Peter M. Lacy ("Mac") (OSB # 01322)
Oregon Natural Desert Association
917 SW Oak Street, Suite 408
Portland, OR 97205
(503) 525-0193
lacy@onda.org

Stephanie M. Parent (OSB # 92590)
Pacific Environmental Advocacy Center
10015 SW Terwilliger Blvd.
Portland, OR 97219
(503) 768-6736
(503) 768-6642 (fax)
parent@lclark.edu

Attorneys for Plaintiffs

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF OREGON

OREGON NATURAL DESERT ASS'N et al., Case No. 03-CV-213-KI

Plaintiffs,

v.

UNITED STATES FOREST SERV. et al.,

Defendants,

and

ROBERTSON RANCH et al.,

Intervenor-Defendants,

and

OREGON CATTLEMEN'S ASS'N,

Intervenor-Defendants.

SECOND DECLARATION OF ROBERT L. BESCHTA, Ph.D.

I, ROBERT L. BESCHTA, Ph.D., declare and state as follows.

1. My name is Robert L. Beschta. I am the same Robert L. Beschta who submitted a first declaration in this case. I am a certified professional hydrologist (#317 American Institute of Hydrology) with more that 30 years of experience in studies of hydrology and riparian systems. For informational purposes, I am an Emeritus Professor of Forest Hydrology with the Department of Forest Engineering at Oregon State University and have been affiliated with that department since 1974. I have a B.S. in Forest Management from Colorado State University (1965), a M.S. in Forest Hydrology from Utah State University (1967), and a Ph.D. in Watershed Management (with a minor in Hydrology) from the University of Arizona (1974).

Scope of Review

2. On October 20 and 21st of 2004, I personally observed and evaluated stream channels, riparian areas, and watershed conditions, with Jonathan J. Rhodes, in allotments draining into the Malheur Wild and Scenic River corridor (Dollar Basin/Star Glade, Summit Prairie, and Bluebucket) and the North Fork Malheur River Scenic River corridor (Flag Prairie, North Fork, and Spring Creek) on the Malheur National Forest. During these field evaluations I took photographs, measured plants, and compiled field notes.

3. I submit this declaration to explain the role of grazing practices in allotments along the Malheur and the North Fork Malheur wild and scenic rivers relative to protection of outstandingly remarkable values (hereafter: "ORVs"), meeting riparian area requirements of the Malheur National Forest Land and Resource Management Plan (hereafter: "LRMP"), and attainment of INFISH Riparian Management Objectives (hereafter: "RMOs"). Historical and recent grazing practices have directly and indirectly affected riparian vegetation, floodplains, channel morphology, streambank conditions, hydrologic processes, water quality, and aquatic

habitat for salmonids. My declaration focuses on the effects these practices have had upon riparian vegetation and to hydro-geomorphic processes associated with streams, channels, and floodplains. Special emphasis will be made regarding how these changes impact fisheries habitat.

Discussion Points

A. On allotments tributary to the Malheur and North Fork Malheur wild and scenic rivers and which were grazed in the summer of 2004, grazing continues to adversely affect ORVs and prevents the attainment of INFISH RMOs.

4. Allotments tributary to the Malheur and North Fork Malheur wild and scenic rivers have historically experienced significant adverse effects to ORVs and have failed to meet INFISH RMOs. Thus, grazing on the Bluebucket Allotment (Rock Springs Unit) continues to impact the ORVs and RMOs of these systems and prevent recovery. In my previous declaration in this case, dated February 29, 2004, I addressed in detail the impacts of grazing and I incorporate those observations, discussion, and conclusions by reference in this declaration. I continue to stand by the observations and conclusions as stated in my first declaration, in conjunction with cited literature, that historical and ongoing grazing practices in each of the allotments at issue in this case: (1) have physically damaged or destroyed overhanging streambanks from the shearing action of cattle hooves, (2) have caused a loss of root strength of herbaceous and woody plant species thus causing widespread surface erosion, channel incision and widening, channel instability, and a loss of hydrologic connectivity with historical floodplains, (3) have caused the loss of riparian plant communities that shade streams thus increasing summertime water temperatures, and (4) have adversely affected additional riparian functions such that habitats beneficial to fisheries and wildlife have been degraded (Chaney et al. 1990, Platts 1991, Ohmart 1996, Dwire et al. 1999). As stated in my first declaration, current

grazing practices are not only preventing attainment of critical RMOs, but they are causing continued degradation.

B. Most allotments visited during the October 20-21 field trip experienced non-use this past summer; some have seen the implementation of a program to protect established willows.

5. Permitees and the Forest Service are to be commended for deciding not to graze many of the allotments associated with the Malheur and North Fork Malheur wild and scenic rivers. Allotments and units which I was able to observe and which were not grazed included Dollar Basin/Star Glade Allotment (South Star Glade Unit, Dollar Unit), Summit Prairie Allotment (Sage Hen Unit), Flag Prairie Allotment (South River Unit), North Fork Allotment (South River Unit), and Spring Creek Allotment (River Holding Unit). By not grazing these allotments, a variety of grasses, sedges, rushes, and forbs were able to grow throughout the summer without loss of above-ground biomass. At the end of the 2004 growing season, many plant leaves and stems will become litter which is particularly important for protecting soils from surface erosion and for maintaining and improving soil structure as these vegetative components decay and become incorporated into the soil. This not only increases the amount of organic matter in soils (an important component of soil forming processes) but also recycles important nutrients. Not grazing also insures higher carbohydrate reserves in root systems of many of perennial grasses and sedges such that their production of above ground biomass will likely be increased during the next growing season. Over the long-term, increased root biomass provides for improved streambank and floodplain stability during periods of high flow.

6. Deciduous woody species (e.g., willows) in ungrazed allotments have been able to grow unhindered from the intense browsing normally experienced when the allotments are grazed. With the cessation of livestock browsing in rested units, established deciduous woody

species have been able to increase in height, some for perhaps the first time in many years. If these units continue to be rested from livestock use, additional height growth will allow many of these currently browsing-suppressed species to provide increased browse for wild ungulates, increased seed production, and increased below-ground biomass (larger root systems).

7. In 2004, the U.S. Forest Service initiated a program of establishing wire cages around remnant willows along the Malheur Wild and Scenic River of the Dollar Basin/Star Glade Allotment.[1] Willows are exceptionally sparse along this reach. The construction of wire cages around the few willows that remain will hopefully forestall the eradication of riparian willows from this allotment. However, with or without future grazing, simply protecting a few willows will contribute little towards attaining RMOs or the reestablishment of deciduous hardwood communities as required in the Malheur National Forest LRMP. Willow heights were measured in six of the easily accessible cages (most were on the opposite side of the river); willow heights averaged approximately 24 inches (50 cm) indicating previous grazing practices had prevented height growth above this level. In contrast, willows inside the nearby Summit Creek exclosure (even though they are readily accessible to wild ungulates) were consistently 4-5 ft, or more, in height. The Summit Creek Exclosure has been exclosed from livestock grazing for approximately 26 years (Kauffman et al., 2002).

C. While the removal of grazing pressure from these allotments is a necessary first step in restoring riparian and stream functions, the elimination of adverse grazing impacts is of the utmost importance until ORVs have recovered and RMOs are attained.

8. Riparian ecosystems are relatively resilient to natural disturbances (fires, floods, drought) and indeed require such disturbance regimes to maintain characteristic plant

[1] For an example of what these wire cages look like and how small they are, see Attachment 1 to this declaration, which is a photograph I took during my October 2004 field visit.

communities and stream morphology (e.g., pools/riffles; widths/depths). However, intensive herbivory by domestic livestock is easily capable of overcoming such resiliency and initiating a downward spiral in the quality and functioning of these systems. The degradation of vegetation (loss of root strength, inability of young plants to establish because of intensive and persistent herbivory), altered channels (incision and widening, loss of overhanging banks), and the decoupling of riparian areas from their streams (loss of overbank flows) ultimately contribute to the degradation and loss of fisheries habitat (pools, overhanging banks, clean gravels, cool water). Such changes did not happen during a single grazing season but instead resulted from the cumulative effects of grazing over a period of many years. Thus, any expectation of immediately recovering ORVs or achieving RMOs after resting an allotment for a growing season or two would be naiveté.

9. The recovery of the Malheur and North Fork Malheur wild and scenic river channel systems (to recover and protect ORVs and to attain RMOs) first requires a full recovery of diverse riparian plant communities that can then interact with varying streamflows over extended periods of time. Recovery of existing channels, which are largely characterized by high width/depth ratios, extensive eroding banks, a lack of overhanging banks, few pools, and low channel sinuosity, initially requires the recovery of both herbaceous plants (e.g., sedges, moist-site grasses) and deciduous woody species (e.g., willows, alders) that are characteristic of these riparian systems. Thus, recovering and maintaining diverse, healthy, and functionally intact riparian plant communities continues to represent the highest management priority for these allotments

10. While remnant willows in some of the ungrazed units have gotten somewhat taller, deciduous woody species in riparian areas continue to remain in a highly degraded state.

The nearly total lack of newly established willows (and other deciduous woody species) remains a huge problem for riparian systems throughout these wild and scenic river corridors and their watersheds. The few remnant willows, while slightly taller after a summer of growth without being grazed, are ineffective in stabilizing banks, in shading streams, or in providing other riparian functions. This is because: (1) they remain too few in number, (2) they generally occur away from streambanks, and (3) they occupy historical floodplain surfaces that no longer experience overbank flows. Additional years of non-grazing are needed so that (1) remaining willows can grow above the browse level of livestock into mature plants and produce seed, (2) additional seedlings or vegetatively reproduced plants can again become widely established on streambanks and across riparian areas, and (3) these plants can again provide a wide variety of aquatic and riparian functions important to maintaining high water quality and having sustainable fisheries. These aquatic and riparian functions include: root strength for bank stability and the narrowing of channels; hydraulic roughness from stems and leaves during overbank flows, thus contributing to floodplain development; shade to streams, thus reducing high water temperatures; and organic carbon and nutrients to soils, thus improving their structure and productivity.

D. Livestock exclosures continue to provide site-specific information that point directly to the failure of historical and current grazing practices within allotments of the Malheur National Forest for maintaining or protecting streams, riparian areas, and other dependent resources, as well as a lack of recovery. Until areas outside the exclosures begin to look like areas on the inside of an exclosure, there will be no improvement in hardwood shrub and tree communities, in the root strength and hydraulic roughness of herbaceous species, in maintaining or enhancing fish habitat needed to maintain or increase populations of management indicator species, in maintaining or enhancing water quality, in maintaining or protecting riparian dependent resources, or in attaining other standards specified within the LRMP.

11. Several allotments (Summit Prairie, Murderers Creek, and Blue Mountain) contain previously established livestock exclosures within riparian areas; these were reinspected during the 10/20-21/2004 field trip. These exclosures continue to provide a remarkable contrast

to conditions outside of their fences. On the inside, mature deciduous woody plants are more frequent, larger, and taller those outside of the exclosures. Young and intermediate height classes were present inside exclosures indicating successful recruitment of deciduous woody plants was an ongoing process. Outside of exclosures, the establishment of young woody browse species was rare to non-existent; overall densities are extraordinarily low. Thus, the exclosures continue to confirm that deciduous woody species have thrived and can continue to thrive along streams of the Malheur National Forest; that historical levels of browsing from livestock have caused major impacts to these plant communities; and that exceptionally high levels of utilization that has normally occurred outside the exclosures cannot be attributed to wild ungulates. If wild ungulates were having a significant impact on plant communities, such effects should have been readily observed on vegetation on the inside of the livestock exclosures—which they were not.

12. On the inside of the exclosures, herbaceous plants and litter provide continuous ground cover. When walking through the exclosures, surface soils were noticeably "soft" which is indicative of soils having high porosity and good structure. In contrast, bare ground is a common feature for many areas outside of exclosures and surface soils are comparatively "hard" due to years of compaction from livestock. Compacted soils are characterized by low porosity and poor structure (Heady 1975). The combined effects of bare ground and compacted soil cause decreased rates of infiltration during rainfall or snowmelt in areas outside of exclosures. Such conditions subsequently lead to decreased soil moisture for plant growth and increased surface runoff, as well as increased erosion from hillslopes.

13. Beaver dams were not found outside any of the exclosures, most likely because there is little to offer in the way of food (i.e., willows, alder, aspen). In contrast, beaver activity

relative to last year appears to be increasing at the Summit Creek exclosure (Summit Prairie Allotment, Sage Hen Unit) as six active beaver dams were noted within the fenced area (Only one beaver dam was found inside this exclosure when I inspected it in April 2004). Even though flows are normally low at this time of the year, overbank flow (due to ponding of water by the dam and the spreading of it across floodplain surfaces) was observed. For many low-gradient stream systems, beaver ponds are effective at increasing water availability to adjacent floodplains and meadows, thus increasing productivity and allowing them to support a wide variety of riparian plants. Reduced summertime water temperatures would be expected within the exclosure due to both (1) the relatively high levels of riparian shade from streamside woody species as well as (2) the relatively deep water in the ponds. In addition, these ponds are effective at trapping sediment during periods of high runoff and provide high quality rearing habitat (deep water, slow velocities, overhanging banks, shade) with plentiful cover for fish. In a recent review article, Pollock et al. (2003) indicate that for areas which have experienced a widespread loss of beaver dams, particularly those associated with semi-arid climates, such loss "may have exacerbated effects of other land use changes, such as livestock grazing, to accelerate incision and the subsequent lowering of groundwater levels and the ephemeralization of streams."

14. Field observations continue to indicate that exclosures have greater numbers of hardwood shrub and tree species, a greater range of height classes, and a wider spatial distribution than for hardwoods outside of an exclosure. For example, 35 discrete clumps of deciduous shrubs (mostly willow) were counted along a 100-ft reach of Summit Creek (representing a linear density of 1,800 shrubs/mile) where the water was being ponded by a single beaver dam; all were along the margins of the channel where they provided shade, bank

stability, and food web support for both aquatic and terrestrial species. In contrast, along the Malhuer River (Dollar Basin/Star Glade Allotment) where the floodplain is much broader, approximately 40 willows were are all that remained along a mile of channel.

15. In comparison to grazed areas outside of exclosures, there is much greater herbaceous cover on the inside of exclosures particularly along streambanks, thus indicating a greater root biomass for preventing stream erosion, allowing the development of overhanging banks, and insuring the deposition of fine sediments and organic material during periods of overbank flows. Channels inside exclosures are narrower, continue to develop increased sinuosity, have a greater potential for trapping sediments along streambanks (i.e., building streambanks over time), have greater pool depths and channel diversity, and continue to recover from the long-term effects of historical livestock grazing. Overall, the ecological integrity, the productivity of hardwood and herbaceous plants, and the multiple beneficial effects to a wide range of riparian dependent resource values (i.e., RMOs and ORVs) are much greater inside exclosures than in adjacent areas outside of the exclosures.

16. The existing scattered exclosures provide fundamental information regarding plant community responses and rates of channel recovery when intense grazing/browsing pressure is removed. Nevertheless, the existing exclosures are too few in number and too small in area. They obviously cannot represent the full range of stream sizes, floodplains, gradients, and other factors that can affect recovery potential (Kovalchik 1987). If grazing were to again occur on any of the rested allotments, it would be important for the Malheur National Forest to utilize monitoring resources to establish additional (and larger) riparian exclosures in each allotment to not only assess rates of recovery (associated with livestock removal) but also as a basis of comparison for assessing the recovery, or lack thereof, on areas where grazing was

reinitiated. However, this is not to say that each of the allotments within the Malheur and North Fork Malheur wild and scenic river corridors and their watersheds do not need multiple years of complete rest from livestock grazing in order to initiate and move toward recovery of RMOs.

17. While the number and size of exclosures in allotments of the Malheur National Forest is relatively small, the exclosures nevertheless confirm that deciduous woody plants are an important and common part of riparian plant communities. In contrast, areas outside of exclosures that were visited on our 10/20-21/2004 field trip (e.g., Dollar Basin/Star Glade Allotment, Dollar Basin Unit, Malheur W&S River; North Fork Allotment, South River Unit, North Fork of the Malheur W&S River) consist essentially of scattered solitary plants, or none at all. The fact that the Forest Service has deemed it necessary to install wire cages around the few remaining willows along the Malheur Wild and Scenic River (Dollar Basin/Star Glade Allotment, Dollar Basin Unit) confirms that these species are in trouble as a result of previous grazing practices. While such efforts may help to save these few plants and allow them to grow, mature, and eventually produce seed, isolated willow cages around established plants provide no protection to any seedlings or root sprouts that occur in the future. Thus, the establishment and growth of deciduous species will continue to be prevented if grazing were to resume on this allotment or any other allotment that has been rested.

18. In conclusion, for those allotments observed during the field trip of October 20-21, 2004 and where grazing had occurred in the summer of 2004, current grazing practices are continuing to adversely impact riparian functions, water quality, and fisheries habitat. Even where units were rested and stubble heights for the current grazing season are not a contention, the high proportion of eroding banks, the high width/depth ratios of existing channels, and the lack of young deciduous species indicate that the degraded condition of riparian and aquatic

systems continues to adversely affect ORVs, prevent attainment of INFISH RMOs, and does not meet riparian vegetation requirements, as specified in the Malheur National Forest LRMP. Because of the extent and severity of degradation to riparian plant communities, stream channels, water quality, and fisheries habitat from historical grazing practices, many years of total exclusion will be required to establish a pattern of recovery.

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

DATED this 8 day of November, 2004.

Robert L Beschta

Robert L. Beschta, Ph.D.

Literature Cited

Chaney, E., W. Elmore, and W.S. Platts. 1990. Livestock grazing on western riparian areas. US Government Printing Office, Washington, D.C.

Dwire, K.A., B.A. McIntosh, and J.B. Kauffman. 1999. Ecological influences of the introduction of livestock on Pacific Northwest Ecosystems. Pages 315-335 in D.D. Goble and P.W. Hirt (eds), Northwest Lands and Peoples: Readings in Environmental History, University of Washington Press, Seattle.

Heady, H.F. 1975. Chapter 4. Physical effects of grazing animals. Pages 54-66 in Rangeland Management. McGraw-Hill Book Company, New York.

Kauffman, J.B., Bayley, P., Li, H., McDowell, P., and Beschta, R.L., 2002. Research/Evaluate Restoration of NE Oregon Streams: Effects of livestock exclosures (corridor fencing) on

riparian vegetation, stream geomorphic features, and fish populations. Final Report to the Bonneville Power Administration, Portland, OR

Kovalchik, B.L. 1987. Riparian zone associations; Deschutes, Ochoco, Fremont, and Winema National Forests. USDA Forest Service, Pacific Northwest Region, R6 ECOL TP-279-87. 171 pp.

Ohmart, R.D. 1996. Chapter 16. Historical and present impacts of livestock grazing on fish and wildlife resources in western riparian habitats. Pages 245-279 in P.R. Krausman (ed), Rangeland Wildlife, Society for Range Management, Denver, Colorado.

Platts, W.S. 1991. Livestock grazing. In W.E. Meehan (ed), Influences of Forest and Rangeland Management on Salmonid Fishes and their Habitats. American Fisheries Society Special Publication 19, Bethesda, Maryland.

Pollock, M.M., M. Heim, and D. Werner. 2003. Hydrologic and geomorphic effects of beaver dams and their influence on fishes. American Fisheries Society Symposium 37: 1-21.