5.4 APPENDIX D – SYNOPSIS OF STUDY 17-6A/B.M. NO. 4

SYNOPSIS OF STUDY 17-6A/B.M. NO. 4

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DEAD HORSE BENCH

West Fork-Blacks Fork

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In 1965 the Forest Service established a monitoring site called Bench Mark No. 4 on the Dead Horse Bench area. The study estimated utilization and ground cover. Twenty samples were taken. The sample interval was 1 chain, and the plot size was a circular 0.96 square foot. The samples were taken in a linear direction on the ground. This sampling procedure was also known as a "Grazing Impact Analysis". It differed from the "Site Analysis" procedure in that it also estimated by weight, the amount of forage utilized by species (Forest Service, Region 4 FSH 2209.21, Range Analysis Handbook, 12/81). This study was conducted for three consecutive years, 1965 through 1967. The ground cover portion of the study was conducted again in 1999. The following summarizes the ground cover estimates for those four years:

Ground Cover Study 17-6A/B.M. #4 Dead Horse Bench

	1965	1966	1967	1999
% Bare Ground	40%	35%	32%	28.7%
%Rock	5%	6%	1%	3.5%
%Pavement	12%	4%	2%	1.3%
%Veg.& Litter	45%	55%	65%	66.5%
Total Ground Cover (rock+veg.+litter)	50%	61%	66%	70%

The study indicates that ground cover has been relative stable since 1965. Repeat photography of 1965 photos also indicated a stable ground cover trend.

In 1997, the site was revisited and a Nested Frequency trend study was established at the beginning plot site of the "Grazing Impact Analysis". This study was named 17-6A. It sampled 400 points and measured a ground cover of 47.6%.

The Nested Frequency and Grazing Impact Analysis studies are not directly comparable. The Nested Frequency measures ground cover in a more confined area; it is restricted to primarily one vegetation community. Whereas the Grazing Impact Analysis measures ground cover over a long linear transect that crosses a mosaic of vegetation communities.

The RHEIS for the Wasatch-Cache National Forest set a ground cover standard of 85% of potential. In an effort to estimate potential ground cover for study site 17-6A, a site on the Ashley National Forest was also measured in 1997 using the Nested Frequency method. This site was called ASNF 22-11(Fall creek). The ground cover here measured 79%. This was thought to be near the site potential for both sites since ASNF 22-11 had not been grazed by sheep for 23 years and the frequency of sheep grazing from 1965 to 1974 was limited to only 4 years out of 10. Using 79% as the ground cover potential for study 17-6A, the minimum ground requirement for 17-6A was thought to be 67%. Using this as a reference site, the Dead horse Bench site (17-6A) did not meet the 85% potential ground cover standard. The 1997 Nested Frequency measured only 47.6% ground cover for the 17-6A site.

Continued field work and literature review has taken place since 1997 that sheds additional light on the ground cover conditions at site 17-6A. It is now evident that 17-6A is located within a snow bed site and that the ground cover conditions found there are what can be expected given the inherent conditions of the site. The inherent conditions of the site are the major factors influencing the ground cover conditions; sheep grazing, given the light utilization of the key species noted over the last few years, is having a minor influence on ground cover conditions at this site.

17-6A is Parry rush plant community. Copper et al. 1997, found bare ground and gravel covered 47% of the soil surface in a Parry rush/bear fleabane community in Montana (see page 28 –soils in Copper et al. 1997). Study 17-6A had 52.5% bare soil and pavement. This is within 6% of the gravel and soil listed by Copper et al. 1997. They found 53% ground cover for the type. Study 17-6A had 47.6% or 48% ground cover. 48 divided by 53 = 90%. This would indicate 17-6A is within 90% of potential. The Montana study does not set an absolute reference. Their work was based on only 2 sites. However, the Montana study provides strong support for the inherent barren nature of 17-6A.

Both snow bed features and influence of outwash from a steep, deep snow bed in boulders are inherent features of site ASNF 22-11. These inherent features make this site of some value for comparison with other sites with snow bed and/or outwash features. However, this site is not directly comparable to 17-6A. The two sites do not have equal amounts of snow accumulation, and therefore snow duration for both sites would not be the same; snow accumulation and snow duration directly influence ground cover conditions. Also, ASNF 22-11 site does not have the gopher activity that is common to site 17-6A. If the gophers were removed from 17-6A, an improvement in ground cover would be expected. A re-take of close up photos of study 17-6A in 2001 readily illustrates that gopher activity is keeping the soil stirred up at this site.

It is desirable to locate and monitor a snow bed reference site without livestock grazing that would be more comparable to site 17-6A than ASNF 22-11. A reference site that includes a Parry rush community with equal duration of snow cover would be most appropriate. However, if a Parry rush community cannot be found in a reference area, then a site or sites of equal duration of snow cover in an another community type will need to be used. If such a site is found in an area of with little or no livestock use, it would be more appropriate as a reference site than ASNF 22-11.

In 2001 study 17-6D was established on a bench above the snow bed of the contrasting site at 17-6A. It is located only 440 feet west of study 17-6A. Ground cover was measured at about 97% with 3 percent pocket gopher disturbance. This contrasts with about 50% gopher disturbance at 17-6A in a moderately deep snow bed.

In evaluating study 17-6A with 17-6D, it becomes apparent that the patterns of vegetation and accompanying ground cover are all related to duration of snow cover and pocket gophers. The patterns appear to be poorly, if at all, correlated with sheep use. Evaluation of studies 17-6B, 17-2A, 17-10C, 17-11, 17-31C and 17-33 also support that conclusion. These results are supported by the literature review conducted by Range Ecologist Sherel Goodrich; a list of this literature is attached.

Summary:

- it is now believed that 17-6A is meeting the RHEIS ground cover requirements
- ASNF 22-11 site is not directly comparable to the 17-6A site
- patterns of vegetation and the accompanying ground cover are related to the duration of snow cover and pocket gophers
- patterns of vegetation appear poorly, if at all, correlated with sheep use
- potential ground cover estimates need to be tied to specific plant communities which are influenced by the duration of snow cover, and associated rodent disturbance
- it is my professional opinion that the ground cover measured at Study 17-6A in 1997 meets the requirements of the RHEIS (85% of potential); this change of opinion has been influenced by the continuing field work and literature review of Sherel Goodrich and myself since 1997