, dozing, and hay mowing. Willows were also indirectly reduced due to intensive beaver trapping reducing the number of dams. Willow and beaver were considered hindrances to range forage and hay production for use in raising sheep and cattle.

Lodgepole pine is the most common forest cover type; Engelmann spruce is also present in small populations near riparian areas. A significant portion of the lodgepole pine and spruce on the drier, less precipitous sites has been clearcut and is regenerating. The elevation of MHWMA lands within the rest-rotation grazing system varies from 5,500 ft. to 8,000 ft.; annual precipitation is about 20 inches.

Substantial populations of Rocky Mountain elk and moose inhabit MHWMA. Mule deer and black bear are also common. Small populations of pronghorn antelope and whitetail deer are present during spring, summer, and early fall. Beaver and sandhill cranes are the most common nongame species of general interest. Beaver populations have increased over the past 20 years as a result of conservative harvest quotas. Response of elk to the rest-rotation grazing system was described by Frisina (4) and sandhill cranes by Frisina and Canfield (5). The effect of an expanding moose population on the willow community was addressed by Keigley et al. (10), Keigley et al. (11), and Keigley et al. (12). The response of small mammal populations to the different grazing treatments provided by the grazing system was described by Douglass and Frisina (1).

Rest-Rotation Grazing System

The Mount Haggin grazing system consists of a three pasture rest-rotation system incorporating approximately 20,000 acres using a design based on principles described by Hormay (6) and Egan (2) (Figure 1). August L. Hormay consulted with MFWP to design the grazing system. The three pastures vary in size from about 6,000 acres to 8,000 acres. They are approximately equal in livestock

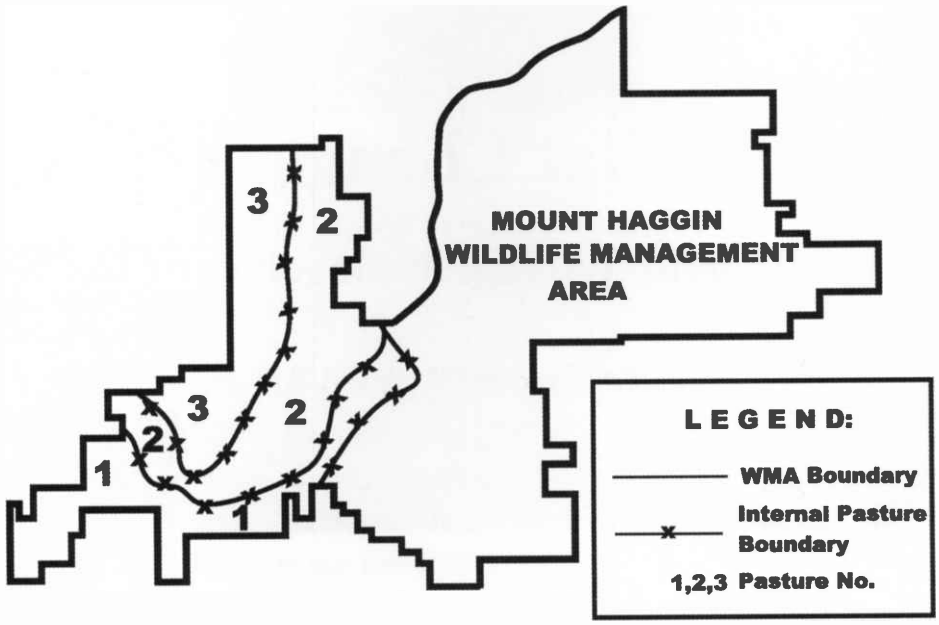

Figure 1. ***The Mount Haggin Wildlife Management Area rest-rotation grazing system consists of three pastures.***

grazing capacity and are fenced off from each other. Fencing allows for cattle control, but does not significantly inhibit movements of free ranging elk and other large wild ungulates.

The annual grazing season begins in mid-June and ends on October 15. The allowed grazing level is set at 4,000 Animal Unit Months (AUMs) annually. In a particular year, the livestock operator may graze fewer cattle than allowed, but may not exceed the 4,000 AUMs. Numbers of elk, moose, and deer within the grazing system are controlled by regulated hunting (7,8).

Each of the three pastures receives one of the following three grazing treatments annually (Figure 2):

A Treatment – Pasture is available for cattle grazing throughout the entire grazing season but is primarily grazed during the growing season. This pasture is also available to free-ranging wildlife. When seeds are ripe on pasture vegetation (seedripe), cows and calves are moved to the pasture scheduled for the B treatment; in some years bulls are left behind in the A treatment pasture until they are removed from the area.

B Treatment – Cows and calves are moved to the B treatment pasture near the end of the growing season, at seedripe time. Cattle remain in the B treatment pasture until the end of the grazing season.

C Treatment – Rested from livestock grazing for the entire year and available for free-ranging wildlife use only.

Each pasture receives one treatment annually. In effect, cattle graze two-thirds of the system during a single grazing season, but only one-third is grazed during a single growing season. Following grazing of a pasture by cattle during the growing season (A treatment), that pasture is rested from livestock grazing for the next two growing seasons (by following the A treatment with the B and C treatments, respectively) (Figure 2).

The rationale for this approach is as follows: The B and C treatments provide vegetative rest, which maintains maximum plant vigor and food storage, and enables plant seedlings to become established by allowing a full year for them to develop a root system prior to potentially being grazed by cattle.

Since the system allows for plants to fully complete their above-ground biological life cycle two out of every three years without being grazed, the system encourages plant diversity and growth of new vegetation in bare soil areas (6,2). B treatment pastures are not grazed until seeds are developed on the slowest maturing plants (mid-August). The slowest maturing important plant at the MHWMA was determined to be bluebunch wheatgrass. Using

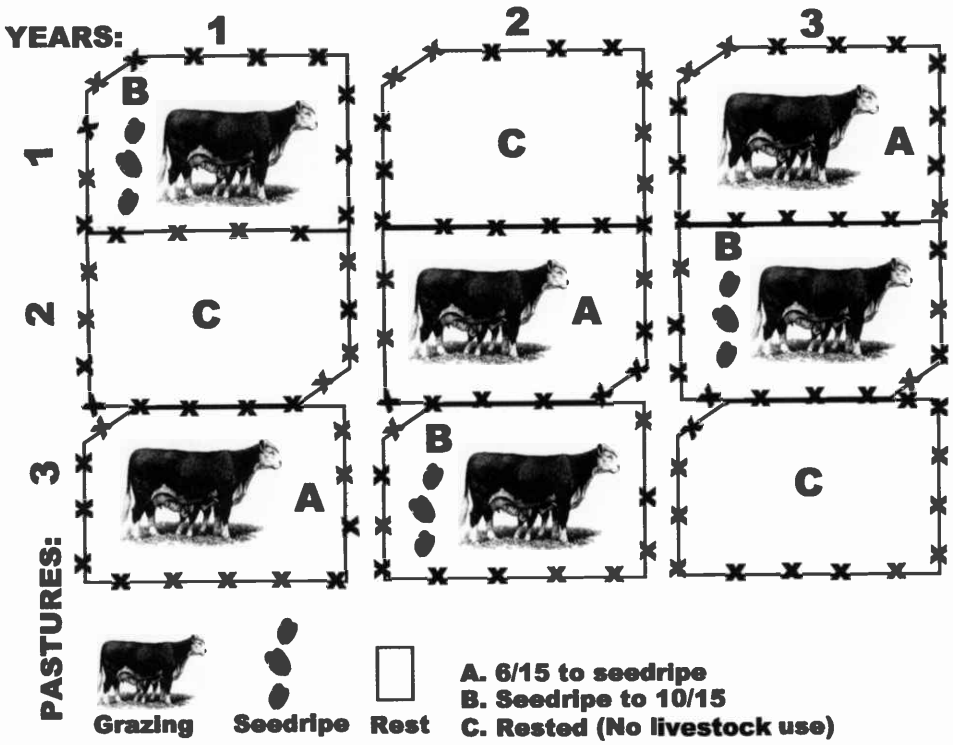

Figure 2. ***The Mount Haggin Wildlife Management Area rest-rotation grazing formula.***

this species as an indicator, we can generally assure that most plants will be at or past the seedripe stage of development prior to applying the B treatment.

At seedripe (mid August), cattle are allowed access to the pasture scheduled for the B treatment by being moved from the pasture that received the A treatment. Hoof action by cattle in the B treatment pasture helps trample or fix seeds into the soil. This trampling creates microenvironments (depressions) conducive to moisture retention and protection of seedlings through germination (6,2). The C treatment (rest from cattle grazing) always follows the B treatment. As previously mentioned, this allows seedlings time to grow and establish root systems prior to being subjected to cattle grazing.

In principle, the approach enables plants to maintain maximum vigor and food storage, which enables rapid post-grazing recovery during the long rest periods (6,2). The rest-rotation system is designed to allow for the maintenance of healthy, diverse, and vigorous rangeland vegetation. The aforementioned is an update to the details of the MHWMA rest-rotation grazing system described by Frisina (4).

Plant Community Changes

Sites preferred by cattle including historic salting areas or resting areas, where use by livestock is intense, were the preferred sites for photo monitoring. The rationale we used was that if positive changes became apparent at these intensely used locations, then it could be assumed that less intensely used areas were also improving. This approach was used because the grazing program is not a research project, but an ongoing management action and monitoring is included with other duties of the wildlife manager at MHWMA.

A number of management changes have been implemented on the MHWMA since its establishment in 1976, so changes in vegetation cannot be solely attributed to any one action. However, the single most significant land use action by MFWP was changing from more than 60 years of continuous season-long livestock grazing to a rest-rotation grazing strategy. Vegetation in uplands, riparian, and meadow habitats is responding favorably in the face of livestock grazing that has occurred under the rest-rotation grazing system since 1984 (Figures 3 through 9).

Figure 3. *The upper photo was taken by A. L. Hormay in 1977 when the area was under season-long continuous livestock grazing. The lower photo was taken in 1990 near the end of the A treatment (grazed mid-June to mid-August) under the rest-rotation grazing system. Cattle grazing remained continuous until 1984 when the rest-rotation grazing system was implemented. The lower photo was taken during the seventh grazing season under rest-rotation grazing management. The left white arrow in the upper photo serves as a reference point for the lower photo in Figure 4. Note that some areas of exposed soil or visible animal trails appear vegetated in 1990.*

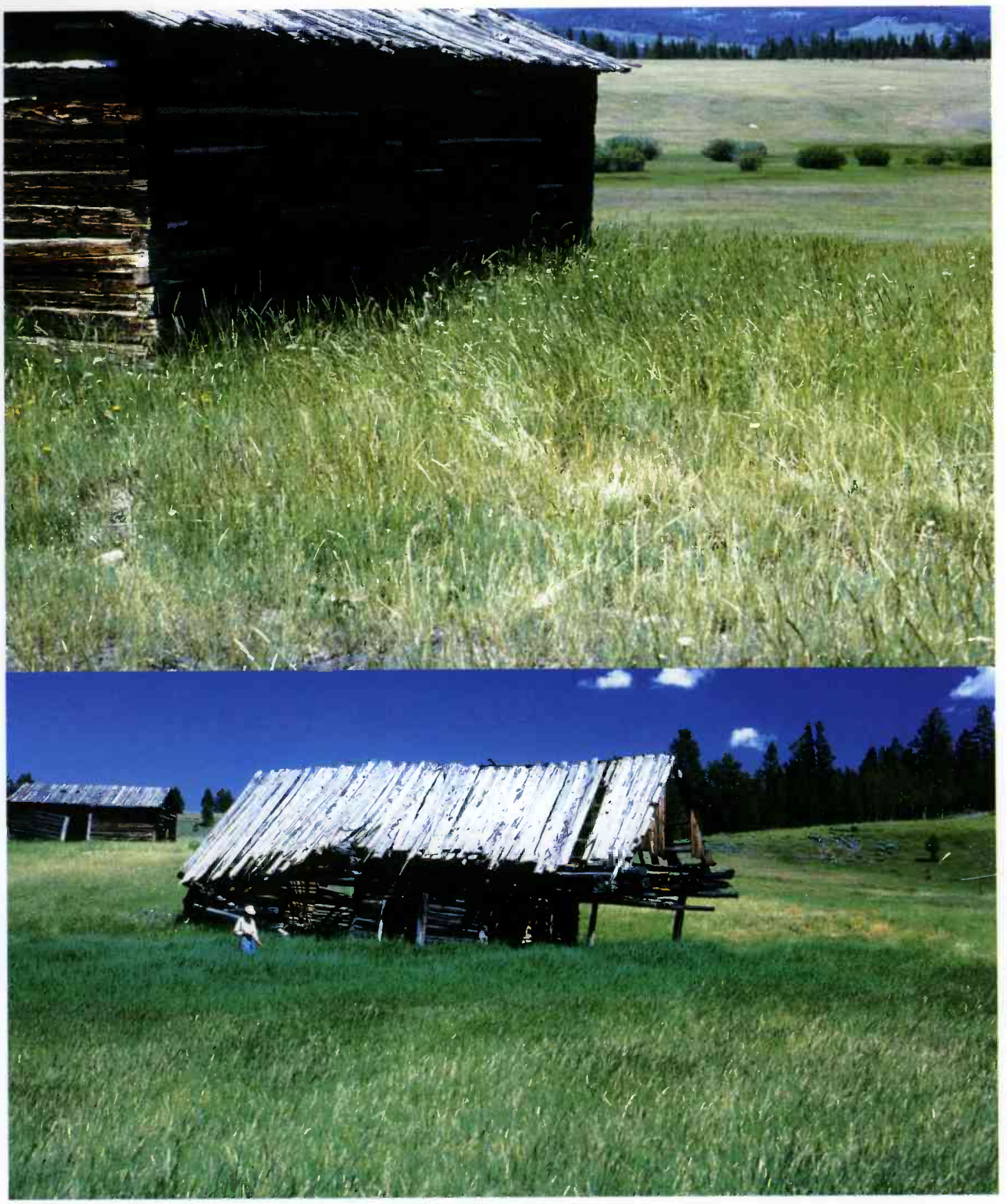

Figure 4. ***Close up photos of the same 2 cabins shown in Figure 3. Both photos were taken in 1991 prior to cows being placed in the pasture. The upper photo indicates the area that was mostly exposed soil in 1977 (Figure 3) has vegetated with a variety of meadow grasses and forbs. The foreground in the lower photo is within the area obviously intensely used by cattle in both of the Figure 3 photos (refer to left white arrow in the upper photo in Figure 3).***

Figure 5. ***The upper photo of an historic livestock salt ground was taken by A. L. Hormay in 1979 when the area had been subject to continuous and season-long grazing for more than 55 years. Continuous grazing was practiced another four years until 1984 when the rest-rotation grazing system was implemented. The lower photo was taken in 1990 during the seventh grazing season under rest-rotation management.***

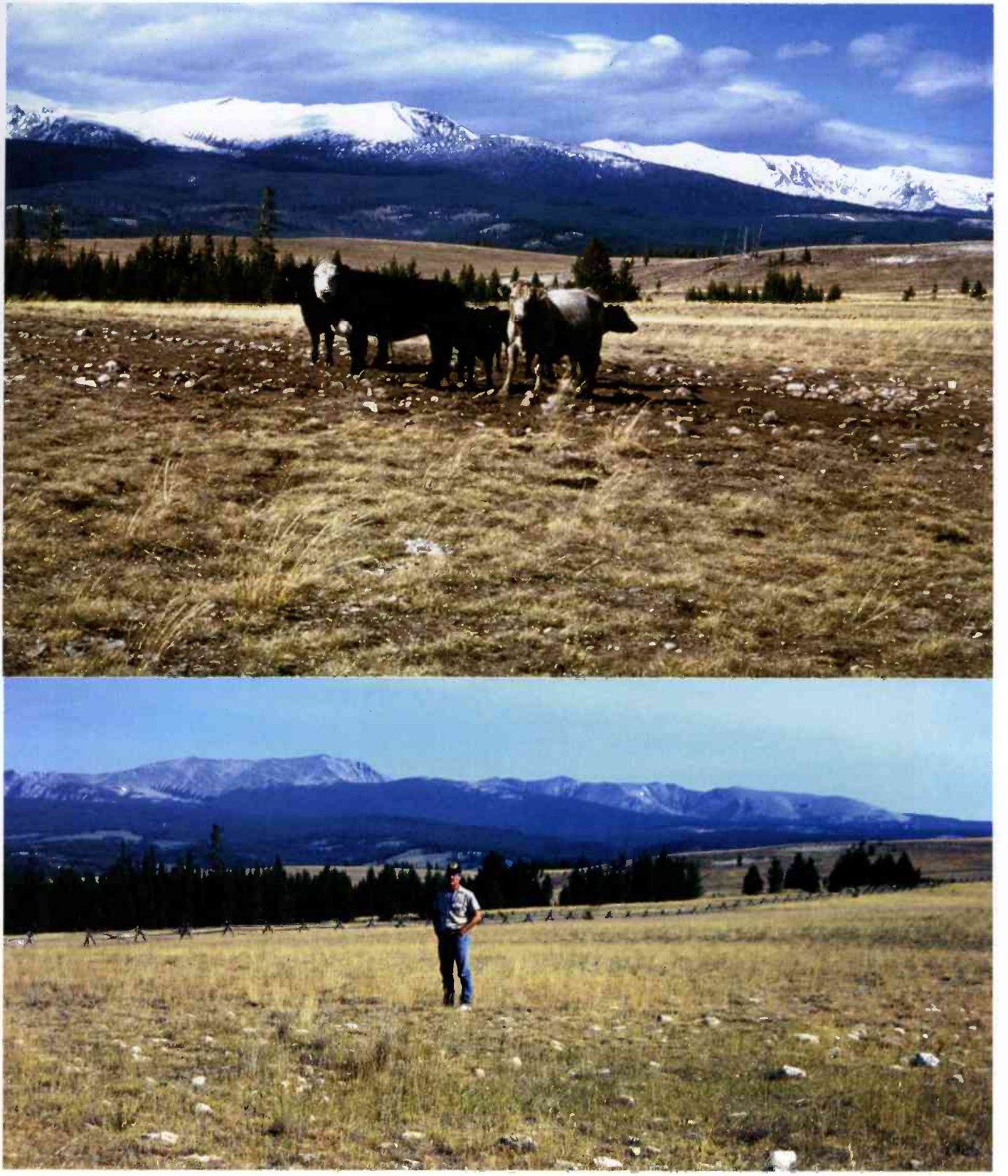

Figure 6. ***The upper photo of an historic salt ground was taken by A. L. Hormay in 1978 when the area was still subject to continuous grazing. Continuous grazing continued for another five years until 1984 when the rest-rotation grazing system was implemented. The lower photo was taken in 1990 during the seventh grazing season under rest-rotation grazing management.***

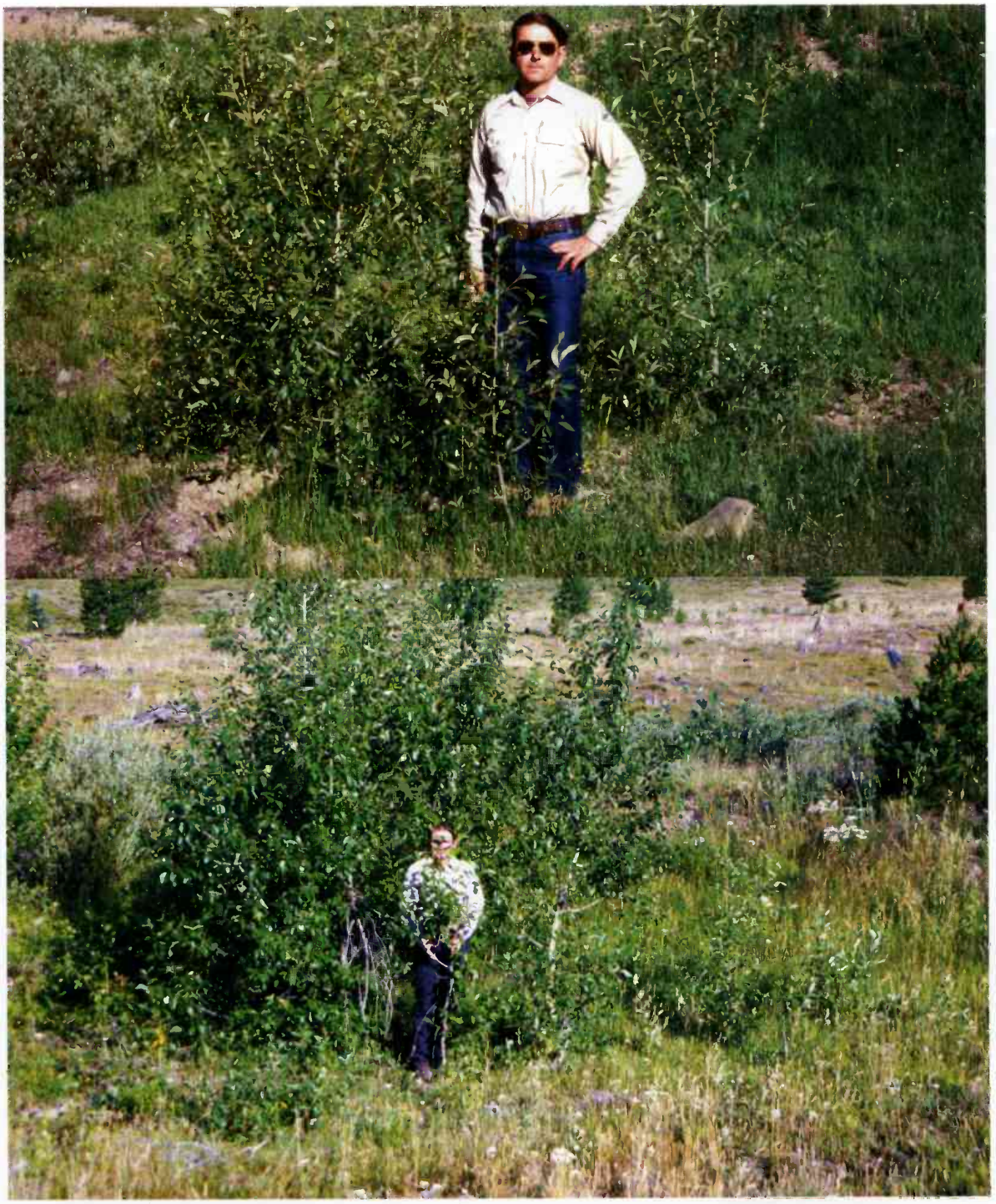

Figure 7. ***The upper photo of cottonwood was taken by A. L. Hormay in 1984, the year rest-rotation grazing was implemented on the Mount Haggin Wildlife Management Area. The photo was repeated in 1990 during the seventh year of the rest-rotation grazing system. Note the growth in height and width of cottonwood even though not protected from livestock grazing by fencing.***

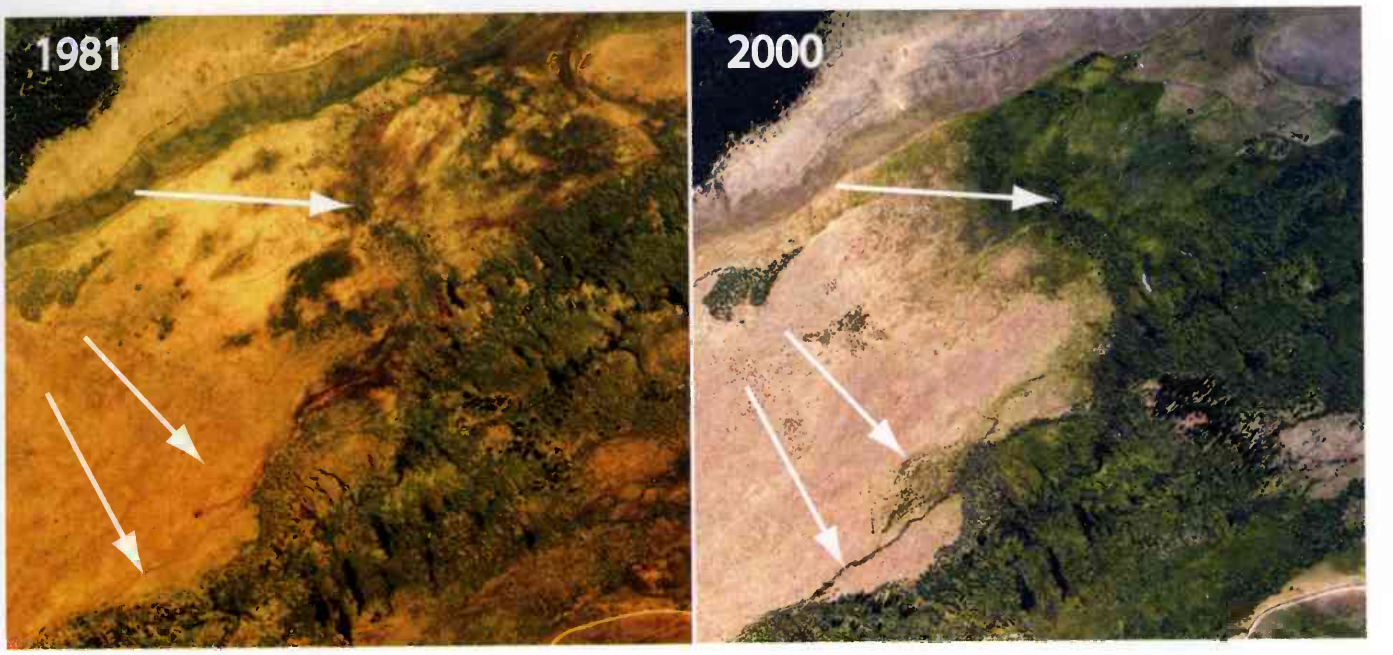

Figure 8. ***Aerial photographs document changes in willow distribution. Arrows in the 2000 photograph (right) indicate areas in which willow has expanded compared to the same areas shown in the 1981 photograph (left). Several factors appear to have influenced the increase in willow distribution that has occurred over the past two decades, including stream migration, an increase in the beaver population, browsing by moose, and the cessation of season-long livestock grazing.***

Additionally, habitats capable of supporting willow may still be recovering from the 1960's when willow was removed over large areas by spraying, bulldozing, and hay mowing (Figures 8 and 9). These destructive practices ended by the early 1970's, prior to MFWP ownership. Currently, destruction of willow is still a common practice on some private lands in the upper Bighole River Watershed.

Another impact on willow and other browse species has been increased use by big game populations inhabiting the MHWMA since its acquisition in 1976. Management actions by MFWP have encouraged deer, elk, and moose to increase (3). This is particularly true of winter use by moose which has resulted in an increase in browsing intensity (12). This increase in browsing not only produces hedge-like clusters of twigs (9), but the browsing of young willows may also promote the development of root suckers. Over the past three decades, browsing pressure by moose has increased (12).

In addition to the aforementioned management changes, the increased browsing by moose may be partly responsible for the increased distribution and density of willow outside the riparian corridor. However, concern that moose browsing has increased to a point that willow is being reduced in quantity on the MHWMA has prompted MFWP to intensify efforts to monitor willow communities and increase the moose harvest by hunters to control the population.

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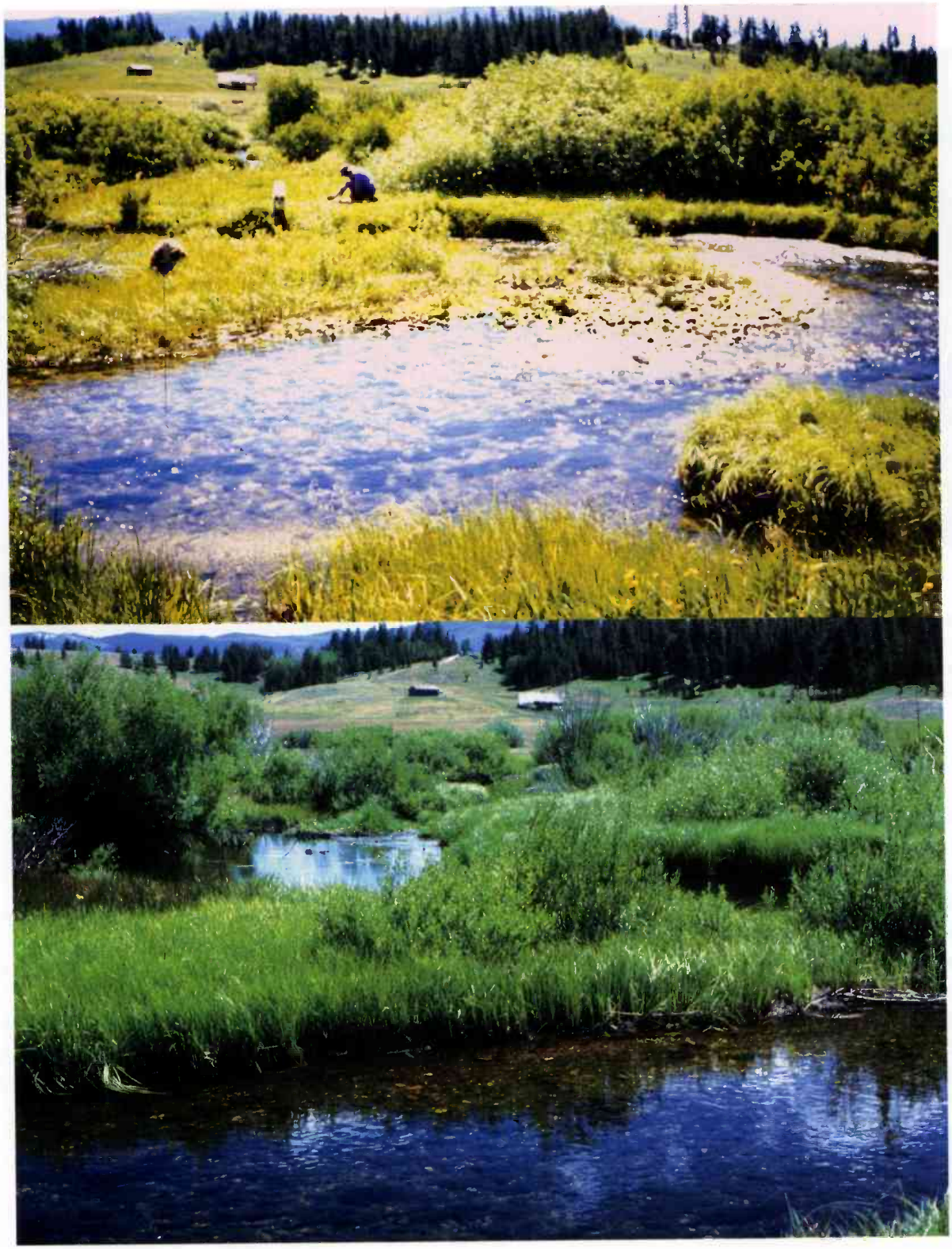

Figure 9. ***The upper photo was taken by Dick Oswald (MFWP) in 1980 when the area was still subject to continuous season-long grazing. Continuous grazing continued another three years until 1984 when the rest-rotation grazing system was implemented. The lower photo was taken in 1991 during the eighth grazing season under rest-rotation management. Note vegetation on gravel bar.***

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