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UNITED STATES DISTRICT COURT

DISTRICT OF NEVADA

NEVADA LAND ACTION ASSOCIATION, et al.,

Plaintiffs,

vs.

UNITED STATES OF AMERICA, et al.

Defendants.

CV-S-88-889-HDM(LRL)

AFFIDAVIT OF DR. RICHARD E. ECKERT, JR.

STATE OF )
)ss
COUNTY OF )

I, Richard E. Eckert, Jr., being sworn under penalty of perjury, depose and say:

1. I have a Ph.D. in Range Ecology, with a minor in Soils and Animal Science, from Oregon State University. I also have an M.S. degree in Range Management from the University of Nevada, Reno; and I have a B.S. degree in Agronomy from the University of California, Davis.

2. I have been professionally engaged in agricultural research for a period in excess of thirty years, primarily as a range scientist with the United States Department of Agriculture, Agricultural Research Service. Certain of my research specialties include the

following: autecological and synecological studies with application to vegetation improvement, landscape ecology, land-use planning, grazing management, secondary succession and resource conservation.

3. I have been extensively involved in the development, financing and direction, as the lead scientist and project manager, in an interagency, multidisciplinary study which evaluated the integrated responses of vegetation, cattle, water, muledeer, sage grouse, fish and economics to different land management strategies.

4. I have authored numerous publications, including over fifty technical papers in refereed journals such as the Journal of Range Management, Ecology and Weed and Soil Sciences. I have also written chapters for range publications, in addition to range bulletins and numerous popular papers.

5. Over the past several months I have engaged in a review and critique of the United States Forest Service vegetation monitoring techniques of cattle grazing on wetland or riparian sites on RO Livestock allotments on the Toiyabe National Forest. These techniques are being implemented pursuant to the perceived direction provided by the Toiyabe National Forest Land and Resource Management Plan.

6. The summary of my review and critique, which addresses technical matters pertaining to both the formulation and implementation of the Forest Plan on the RO Livestock allotments, is as follows:

a. The major problem which has developed with the Forest Service formulation and implementation of the Forest Plan arises from the Forest Service emphasis on measuring utilization in small riparian areas, and using these utilization estimates as the basis for livestock management for each allotment as a whole. Livestock use of small areas of riparian vegetation is not related to use in the entire

grazing unit, rather, heavy use of riparian vegetation may be related only to livestock distribution matters. However, utilization of riparian vegetation taken during the grazing season is used by the Forest Service as the sole basis for removing livestock from a grazing unit or from the allotment. Furthermore, the Forest Service collects utilization data for three years on season-long allotments or for one full cycle of rotation systems for use in firming up grazing capacities on the entire allotment. Because no relation exists between use on riparian areas and use on upland areas, the use of these data alone for livestock removal decisions and for carrying capacity determination is not logical. In the event livestock are not widely distributed, utilization on riparian sites will continue to exceed use standards, and even if AUM's are reduced, overuse of riparian sites will still occur. The end result of this kind of management is that livestock removal and carrying capacity decisions for the entire unit are based only on the available forage in the riparian zone. This results in a significant and unnecessary loss of AUM's and little or no use of upland vegetation. It is unacceptable range practice for the Forest Service to implement a policy of livestock removal and carrying capacity determinations based upon the degree of use on sites that make up less than one percent of the area of the entire allotment. Moreover, all of the Forest Service livestock removal and carrying capacity adjustments are set in a time frame such as to be implemented before any meaningful long-term trend information is available.

Trend information is critical in determining proper range management. Simple utilization estimates which have been used since the inception of the Forest Plan are statistically inadequate and

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scientifically indefensible and improper for obtaining site specific, long-term trend data.

Site specific, long-term trend studies are absolutely critical in determining compliance with proper range management objectives. Trend information measures changes in vegetation characteristics over time. These changes are used to assess progress toward meeting long-term grazing management goals and objectives and are the correct bases for major changes in livestock management. Trend studies should be conducted on both upland and riparian sites, not just riparian sites, and must be conducted on specific ecological sites and seral status so that results can be extrapolated. The Forest Service does not have adequate range information over a sufficient period of time from which to establish technically-based, long term-trend studies. Nor did the Forest Service have these data during formulation of the Toiyabe Forest Plan.

Few, and in some cases no, long-term monitoring studies are being conducted. Furthermore, once these studies are established it may be many years before any meaningful trend data are available. In the meantime, it appears that the Forest Service continues to improperly use utilization levels in the riparian zone as the sole tool on which to base management decisions and livestock grazing adjustments for each allotment as a whole.

b. The interpretation of what constitutes a "key area" for purposes of range monitoring or evaluation is inconsistent with the intent of "key area" as defined in the Nevada Rangeland Monitoring Handbook, which Handbook is required, together with the Forest Service Handbook, to be followed by the Forest Service in the implementation of the Forest Plan.

c. The key area concept is not being used for utilization estimates by the Forest Service on sites away from benchmark sites contrary to accepted range practice.

d. The Forest Service is attempting to implement the requirements of the Forest Plan with very limited knowledge about the sites they wish to manage.

e. Allotment management plans prepared for areas grazed by livestock are based on little or no soils information.

f. It appears that available soils information is not being used to select key areas and benchmark study sites.

g. Key areas and benchmark sites can not be properly selected without soils information.

h. Without information on soil and vegetation parameters such as site potential and ecological status, the Forest Service can not state reasonable management objectives for monitoring the effects of livestock use.

i. Based upon the present Forest Service approach to long-term monitoring without conducting a soil survey, the long-term monitoring results from a benchmark site can not be extrapolated to other riparian sites. Therefore, the results can only be applied to the specific soil-vegetation unit where monitoring is conducted.

j. The utilization standards presented in the Forest Plan are technically incorrect because they are not based on scientifically collected data, rather they are based on observations, personal experiences, theoretical concepts and hearsay.

k. The Forest Service definition of utilization does not include the concept of current year's growth, only the degree of use at certain times during the growing season. The definition for

utilization, allowable use and proper use should properly include the concept of current year's growth.

l. The present Forest Service utilization standards are not technically adequate because they do not address defoliation at different phenological stages.

m. The Forest Plan calls for monitoring utilization by key species, but the Forest Service does not monitor by key species.

n. The bulk of the utilization estimates on an allotment are made without the use of plots or visual aids. Utilization estimates made without use of visual aids such as photo guides and actual height-weight distribution data can result in overestimating utilization by one to two utilization classes (20 to 40%).

o. The Forest Service uses the Ocular Estimate method for monitoring utilization, however such method, although marginally adequate for monitoring the most abundant species in a stand, does not give any information about utilization on key species.

p. The Forest Service utilization standards for riparian species would better be based on a concrete concept such as stubble height rather than on the abstract concept of herbage removed.

q. The Ocular Estimate technique is not very accurate and should not be used to conform to the exacting utilization standards established in the Forest Plan. Yet accuracy is the desired end product for data that will be used for making decisions about use of rangeland resources. The Forest Service should re-evaluate the utilization standards in the Forest Plan and perhaps use a utilization class such as (60-70%) as a standard regardless of whether range condition is satisfactory or unsatisfactory or whether the area is in a management

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system or not. Also, the Forest Service should consider the growth form of key species when adapting utilization standards.

r. The Forest Service asserts that plants in the riparian zones are in very low vigor. However, the Forest Service can not quantify the basis for their view, because data do not exist.

s. The exacting utilization standards presented in the Toiyabe Forest Plan are not warranted based on the low accuracy of the field method used to collect utilization data. Furthermore, the Forest Service has not 1) adequately developed grazing use maps; 2) not adequately collected and/or utilized weather data from within the individual allotments; 3) not adequately collected phenology data from protected areas; and 4) not adequately used photos.

t. The Forest Service Handbook states that frequency is used to describe ecological status on a benchmark site. Ecological status, based on frequency, cannot be determined unless the frequency of desirable, intermediate and undesirable plants is known for a series of sites of different range condition for a specific ecological site that is the same ecological site as is the benchmark site. The Forest Service does not have such information.

u. The Forest Service Handbook also calls for placing benchmark sites in areas of mid or high seral stage. Without soils and vegetation information on a number of sites of known ecological potential and ecological status, it is impossible to state the seral stage of vegetation on a benchmark site with any degree of accuracy.

v. The Forest Service Handbook further states that long-term monitoring techniques are to be applied to benchmark sites. The Forest Service Handbook suggests one benchmark site in a riparian area in each grazing unit and extrapolation of results to other sites

in the unit. With no soils map, extrapolation of information among sites of unknown ecological potential or ecological status is biologically and technically impossible. In addition, extrapolation of data can not be done, even if the ecological potential and ecological status were known, because replication of trend plots at each location is required for extrapolation purposes and the Forest Service does not use a replicated-plot design for its trend studies. One benchmark site per grazing unit, particularly one site in a riparian area, is hardly enough to evaluate the effects of livestock grazing on that unit. The Forest Service needs to select additional monitoring sites and collect frequency and utilization data. The Forest Service also has inadequately collected and used phenology information.

w. The Forest Service is delinquent in the process of identifying benchmark locations and in the establishment of long-term trend studies on benchmark sites.

In conclusion, fundamentally serious and unacceptable range science flaws exist in both the formulation and subsequent implementation by the Forest Service of the Toiyabe National Forest Land and Resource Management Plan. Critical range use decisions, including riparian area standards and guidelines, were established in the Toiyabe Forest Plan without sufficient scientific data, and were apparently just simply made up by the Forest Service during the course of the planning process.

DR. RICHARD E. ECKERT, JR.

Subscribed and sworn to before me this 29th day of May, 1991.

DEBRA J BAKER
Notary Public - State of Nevada
Appointment Recorded in Washoe County
MY APPOINTMENT EXPIRES JUNE 14 1992

NOTARY PUBLIC