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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, *et al.*,

Defendants,

v.

HARLEY & SHERRIE ALLEN, *et al.*,

Defendants-Intervenors.

Case No. 07-1871-HA
[Related Case No. 08-151-HA]

FOURTH DECLARATION OF JONATHAN J. RHODES

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

1. My name is Jonathan J. Rhodes. I am the same Jonathan J. Rhodes who submitted a first, second, and third declaration in this case. My qualifications are described in my first declaration.

2. I am quite familiar with the watersheds in the Hamilton/King, Long Creek, Slide Creek, Upper Middle Fork, Fox, and Mt. Vernon/ John Day/Beech Allotments. I have performed numerous extensive field inspections of the conditions of these allotments and the streams that drain them on the Malheur National Forest (MNF) since 1990.

Information Reviewed

3. In my previous three declarations I listed and described the material that I had reviewed at that time. Since then, I have also reviewed the Third Christie Declaration and Attachments and the MNF's "2008 End of Year Grazing Report For The Blue Mountain Ranger District Of The Malheur National Forest," dated January 7, 2009 (EOYR).

4. 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 grazing allotments on the MNF for almost two decades.

Scope of Review

5. I submit this declaration to discuss the impacts of livestock grazing on bank alteration based on available data from streams in following allotments: Hamilton/King (HKA), Long Creek (LCA), Slide Creek (SCA), Upper Middle Fork (UMFA), Fox (FA), Mt. Vernon/John Day/Beech (MVJDBA). I describe how the impacts of livestock grazing on bank alteration and bank instability in streams in affect stream conditions, fish habitats, and fish

populations.

6. I also review of the monitoring data for bank alteration in the Third Christie Declaration and Attachments. I describe the methods used to collect these data and assess whether these data are scientifically sound.

7. I also discuss why continued livestock grazing of these allotments is likely to continue to adversely affect the riparian and stream conditions and the survival and production of steelhead that inhabit streams affected by grazing. I also discuss how rest from grazing benefits riparian areas, streams, and steelhead survival and production.

. **The Bank Alteration Data in the Christie Declaration are sound and reliable**

8. As the Third Christie Declaration (p. 7, ¶ 14) notes, the bank alteration measurements in the Third Christie Declaration were collected using the most recent guidance by the USFS and BLM for monitoring bank conditions in grazed areas (Burton et al., 2008). These bank alteration data were collected using the same methods, criteria, and analysis protocols in Burton et al. (2008). Prior to collecting the bank alteration data summarized in the Third Christie Declaration, Christie also attended multi-day training on the use of the monitoring methods of Burton et al. (2008) (Third Christie Declaration, pp. 6-7, ¶ 13).

9. Concurrent with measurements of bank alteration and bank instability, Christie recorded detailed information on monitoring locations, augmented with photos and observations from the monitored areas (Third Christie Declaration, p. 8, ¶ 15 and Attachments). The summary data in the Third Christie Declaration (pp. 9, 10, Table 1, ¶ 18) are augmented with additional information, including location description, raw data, and the number of individual measurements of bank alteration collected, for each area where bank alteration was measured (Third Christie Declaration Attachments).

10. For these combined reasons, the Christie's measurements of bank alteration clearly meet professional standards for measuring bank alteration on streams subject to livestock grazing and are sound and reliable.

Bank Alteration Levels on Streams in the HKA, LCA, SCA, UMFA, FA, and MVJDBA

11. Christie measured bank alteration on 14 reaches in the HKA, LCA, SCA, and UMFA. These bank alteration data ranged from 15 to 47%, demonstrating that bank alteration was consistently 15% or greater on all streams subjected to grazing where bank alteration was measured by Christie in the HKA, LCA, SCA, and UMFA (Third Christie Declaration, pp. 9, 10, Table 1, ¶ 18). These data summarized in the Third Christie Declaration (pp. 9, 10, Table 1, ¶ 18) show that bank alteration in streams subjected to grazing in 2008 in these four allotments was consistently and significantly greater than 10% bank alteration standard for these allotments set under the NOAA Fisheries 2007-2011 Biological Opinion as described in the EOYR and displayed in the following figure:

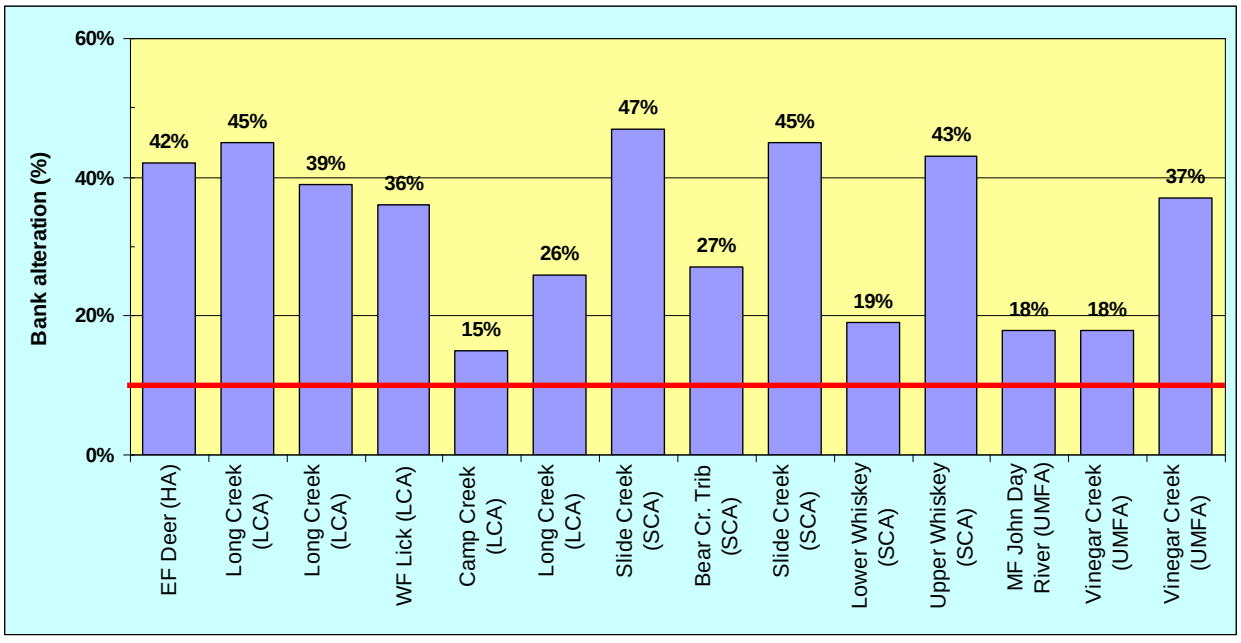

Figure 1. The bank alteration levels measured by Christie on 14 stream reaches in the HKA, LCA, SCA, and UMFA on the MNF in October 2008. The chart identifies the

stream and the allotment (abbreviated in parentheses) where bank alteration was measured by Christie. The horizontal red line in the chart highlights the 10% bank alteration standard for these allotments (EOYR). These results demonstrate that bank alteration on streams in all four of these allotments is well in excess of the bank alteration standard described in the EOYR for these allotments.

12. The bank alteration data in the MNF's EOYR show that bank alteration standards were also exceeded in FA and MVJDBA. As shown in Figure 2, below, bank alteration was greater than the 10% bank alteration standard in five of six areas where bank alteration was measured by the MNF in the MVJDBA. In the FA, the bank alteration standard of 20% was greatly exceeded in one of the two areas where the MNF measured bank alteration, as shown in Figure 2:

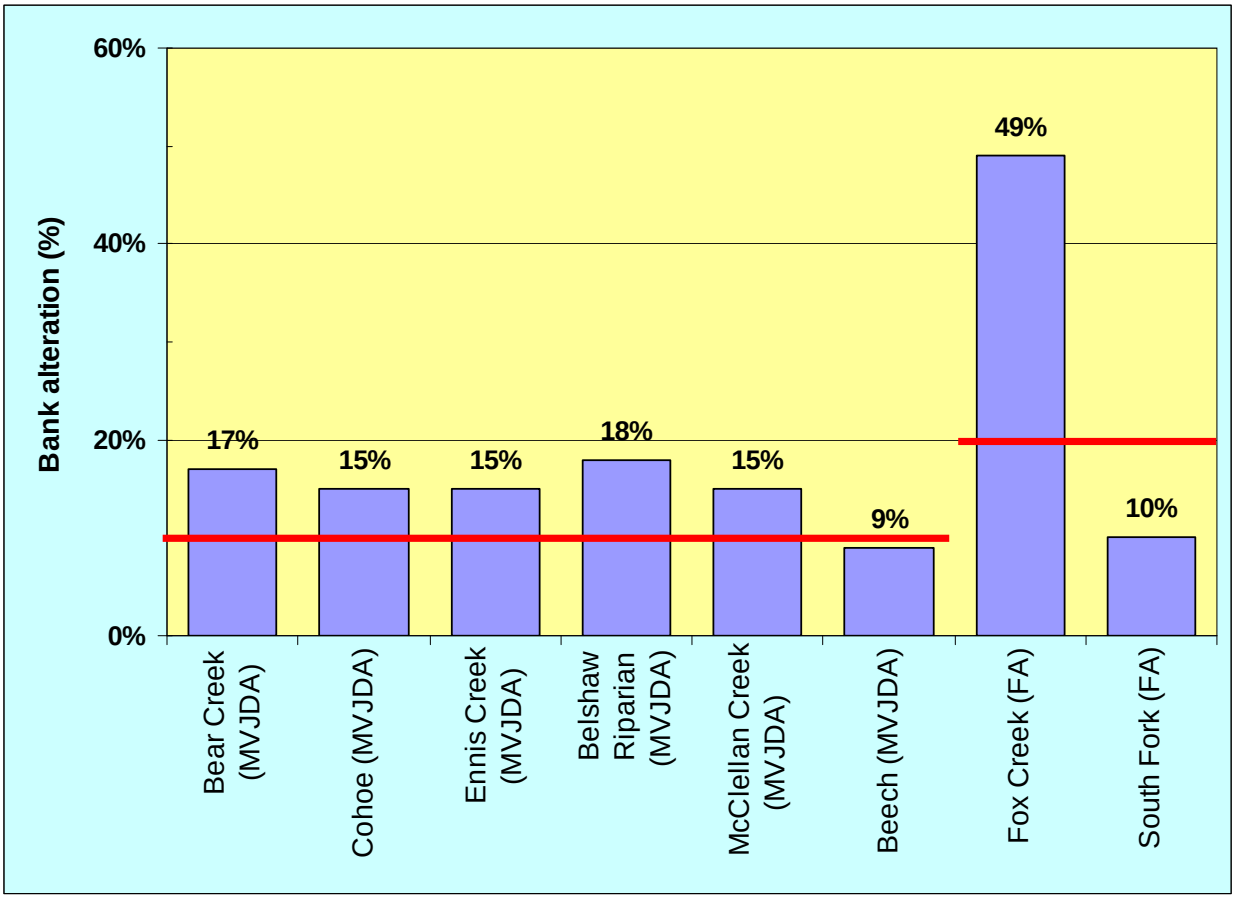

Figure 2. The bank alteration levels measured by the MNF as summarized in the EOYR in six areas in the MVJDBA and two areas on the FA in October and November 2008. The

chart identifies the allotment unit and the allotment (abbreviated in parentheses) where bank alteration was measured as described in the EOYR. The horizontal red line in the chart highlights the 10% bank alteration standard for the MVJDBA and the 20% bank alteration standard for the FA, as described in the EOYR. These results demonstrate that bank alteration in these allotments exceeded bank alteration standards for the allotments.

13. This level of bank alteration has several adverse impacts on stream channels and aquatic systems. 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). 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 demonstrate bank alteration contributes significantly to bank instability (Rhodes First Declaration, p. 8, ¶ 17).

14. Bank instability and stream damage caused by bank alteration is unsurprising due to existing conditions in the allotments. The banks of many streams in these allotments 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. 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.

15. 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. This inevitably leads to significant bank alteration when cattle have access to streams.

16. Grazing management in the allotments makes significant bank alteration to

streams inevitable because cattle are grazing these six allotments during the hot summer season (EOYR, pp. 68-71). Grazing impacts and cattle are concentrated in riparian areas during the summer, as many assessments have repeatedly documented, including those of the USFS (Platts, 1991), BLM (Leonard et al., 1997), and NOAA Fisheries (Murray et al., 2004). This increases the grazing damage to banks, streams and riparian areas. As NOAA Fisheries has 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).

17. Livestock grazing and attendant impacts, including bank alteration, contributes to bank instability and prevents or impedes the recovery of bank stability as indicated by bank stability and bank alteration data discussed in my First Declaration (pp. 8-12, ¶¶ 17-22). These data clearly show bank instability consistently decreases via natural recovery with rest from significant grazing and attendant bank alteration, while bank instability remains highly degraded in reaches that are subjected to continued grazing.

18. The levels of bank alteration in these six allotments documented in the Third Christie Declaration and the MNF's EOYR are significant because bank alteration contributes to the degradation of stream 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 these allotments (Columbia-Blue Mountain Resource Conservation & Development Area, 2005[1]).

19. 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 water temperature is already major problems for steelhead survival and production in streams affected by grazing in the six allotments (Columbia-Blue Mountain Resource Conservation & Development Area, 2005).

20. Bank alteration also reduces overhanging banks and prevents their recovery as corroborated by data from grazed areas on the MNF as discussed in my First Declaration (First

[1] Columbia-Blue Mountain Resource Conservation & Development Area, 2005. John Day Subbasin Revised Draft Plan. Northwest Power and Conservation Council, Portland, OR. This plan provides a background to guide efforts to protect and restore anadromous fish, including steelhead. As part of this background, the plan identified factors limiting steelhead populations in various watersheds with the John Day Subbasin.

Declaration (pp. 13-14, ¶ 25) Overhanging banks are an essential aspect of steelhead habitat. Overhanging banks are non-existent to rare on streams subjected to livestock grazing on the MNF, as I have repeatedly observed and measured in my work on the MNF.

21. Therefore, the bank alteration in these six allotments 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…"

22. Arresting and reversing the damaged bank conditions in these six allotments will require at least several years of rest from grazing. 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; Spence et al., 1996).

23. 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, 1991; Spence et al., 1996; 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; Spence et al., 1996; 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 HKA, LCA, SCA, UMFA, FA, and MVJDBA of the meet at least one or more these criteria. Therefore, available scientific information, including that of the USFS clearly indicates that several years of rest from grazing is needed in these six allotment in order to allow the recovery of bank conditions.

24. As previously discussed, studies and available data have repeatedly found that complete rest from livestock grazing is the only grazing management option that is the most consistent with the avoidance of additional livestock damage to degraded streams (e.g., Platts,

1991; Spence et al., 1996). Available scientific information amply shows that many stream conditions, including bank instability, will begin to improve with complete rest from livestock grazing. This will contribute to decreasing negative impacts on steelhead survival and production caused by grazing, including those that affect overhanging banks, turbidity, sedimentation, pool quality, and water temperature.

25. In contrast, continued grazing contributes to the perpetuation of negative impacts on steelhead, including bank instability overhanging banks, turbidity, sedimentation, pool quality, and water temperature. This is especially likely with continued livestock grazing during the hot summer season and late fall. This is because cattle have a well-documented tendency to concentrate in riparian areas during the summer, which results in significant impacts to riparian areas, banks and streams, as described in work by the USFS (Platts et al., 1991), BLM (Leonard et al., 1997), and NOAA Fisheries (Murray et al., 2004).

Summary and Conclusions

26. The bank alteration data in the Third Christie Declaration meets professional standards and reliably demonstrates that bank alteration on streams in the HC, LCA, SCA, and UMFA in 2008 were consistently in excess of bank alteration standards for those allotments. The MNF's bank alteration data indicates that bank alteration standards were exceeded in the FA and MVJDBA. These results are predictable due to summer grazing by livestock coupled with the existing, damaged bank conditions in these allotments. 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. The bank alteration in these six allotments prevents or impedes the recovery of bank stability.

27. Available scientific information indicates that bank alteration negatively affects

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.

28. Available scientific information indicates that bank alteration negatively affects 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.

29. Available scientific information amply demonstrates that rest from livestock grazing allows natural recovery processes to begin to reduce damage caused by livestock grazing. This recovery in the absence of grazing contributes to reducing impacts that adversely affect steelhead survival and production. Continued livestock grazing contributes to maintaining or exacerbating negative impacts on steelhead habitats that reduce the survival and production of steelhead, including negative effects on erosion, sedimentation, channel form, banks, and water temperature. 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 9th day of April 2009

__s/ Jonathan J. Rhodes_____

Jonathan J. Rhodes

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