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Attorneys for Plaintiffs

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF OREGON

OREGON NATURAL DESERT ASS'N, **CENTER FOR BIOLOGICAL DIVERSITY**, and **WESTERN WATERSHEDS PROJECT**,

Plaintiffs,

v.

ABIGAIL KIMBELL, Chief, U.S. Forest Service, **GARY L. BENES**, Supervisor, Malheur National Forest, **UNITED STATES FOREST SERV.**, **D. ROBERT LOHN**, Regional Administrator, Nat'l Marine Fisheries Serv., **NAT'L MARINE FISHERIES SERV.**, **DAVID R. ALLEN**, Regional Director, U.S. Fish & Wildlife Service, **GARY S. MILLER**, Field Supervisor, U.S. Fish & Wildlife Service, **U.S. FISH & WILDLIFE SERV.**,

Defendants,

Case No. 07-1871-KI

DECLARATION OF JONATHAN RHODES

I, JONATHAN J. RHODES, state and declare as follows:

1. My name is Jonathan J. Rhodes. I am a hydrologist with more than 26 years of experience. I have a B.S. in hydrology and water resources from the University of Arizona, a M.S. in hydrology and hydrogeology from the University of Nevada-Reno, and finished all required academic work toward a Ph.D. candidacy in forest hydrology at the University of Washington.

2. For the past five years, I have worked as a consulting hydrologist, working on a broad array of watershed issues for a variety of clients, including local governments in Washington and Oregon. My professional experience includes work for tribal, federal, state, county, and city governments, universities, and non-profit groups in eight western states, including more than 12.5 years at the Columbia River Inter-Tribal Fish Commission (CRITFC), where I served as Senior Scientist-Hydrologist.

3. For more than 20 years, I have examined silvicultural, grazing, road building, and other activities that affect stream conditions, fish habitat, and water quality. I have developed and implemented programs to monitor streams and water quality in a variety of areas throughout the West. Most of my work has focused on the effects of land management activities, including livestock grazing, on water quality, streams, and habitats for salmonids and other aquatic species.

4. During my tenure at CRITFC, our work with the U.S. Forest Service (USFS) provided the groundwork for most of the substantive watershed protection measures ultimately adopted—albeit in a diluted form—by the USFS and U.S. Bureau of Land Management (BLM) in two combined agency management strategies designed to limit the decline in habitats for anadromous and resident salmonids, including steelhead and bull trout, in the Columbia River basin: "Implementation of Interim Strategies for Managing Anadromous

Fish Producing Watersheds in Eastern Oregon and Washington, Idaho, and portions of California" ("PACFISH") and "Inland Native Strategies for Managing Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana, and Portions of Nevada" ("INFISH").

5. I have published extensively. Most of my publications have focused the effects of land use on streams and the survival and production of trout and salmon. I am the primary author of a peer-reviewed paper examining the instream effects of fine sediment levels on anadromous fish survival in streams in the Blue Mountains of Oregon (Rhodes and Purser, 1998) and "A Coarse Screening Process For Potential Application In ESA Consultations," a peer-reviewed report developed under contract with NOAA Fisheries, otherwise known as the National Marine Fisheries Service. This report included an extensive review of available scientific information on the effects of grazing on anadromous fish habitats. I have also served as a peer reviewer for the North American Journal of Fisheries and the proceedings of an international symposium on the effects of land use on fish habitat.

6. Over the past 18 years, I have performed field evaluations of the effects of grazing on watersheds, streams, and embedded fish habitats as a routine part of my work. From 1998 to 2001, I was the primary investigator for government-funded research in Oregon, Washington, and Idaho, comparing the effects of grazing versus no grazing on a variety of stream and salmonid habitat attributes, including those set as Riparian Management Objectives INFISH and PACFISH (Rhodes and Greene, in process). I estimate that I have evaluated conditions in a professional capacity on more 200 grazing allotments on more than 19 western national forests.

6. I am extremely familiar with the watersheds in the Murderers Creek Allotment (MCA) and the Lower Middle Fork Allotment (LMFA). I have repeatedly performed numerous extensive field inspections of allotment conditions on LMFA and MCA on the Malheur National Forest (MNF) since 1990. Indeed, some of the results of my field monitoring in the LMFA were published in the scholarly peer-reviewed journal BioScience (Karr et al., 2004). I am also the primary author/director of a video (Rhodes et al., 1993) presented at the 1993 annual national meeting of the American Fisheries Society, which chronicled damage to steelhead habitat by grazing on the MNF, including the area within the MCA and the LMFA.

Information Reviewed

7. I reviewed the detailed notes and photographs that I took during my personal surveys and evaluations of grazing impacts on stream, fish habitat, and watershed conditions in the MCA in April 2003, October 2003, October 2004, October 2006, and, most recently on October 20, 2007. I also reviewed my detailed notes and photographs that I took during my field evaluation of grazing impacts on stream grazing impacts on stream, fish habitat, and watershed conditions in the watersheds of the LMFA in August 2005, and, most recently on October 19, 2007. I took all the photos taken during field evaluations in October 2007 that are attached to this declaration in Attachment A. The photos attached as Attachment A are a true and accurate depiction of the streams and areas within the MCA and LMFA that I evaluated in October 2007.

8. I have reviewed the photographs and data from measurements taken by Christopher Christie documenting bank alteration and bank instability on the LMFA and MCA in October 2007. I also reviewed the results of the detailed, site-specific monitoring of stream bank conditions in and outside of grazing exclosures on the Murderers Creek in the MCA collected in 1999 as part of government-funded research on the effects of grazing on steelhead and salmon

(Rhodes and Greene, *in process*). I also reviewed my notes, annotated photos, and video taken during my many other field inspections of conditions in the MCA and LMFA, which date back to 1990. I also reviewed other pertinent scientific literature. The list of this scientific literature is too lengthy to list here, so I have listed it at the end of this declaration. In my review, I also drew on my professional judgment and experience, including my extensive experience evaluating conditions in the LMFA and MCA for almost two decades.

Scope of Review

9. I submit this declaration to describe how the impacts of livestock grazing have affected bank alteration and bank instability in the LMFA and MCA, based my recent observations of grazing impacts and stream conditions during my October 2007 field review. Grazing has and continues cause significant bank alteration well in excess of 20% in many streams within these two allotments. Livestock grazing in these allotments continues to damage and suppress riparian vegetation along streams in the allotments, rendering the banks extremely vulnerable to bank alteration by livestock grazing.

10. I also review of the Christie monitoring data for bank alteration and bank instability, including whether these data are scientifically sound, based on the methods employed and the results. I also evaluate whether these data adequately and accurately document and assess bank alteration and bank instability in streams where Christie made the measurements in the LMFA and MCA in the fall of 2007.

Assessment of the Christie Monitoring Data for Bank Damage and Bank Stability

11. The measurements of bank alteration and bank instability made by Christie are based on the measurement methods, criteria, and analysis protocols in publications by the USFS (Platts et al., 1987), USEPA (Bauer and Burton, 1993), BLM (Cowley, 2002) and NOAA

Fisheries (Murray et al., 2004). Banks were classified as stable or unstable using the criteria of Platts et al. (1987) and Bauer and Burton (1993).[1] Altered banks were classified as altered or unaltered based on the criteria in (Cowley, 2002).

12. Bank alteration, as discussed in this declaration and determined in my measurements and observations, as well as those of Christie, is the bank damage caused by bank shearing or trampling on stream banks. Bank shearing is caused animal hooves shearing, chiseling, or breaking off stream banks, immediately widening the stream channel (Cowley, 2002), often leaving remaining banks oversteepened, devegetated, and highly vulnerable to additional erosion and loss by streamflow. Bank trampling is when animal hooves damage stream banks by flattening them or sinking, displacing, or exposing stream bank soils or the roots of deep-rooted vegetation.[2] Trampling de-stabilizes banks making them highly vulnerable to bank erosion and thwarting the development of stable overhanging banks that are essential to steelhead, as noted in publications by the USFS (Platts, 1991), USEPA (Bauer and Burton, 1993), NOAA Fisheries (Murray et al., 2002) and a host of other scientific literature (e.g., Fleischner 1994; Rhodes et al., 1994).

[1] Unstable banks, as discussed in this declaration, determined in my observations and measurements, and those of Christie, are banks that are significantly altered based on the criteria in (Cowley, 2002), nearly vertical (having an angle between 80 and 100 degrees with the horizontal) and devegetated, broken down, slumping, and/or fractured as described in the USEPA publication (Bauer and Burton, 1993), which, in turn, is based on a simplification of the criteria in the USFS plubication, Platts et al. (1987)

[2] In my monitoring, field observations, and discussion in this declaration, as well as the monitoring of Christie, banks are considered altered by trampling if they meet any of the following criteria of Cowley (2002): 1) trampling occurred within the one foot bank width, resulting in depressions and/or soil displacement upwards at least ½ inch or impressions at least ½ inch deep that expose the soil or roots of early seral species, such as Kentucky bluegrass and brook grass; 2) severe trampling and trailing that compacts the soil even though it may not display ½ inch deep depressions; or, 3) in areas with deep-rooted vegetation, such as sedges, trampling that exposes/displaces soils or exposes the root systems of deep-rooted vegetation.

13. Concurrent with measurements of bank alteration and bank instability, Christie recorded detailed information on monitoring locations, augmented with photos annotated with detailed observations from the monitored areas.

14. I reviewed the results of Christie's monitoring of bank alteration and bank instability on streams, particularly those that I personally evaluated in October 2007, including Murderers Creek, the South Fork Murderers Creek, Deer Creek, Thorpe Creek, and Beaverdam Creek in the MCA and Coyote Creek in the LMFA. The results of Christie's monitoring of bank alteration and bank instability on these streams are entirely consistent with what I observed during my October 2007 field evaluation. For these combined reasons, the Christie's measurements of bank alteration and bank instability meet professional standards for determination of these bank conditions and are sound and reliable.

Bank Alteration and Bank Instability on Streams in the Murderers Creek Allotment

15. During my October 2007 field review I observed that the grazed streams in the MCA that I examined had bank alteration that was consistently well in excess of 20%, caused by livestock trampling of stream banks. The streams where I witnessed bank alteration much greater than 20% include the South Fork Murderers Creek, Beaverdam Creek, Thorpe Creek, and Deer Creek. As has been the consistent case in my previous field reviews, bank alteration by livestock was severe and far higher than 20% on the South Fork Murderers Creek in the wet meadows in John Young Meadows upstream of the fenced area on state lands and in the area flanking the crossing of the creek by the 2480-209 road. See Attachment A, photos 1 and 2.

16. The measurements of bank alteration by Christie corroborate my observations that bank alteration was well in excess of 20% on streams subjected to grazing throughout the MCA. Christie's measurements document that bank alteration ranged from 30-83% in all grazed

streams that were monitored. See Christie Declaration at Table 1. Christie's results are entirely consistent with my observations during my October 2007 field evaluation of streams in the MCA. Therefore, it is very obvious that bank alteration in many streams subjected to grazing in 2007 in the MCA was consistently and significantly greater than 20%.

17. It is well-documented that bank alteration strongly contributes to bank instability and resulting damage to aquatic habitats, streams, and water quality (Platts, 1991; Bauer and Burton, 1993, Fleischner 1994). For instance, my monitoring of bank conditions in October 2006 and October 2007 on streams on the MNF in the Middle Fork John Day, North Fork Malheur River, and Malheur River watersheds, using the same methods as Christie employed in the MCA, demonstrate bank alteration contributes significantly to bank instability, as shown in Figure 1. below:

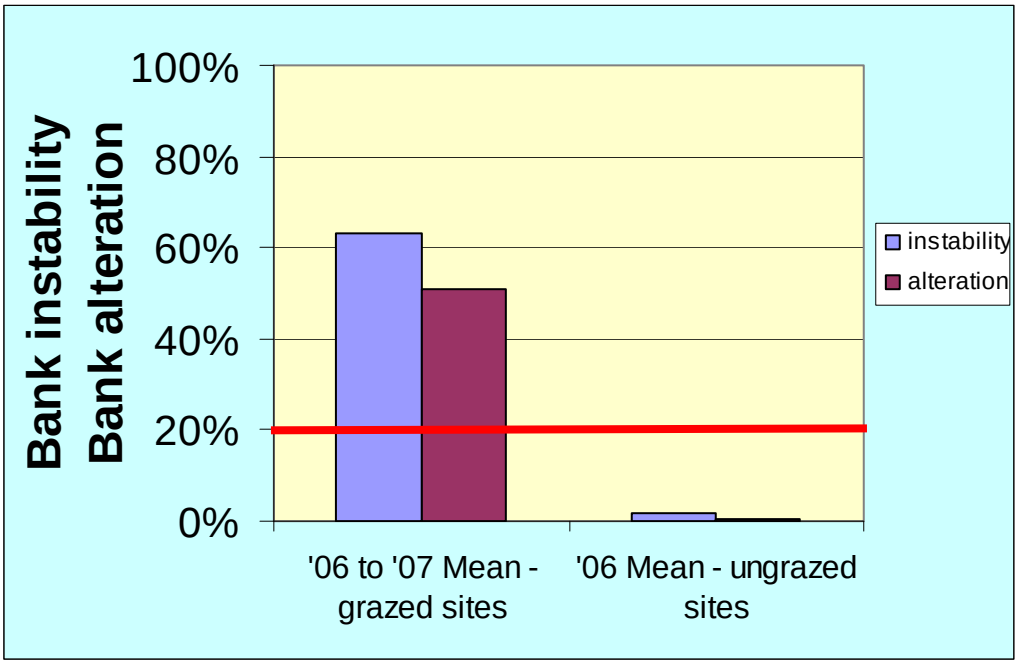

Figure 1. The results of my measurements of bank instability and bank alteration on streams in the Middle Fork John Day, North Fork Malheur River, and Malheur River watersheds. The data is expressed as the mean (average) of the results from 10 measurements in grazed reaches from 2006 to 2007 and three ungrazed reaches in exclosures. These results demonstrate that bank alteration contributes significantly to

bank alteration. They also demonstrate that bank alteration and bank instability are far lower in areas where streams have been protected from livestock grazing for more than a decade. The horizontal red line in the chart highlights the threshold of 20% bank alteration.

18. These findings are wholly consistent with the available scientific information and are predictable given existing conditions in the MCA. The banks of most of the streams of the MCA are highly vulnerable to bank alteration from livestock trampling, because the combined impacts of grazing has eliminated and suppressed deep-rooted vegetation on the banks that stabilizes the banks and reduces bank damage from livestock trampling. See Attachment A, photos 1 and 2. Publications by the USFS (Platts, 1991), USEPA (Bauer and Burton, 1993), NOAA Fisheries (Murray et al., 2002) and a host of other scientific literature (e.g., Fleischner 1994; Rhodes et al., 1994) have noted that the loss of deep-rooted vegetation makes stream banks more susceptible to alteration, damage, and erosion.

19. The stream banks on many streams in the MCA are comprised of soils that are highly vulnerable to bank alteration when trampled. Trampling by cattle exert a tremendous force on banks. The BLM (Cowley, 2002) estimated that cattle exert more than five times the pressure per square inch on banks and soils than does a D-9 Caterpillar tractor. The net result is that livestock grazing in the MCA consistently caused more than 20% bank alteration on affected streams, as I observed in my October 2007 field review, corroborated by the data of Christie.

20. Grazing management in the MCA makes significant bank alteration to streams inevitable because cattle are grazing the allotment during the hot summer season. Grazing impacts and cattle are concentrated in riparian areas during the summer, as many assessments have repeatedly documented, including those of the USFS (Platts et al., 1991), BLM (Leonard et al., 1997), and NOAA Fisheries (Murray et al., 2004). This increases the duration, extent, and

severity of grazing damage to banks, streams and riparian areas. NOAA Fisheries stated, "Livestock tend to spend more time in riparian areas and consume more riparian vegetation in the summer months. Most authors agree that grazing without close control of livestock during the summer is detrimental to riparian areas . . ." (Murray et al., 2004). The USFS and BLM's own publications on grazing management have repeatedly indicated that grazing during the summer season is not compatible with the recovery of stream banks, riparian and stream conditions amenable to fish survival (e.g., Platts, 1991; Kovalchik and Elmore, 1991; Leonard et al., 1997).

21. There is no doubt that this bank alteration and other effects of cattle grazing are causing high levels of bank instability and preventing the recovery of bank stability in the MCA, as I observed during my October 2007 field evaluation, as well as my other field evaluations in the MCA in I April 2003, October 2003, October 2004, October 2006. This is clearly demonstrated by the trend and condition banks in the reach of Murderers Creek in the Oregon Mine Unit, downstream of the fenced state lands, near the Oregon Mine Camp. This unit has been rested from grazing in at least of two years of four years from 2003 to 2006 and in at least three of five years from 2003 to 2007. It is likely that it has not been subjected to significant grazing for the five years from 2003 to 2007. Bank instability data for this reach of Murderers Creek from 1999 to 2007[3] shows that with rest from significant grazing and attendant bank alteration over the course of five years, bank instability in this reach has been consistently reduced via natural recovery as shown in Figure 2:

[3] I collected the data from 1999 as part of a government-funded regional study of grazing impacts on streams. In 1999, the stream been subjected to grazing on annual basis, for many years. I also collected the data in 2006. The 2007 data was collected by Christie.

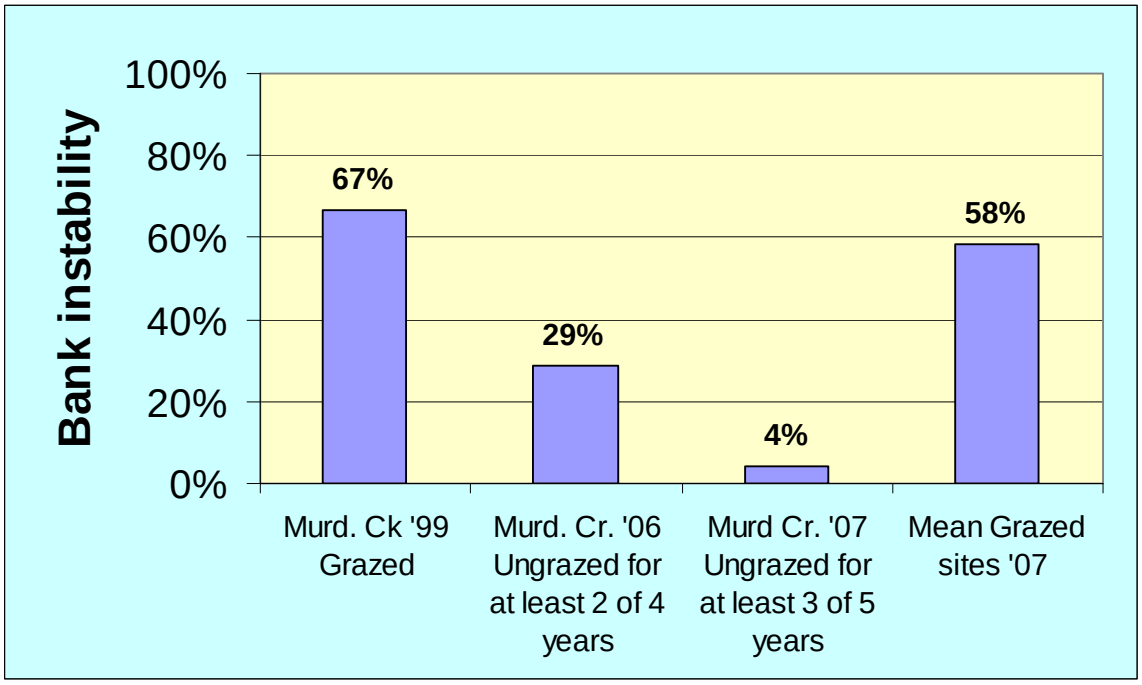

Figure 2. Measured bank instability from 1999 to 2007 on Murderers Creek in the Oregon Mine Unit downstream of fenced state lands and mean bank instability in 17 grazed areas in the MCA in 2007. The data clearly show that in the absence of significant annual bank alteration from livestock grazing on this reach of Murderers Creek, there has been a significant improvement in bank instability due to natural recovery of vegetation and banks. This recovery in bank instability in the rested reach is in strong contrast to existing conditions in areas subjected to grazing in 2007 in the MCA where bank alteration was greater than 20%. This clearly indicates that grazing and resulting bank alteration is preventing the recovery of bank stability.

22. The data in Figure 2 clearly demonstrate that although this reach of Murderers Creek had been significantly degraded by grazing in 1999 with high levels of bank instability, rest from grazing has allowed the stream to rapidly recover with respect to bank stability. As a result, bank instability in 2007 was less than 1/15th of what it had been in 1999 and less than 1/7th of what it had been in 2006. The data also demonstrates that bank instability remains extremely high in all grazed reaches where bank instability was measured in the MCA in the fall of 2007, clearly indicating that bank alteration by livestock grazing is preventing the recovery of bank conditions in the MCA. The data show that bank instability in this rested reach of Murderers Creek in the MCA is less than 1/14th of the mean bank instability in streams in the MCA that

have continued to be subjected to cattle grazing. This is also corroborated by comparing the mean measured bank instability of 58% in the MCA in 2007 with the mean measured bank instability of 1.9% in ungrazed sites in 2006, as shown in Figure 1.

23. There is no doubt that levels of bank alteration and bank instability in grazed streams in the MCA is contributing to the degradation of steelhead habitats in ways that reduce the survival and production of steelhead. Unstable banks greatly elevate sediment delivery to streams (Platts, 1991; Bauer and Burton, 1993; Rhodes et al., 1994; Cowley, 2002). Increased sediment delivery degrades steelhead habitats by elevating fine sediment levels, reducing pool quality and volume, inhibiting pool development, and increasing the width/depth ratios of streams (Meehan, 1991; USFS et al., 1993; Rhodes et al., 1994; Henjum et al., 1994; Buffington et al., 2002; Beschta et al., 2004). These impacts significantly reduce the survival and production of steelhead (Meehan, 1991; Waters, 1995; Suttle et al., 2004; Beschta et al., 2004). Available research indicates that any increase of fine sediment harms steelhead production (Suttle et al., 2004). This is significant because elevated sedimentation is a widespread problem in streams draining the MCA.

24. Bank alteration, bank instability and consequent elevated bank loss contributes to increased width/depth ratios in streams subjected to grazing, as corroborated by many studies and assessments (Platts, 1991; Bauer and Burton, 1993; Rhodes et al., 1994; Knapp and Matthews, 1996; Belsky et al., 1999; Cowley, 2004), including studies conducted in the MNF within the MCA (Magilligan and McDowell, 1997; Kauffman et al., 2002; Rhodes and Greene, *in process*). Increases in stream width/depth ratio contribute to elevated water temperatures (Rhodes et al., 1994; McCullough, 1999; Bartholow, 2000; Beschta et al., 2004). Notably, elevated width/depth ratios and elevated water temperature are already major problems for

steelhead survival and production in streams affected by grazing in the MCA.

25. Bank alteration also reduces overhanging banks and prevents their recovery (See Figures 3 and 4). Overhanging banks are an essential aspect of steelhead habitat. Notably, the dearth of overhanging banks is a major problem afflicting steelhead habitats in streams affected by grazing in the MCA. Therefore, the bank alteration and bank instability in the MCA is degrading aquatic habitats and water quality in ways that reduce the survival and production of steelhead. As a BLM publication (Cowley, 2002) on stream alteration noted "It is well documented that large herbivores such as cattle, horses, sheep, bison, elk, and moose can alter the physical dimensions (e.g., increasing the bankfull width) of stream channels by bank trampling and shearing…Increasing the bankfull width makes the stream shallower, increases sediment, decreases the floodplain, increases temperature, and increases the adverse affects the physical functioning of a stream, its associated riparian area, and aquatic habitat…"

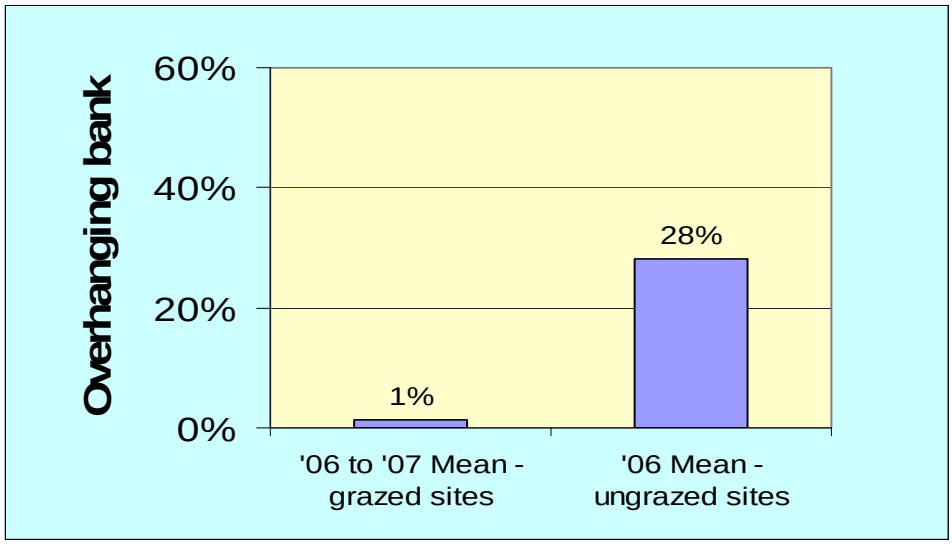

Figure 3. Mean measured overhanging banks on streams in the Middle Fork John Day, North Fork Malheur River, and Malheur River watersheds. The data are for 10 grazed reaches measured in 2006 and 2007 and three ungrazed reaches in exclosures. These results show that grazing has reduced the level of overhanging banks essential to steelhead and prevented its recovery. The amount of overhanging banks is about 28 times higher in

areas where streams have been protected from livestock grazing than in on streams that continue to be subjected to grazing.

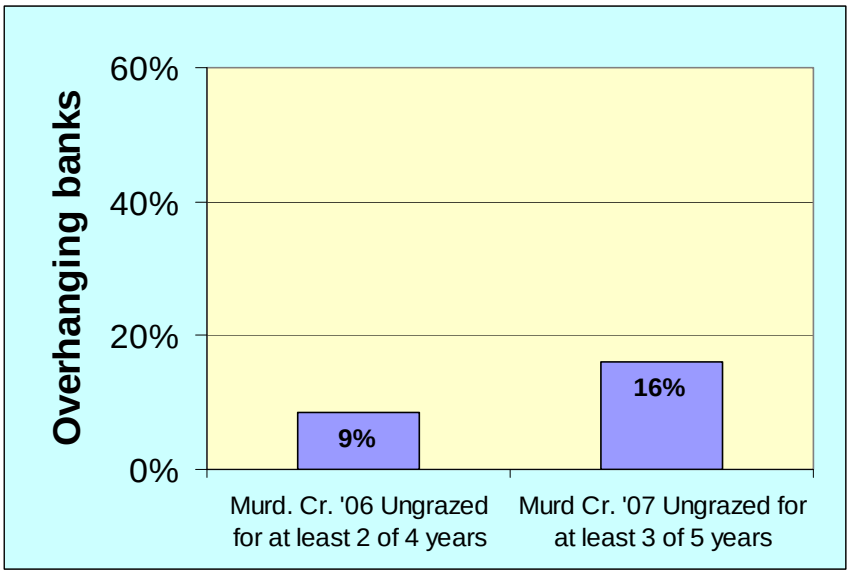

Figure 3. Measured amount of overhanging banks in 2006 and 2007 on Murderers Creek in the Oregon Mine Unit downstream of fenced state lands. The data clearly show that in the absence of significant annual bank alteration from livestock grazing, there has been a significant improvement in the amount of overhanging banks, almost doubling in the course of one year. This recovery in overhanging banks is in strong contrast to existing conditions in areas subjected to grazing (See Figure 3). This clearly indicates that grazing and resulting bank alteration is preventing the recovery of overhanging banks.

26. Arresting and reversing the damaged bank conditions in the MCA will require at least several years of rest from grazing. The banks are extremely damaged and highly vulnerable to bank alteration from trampling. Many of the streams in the MCA have banks that cannot be subjected to significant livestock grazing without causing high levels of bank alteration that damage water quality and steelhead habitats, preventing the recovery of bank stability, water quality, and steelhead habitats. The only livestock management strategy compatible with the unimpeded recovery of these highly damaged streams is multi-year suspension of grazing, as many assessments of grazing impacts on salmonids have repeatedly concluded (e.g. Anderson et al., 1993; Platts, 1991; Rhodes et al., 1994).

27. Numerous scientific assessments of the effect of grazing on riparian and stream recovery have concluded that at least several years of grazing rest is warranted to allow recovery of degraded riparian and stream systems, including assessments by USFS's own experts on aquatic impacts and grazing effects on aquatic resources (Clary and Webster, 1989; Platts et al., 1991; USFS and BLM, 1997). Evaluations of habitat conditions for imperiled steelhead affected by grazing, at scales ranging from the reach to the regional, have repeatedly recommended the temporary or permanent elimination of riparian grazing in degraded riparian areas in order to initiate and/or accelerate the recovery of riparian vegetation, channel conditions, and fish habitat conditions, especially in degraded areas (Clary and Webster, 1989; Beschta et al., 1991; Anderson et al., 1993; Henjum et al., 1994; Rhodes et al., 1994; Beschta et al., 2004; Karr et al., 2004). Skovlin (1984, as cited in Clary and Webster, 1989) recommended at least five years of rest for degraded areas prior to re-introducing grazing under proper management. As a USFS and BLM publication (Leonard et al., 1997) states (emphasis added):

> "Livestock grazing in riparian areas, however, may not always be entirely compatible with other resource uses or values. Where soils in riparian areas are unstable, the vegetation complex is fragile, threatened and endangered plants and/or animals are affected, aquatic or recreation values are high, municipal watersheds are involved, etc., special livestock management prescriptions must be applied. In some cases, **excluding livestock grazing may be the most logical and responsible course of action** (at least for a time sufficient to achieve a level of recovery and stability that can support grazing in the context of the management objectives)."

Notably, the grazed riparian areas and streams in the watersheds of the MCA meet at least one or

more these criteria. Plainly, available scientific information, including that of the USFS and data from the MCA, clearly indicates that several years of rest from grazing is needed in the MCA in order to allow the recovery of bank conditions.

Bank Alteration and Bank Instability on Streams in the Lower Middle Fork Allotment

28. I observed that many grazed streams in the MCA that I examined during my October 2007 field review had bank alteration well in excess of 20%, caused by livestock trampling of stream banks. The streams where I witnessed bank alteration much greater than 20% include reaches of Wray Creek, Coyote Creek, Mosquito Creek, and Big Boulder Creek. See Attachment A, photos 3 through 8.

29. The measurements of bank alteration by Christie corroborate my observations that bank alteration was well in excess of 20% on Coyote Creek. Christie documented that in October 2007 that Coyote Creek had bank alteration of 59%. See Christie Declaration at ¶ 22. This is completely consistent with my observations in October 2007. See Attachment A, photos 5 and 6. It is also completely consistent my monitoring of bank conditions of streams in the Middle Fork John Day, North Fork Malheur River, and Malheur River watersheds as shown in Figure 1 and described in the caption for the Figure 1.

30. It is also clear from Christie's data that bank alteration in Dry Creek was greater than 20%. Christie documented that bank alteration on Dry Creek was 53% in the fall of 2007. See Christie Declaration at ¶ 22.Although I did not evaluate Dry Creek in 2007, I have evaluated the stream many times in the past and have consistently found extremely high levels of bank alteration from livestock grazing due to the susceptible banks, lack of riparian vegetation, and easy access by cattle, combined with the concentration of livestock that occurs with the grazing during the hot summer season.

31. High levels of bank alteration on streams in the LMFA from summer livestock grazing are inevitable due to bank and riparian conditions. Many of the streams in LMFA are highly vulnerable to bank alteration from livestock trampling due to the lack of deep-rooted vegetation caused by livestock grazing and the soils that comprise the banks, as I observed in field evaluations of these streams in August 2005 and October 2007. See Attachment A, photos 3 through 8.

32. Current grazing management also makes significant bank alteration in the LMFA inevitable, because cattle graze the allotment during the hot summer season. As previously discussed, grazing during the summer season increases bank alteration due to the concentration of livestock in riparian areas during the summer. Grazing during the summer season is incompatible with the recovery of stream banks, riparian and stream conditions amenable to fish survival, as a host of assessments concluded, as previously discussed.

33. Bank alteration and other effects of cattle grazing are preventing the recovery of bank stability and overhanging banks in the LMFA as previously discussed and shown in Figures 1 through 4. Many of the stream reaches within the allotment are almost completely lacking overhanging banks, including parts of lower Big Boulder, Wray, Elk, Deep, Dry, and Beaver creeks, as I observed during my field reviews in August 2005 and October 2007.

34. The bank alteration and bank instability in the LMFA degrade steelhead habitat, water quality, and streams in several ways that reduce the survival and production of steelhead. Unstable, altered banks increase bank erosion and sediment delivery to streams which contribute to elevated sedimentation, channel widening (increased width/depth ratio) and loss of pool quality and volume. Channel widening, in turn, contributes to elevated stream temperatures. It is extremely well-documented that all of these impacts degrade salmonid habitats and separately,

and in concert, reduce salmonid survival (Meehan, 1991; Rhodes et al., 1994). The dearth of pools, elevated width/depth ratios, sedimentation, and elevated water temperature are already major problems for salmonid survival on the LMFA and downstream in the Middle Fork John Day River, which is cumulatively affected by stream conditions in the LMFA.

35. As is the case with the MCA, arresting and reversing the damaged bank conditions in the LMFA will require at least several years of rest from grazing. This is because the existing banks are extremely damaged and highly vulnerable to bank alteration from trampling. It is also corroborated by the existing conditions and trends in bank conditions and available scientific information. Many of the streams in the LMFA have banks that cannot be subjected to significant livestock grazing without causing high levels of bank alteration that damage water quality and steelhead habitats and prevent the recovery of bank stability, water quality, and steelhead habitats.

Summary and Conclusions

36. My observations during my October 2007 field evaluations indicate that bank alteration was much greater than 20% in streams subjected to grazing in 2007 in the MCA and in many streams in the LMFA. My observations are corroborated by the measurements of Christie, which meet professional standards and reliably reflect bank conditions in the fall of 2007. These results are predictable due to summer grazing by livestock coupled with the existing, damaged bank conditions in the MCA and LMFA. This documented bank alteration is entirely consistent with available scientific information on the impacts of summer livestock grazing on vulnerable stream banks lacking deep-rooted vegetation, as is the case in the MCA and LMFA.

37. The bank alteration in the MCA and the LMF is preventing the recovery of bank stability as reliably demonstrated by data from the MCA as summarized in Figures 2 and 4 and

other data from grazed areas on the MNF, as summarized in Figures 1 and 3. These data are completely consistent with available scientific information on the impacts of summer livestock grazing on vulnerable stream banks lacking deep-rooted vegetation, as is the case in the MCA and LMFA.

38. Available scientific information and conditions in the LMFA and MCA indicate that the bank alteration and bank instability that I observed during my October 2007 and corroborated by the measurements of Christie are negatively affecting water quality, stream conditions, and steelhead habitats. Available scientific information amply demonstrates that these negative effects contribute significantly to the reduced survival and production of steelhead.

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 30th day of March 2008.

__s/ Jonathan J. Rhodes_____

Jonathan J. Rhodes

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