

Was It Grassland? A Look at Vegetation in Brewster County, Texas through the Eyes of a Photographer in 1899

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ABSTRACT

In 1984 research was initiated to determine the field locations of several photographs taken in the Trans-Pecos in 1899 by R.T. Hill of the U.S. Geological Survey. The objective was to re-photograph the scene and document, through repeat photography, apparent changes in vegetation since 1899.

At each site photos were taken with a 35 mm SLR camera using a 50 mm and a 28 mm lens with black and white print film. A visual survey of vegetation was made and dominant species identified.

Comparative analysis of historic and modern photos indicate a wide variety of trends — from a large degree of shrub increase to no perceptible change, as well as situations in which the overall aspect of vegetation is the same as in 1899 but shrub height has increased.

INTRODUCTION

In the spring of 1984 research was initiated to determine the field locations in the Trans-Pecos at which various historic photographs had been taken. The objective was to re-photograph the scene and document, through this repeat photography process, apparent changes in vegetation since the period in which the original photograph was taken.

Documentation of original vegetation before extensive disturbance by civilized man's activities is of interest to range scientists in that the original vegetation may be indicative of potential natural vegetation, or climax vegetation, for the area. Ecological range condition is based on present species composition compared to perceived climax composition (Dyksterhuis, 1949). Several sources of information can be used to gather evidence concerning the nature of pre-settlement vegetation patterns. One is through historical literature, another by examining undisturbed natural landscapes (relict areas) and another through the use of historic photographs.

Quantitative description of vegetation in the Trans-Pecos seems to be non-existent in historic literature. Historic descriptions of vegetation can be very general or may provide a documentation of species (Parry, 1859), but the concept of relative amounts of different species (species composition) was apparently not considered important by early day travelers. It is precisely that type of information that modern scientists would like to have.

Early photographs can be useful in providing clues to the nature of historic vegetation in the absence of representative relict areas (Ames, 1976; Hastings and Turner, 1965; and Nelson, 1981). Nineteenth century photographers generally did not choose landscapes and vegetation as their primary subject matter. Exceptions to this are the photos taken on geo-

logic surveys such as the Haydon expedition of 1876 and the expedition of R.T. Hill through the Big Bend region of Texas in 1899. Hill was primarily interested in recording the Trans-Pecos landscape and his photos provide a view of vegetation as it existed at a particular moment, 87 years ago.

METHODS

A series of photographs taken in 1899 by R.T. Hill of the U.S. Geological Survey were used as a basis for then-and-now photographic comparison. The Hill photos were provided by the U.S.G.S. in Denver, Colorado where the original glass plate negatives are on file along with a brief description of photo locations. The field location of each photograph was determined by extensive travel throughout the suspected area by car and on foot. Exact locations were determined by matching topographical features visible in the background or foreground or both if possible. Hill traveled by wagon and used a bulky tripod mounted camera. Most of his photos were taken close to existing roads. Old maps (1895-1915) were useful in locating possible or probable photo points once the general area was determined. Exact dates of the historic photos are not available, but every attempt was made to match lighting as evidenced by direction and length of shadows. Modern photos were taken with a 35 mm SLR camera using a 50 mm or 28 mm lens and black and white print film. The 50 mm lens came closest to approximating the view in the historic photographs. At each site a visual survey of vegetation was made and dominant species identified. The distribution of dominant vegetation was compared between current conditions and the 1899 photos. The following presentation is based on an analysis of four representative photo matches out of 17 taken in 1984. Current research is continuing in the analysis of 20 or more of Hill's photos. Negatives, photographs and other archival material will be housed in the Archives of the Sul Ross State University library.

RESULTS

Figure 1-A (Hill, 1899) shows an open grassland on the 02 flats 37 miles south of Alpine (possibly tobosagrass — *Hilaria mutica*) with scattered shrubby plants (possibly mesquite — *Prosopis glandulosa*) to the left. A band of dense shrub growth extends northward from the center of the photo and appears to be encroaching onto the grassy flat. Large numbers of livestock were introduced into the area in the 1880's, and this grassland appears to be grazed closely. A fence is visible behind the horse indicating some degree of livestock management at the time (pieces of this fence were found by the authors). The modern photo taken in 1984 (Fig. 1-B) shows a well established community of creosotebush (*Larrea tridentata*) along with some whitethorn (*Acacia constricta*) and mesquite. The principle grass present is burrograss (*Scleropogon brevifolius*) with a few scattered remnants of tobosagrass. The actual grass cover appears to be as good as in 1899, but creosotebush has taken over as an overstory dominant.

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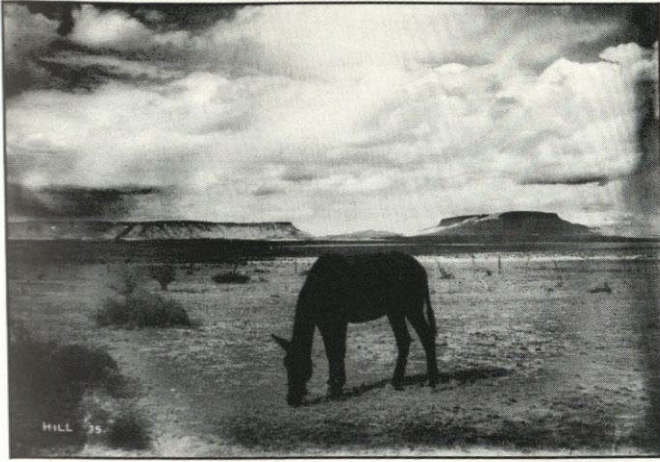


Figure 1-A. R.T. Hill #35, 1899. "Elephant mesa and whirlwind plateau, looking north; Brewster County, Texas" (U.S.G.S.).

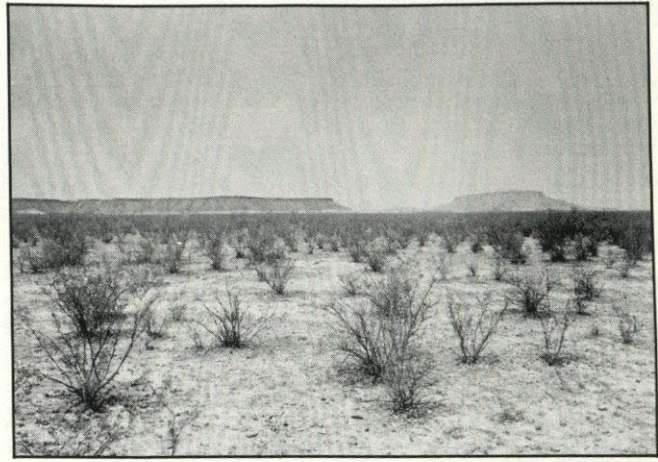


Figure 1-B. April, 1984. Elephant mountain and Mitchell mesa from the 02 flats, 37 miles south of Alpine, Texas, and 4 miles west of HyWy 118. U.S.G.S. grid coordinants FD3102 Emory Peak sheet.

Figure 2-A (Hill, 1899) shows a fully developed desert shrub community 54 miles south of Alpine probably consisting of creosotebush, mesquite and tarbush (*Flourensia cernua*). Interspaces between the shrubs consists of a low grass cover. Today (Figure 2-B) the brush density appears very similar to what existed in 1899 and is composed of creosotebush, tarbush, whitethorn acacia and scattered cacti. The grass cover appears as good or better than in 1899 and consists of three-awns (*Aristida spp.*), slim tridens (*Tridens mutica*), burrograss and ear muhly (*Muhlenbergia arenacea*). This photo pair documents a desert shrub community present in 1899 persisting relatively unchanged to the present time.

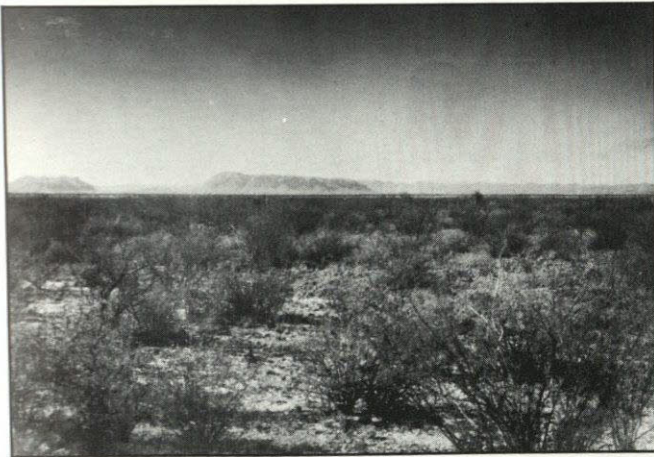


Figure 2-A. R.T. Hill #40, 1899. "Agua Fria mountain ten miles west; Brewster County, Texas" (U.S.G.S.).

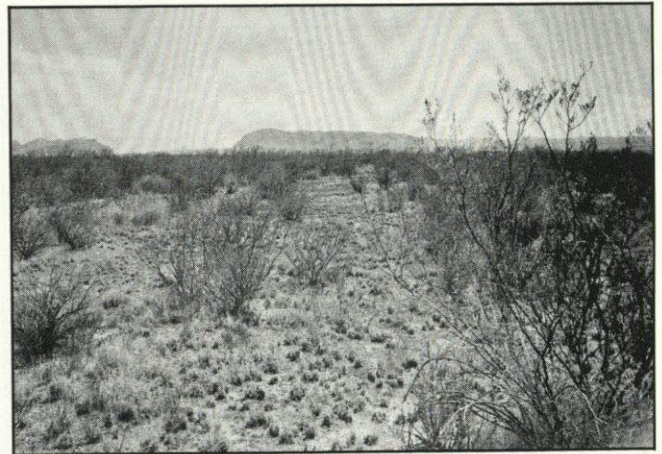


Figure 2-B. April, 1984. Aqua Fria Mountain with Packsaddle mountain to the left and the Solitario mountains in the background, 54 miles south of Alpine, Texas and .75 miles west of HyWy 118. U.S.G.S. grid coordinants FC3974, Emory Peak sheet.

Figure 3-A (Hill, 1899) was taken approximately 56.5 miles south of Alpine of the Camel's hump and Corazones mountains. The scene in 1899 is of a well established shrub community with an understory of short and sparse grass. There appears to be several species of shrubs present — possibly acacias, four-wing saltbush (*Atriplex canescens*) and creosotebush. The scene in 1984 (Figure 3-B) shows a scene dominated by shrubs much as it was in 1899. The creosotebush, mesquite and tarbush present today are taller than the shrubs present in 1899, and grass cover is almost non-existent. Mariola (*Parthenium incanum*) and whitethorn acacia are also present.

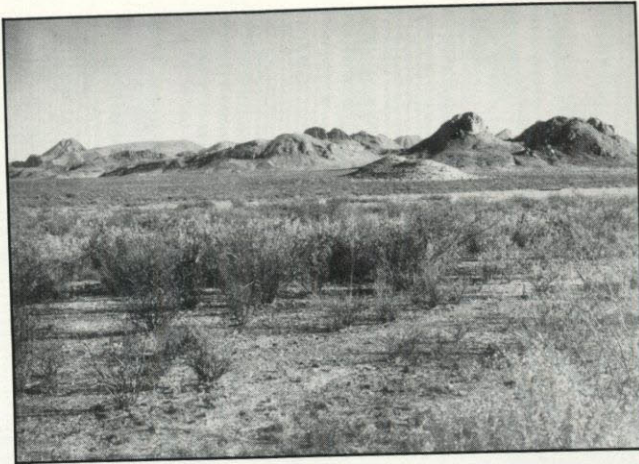


Figure 3-A. R.T. Hill #41, 1899. "Northwest mountains of the Corazones group; Brewster County, Texas"

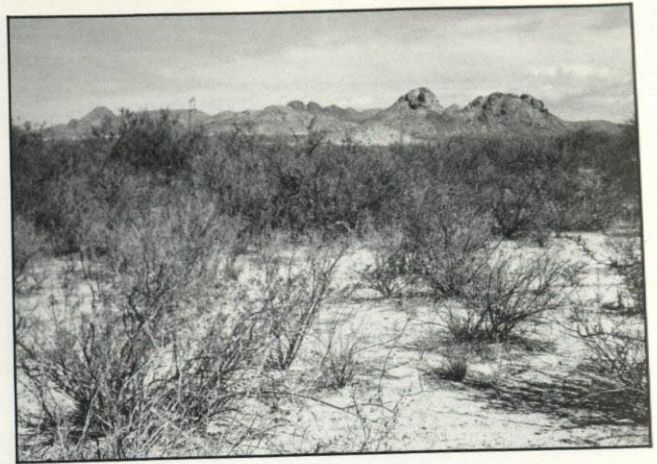


Figure 3-B. April, 1984. The Camel's Hump (right) and Corazones (left), 56.5 miles south of Alpine, Texas, and 1.5 miles east of HyWy 118. U.S.G.S. grid coordinants FC4270, Emory Peak sheet.

Figure 4-A (Hill, 1899) was taken of Mitre peak ten miles north of Alpine, Texas. Comparison with figure 4-B (1984) shows a stable grass cover since 1899 but a large increase in density and cover of catclaw mimosa (*Mimosa biuncifera*). Juniper trees (*Juniperus erythrocarpa*) are also evident today but absent in 1899. Scattered shrubs in the distance of the 1899 photo may be mesquite. Mesquite is present today in that area of the photo. The distant slopes of Mitre peak seem to be clear of shrubs in 1899. Today the slopes are quite closed with catclaw.

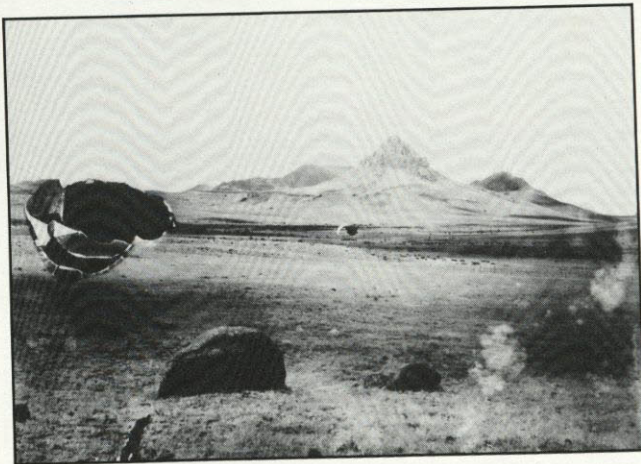


Figure 4-A. R.T. Hill #98, 1899. "Mitre peak, north edge of Alpine sheet, Texas. Jeff Davis County, Texas". (U.S.G.S.).

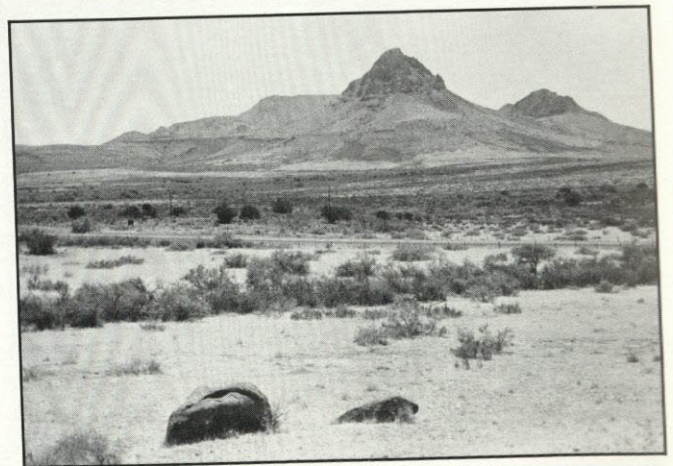


Figure 4-B. April, 1984. Mitre peak from a point .5 miles east of HyWy 118 at entrance to Musquiz Canyon, 10.5 miles north of Alpine, Texas. U.S.G.S. grid coordinants FD2174, Fort Stockton sheet.

DISCUSSION

Comparative analysis of the historic and modern photos indicate a wide variety of trends from a large degree of shrub increase (Figure 1 and 4) to no perceptible change (Figure 2) and a situation in which the overall aspect is similar today but shrub height is greater (Figure 3). Creosotebush and mesquite have been reported to have increased on, or invaded former desert grasslands. Reasons postulated have included overgrazing by livestock, suppression of wildfire and climate changes (Branson, 1985). Locations depicted in figures 1-3 are all within a zone designated as formerly or potentially desert grassland by the Soil Conservation Service. Figure 1 clearly supports the hypothesis of a grassland to shrub pattern since settlement. Figures 2 and 3 indicate the presence of shrub dominated communities only 17 years after the first intensive settlement and introduction of large numbers of livestock. On the basis of figures 2 and 3 we might conclude that: 1) the area was not a grassland but a desert shrub community prior to settlement, or 2) that conversion from grass to brush took place very rapidly and has remained relatively stable ever since.

The increase or invasion of catclaw in the Davis mountains since the 19th century is clearly indicated in figure 4. Similar trends were evident at Fort Davis where dramatic increases in catclaw were documented on the basis of 19 photos of the 1870-90 period (Nelson, 1981).

Grass cover appeared to be as good in the spring of 1984 as in 1899. The 1984 photos were taken prior to the normal precipitation season and depict the grass in its most deteriorated annual condition. Available records do not indicate a notable or widespread drought in the late 1890's in Texas (U.S.D.A., 1941). The aspect of grass cover in the historic photos is probably normal for the period under the influence of contemporary grazing, and may also represent year-old forage prior to seasonal rains.

Vegetation as recorded in Hill's photos of the Big Bend might not be considered pristine or climax (contemporary authorities such as Bently in 1904 and Bray in 1901 noted

deteriorating rangeland in West Texas at the turn of the century), but the photos document vegetation types existent only 17 years after intensive ranching was begun in the region (Casey, 1972). Southern Brewster county apparently supported a vegetation type closer to a shrub or shrub savana than an open grassland at that time. Shrub density or height increased on most sites since 1899. Creosotebush has encroached into some low lying tobosa flats and catclaw has encroached heavily on mountain footslopes.

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