Staff Report for Riparian Resources
in response to
SUWA Petition filed on December 22, 2006

Prepared by Paul Curtis
July 23, 2010

1.0 Introduction

The Southern Utah Wilderness Alliance, and others, submitted a "Petition to Preserve Arch Canyon's Natural and Cultural Heritage". The Petition was submitted to the Bureau of Land Management (BLM) Monticello Field Office on December 22, 2006 and includes supporting information provided in 14 Exhibits. In the Petition, SUWA contends that motorized use in Arch Canyon is currently causing and will continue to cause adverse impacts to the rare and extensive riparian area. Therefore, the purpose of this report is to assess the effects of motorized vehicle use on the riparian resources within Arch Canyon.

Arch Canyon is located about 15 miles west of the City of Blanding and is a tributary to Comb Wash. A dirt road is located in the bottom of Arch Canyon and is approximately 8.6 miles long. About 3.5 miles up canyon from the cattle guard at the mouth of Arch Canyon, the road crosses onto land managed by the Utah School and Institutional Trust Lands Administration (SITLA); at 8.6 miles the road ends at a trailhead that provides access to lands administered by the Manti-La Sal National Forest.

2.0 Information Provided in the Petition

The riparian resource information provided in the Petition is found within the main text and the supporting information presented in Appendix E and Appendix F. Appendix E is titled "Arch Canyon Condition Assessment and Management Recommendations by Charles Schelz, ecologist (August 2006). Appendix F is an Addendum (December 2006) to the Schelz report included in Appendix E which addresses the flood impacts which occurred in Arch Canyon in October 2006. The Petition states that Mr. Schelz is a biologist, botanist, and ecologist with 19 years of experience in designing protocols and monitoring ecosystems in southeastern Utah and around the western United States.

According to the Schelz report, the riparian area in Arch Canyon was assessed as "Functioning at "Risk" with a downward trend. The primary cause for this assessment is the existing OHV route that traverses the floodplain and crosses the streambed approximately 60 times. Some of the other major points in the Schelz report are as follows:

- Many sections of the riparian areas of Arch Canyon that contain the 4-wheel drive route are at risk of becoming non-functional in their present state of increased erosion and scoring. These at-risk sections lack productive habitat for fish, amphibians, aquatic organisms, and wildlife. They no longer dampen flood peaks or assist in recharging

subsurface aquifers. There is evidence of a lowered water table in areas where once-productive wet meadows are now occupied by sagebrush, cheatgrass and other typical upland plants.

- Mr. Schelz reports that multiple negative effects of vehicle routes in riparian areas are related by a cascading sequence of cause and effect. The cascade begins when vehicle tires cross the stream bank – vegetation is crushed and eliminated, which allows more soil to erode and the velocity of high water flows to increase. The subsequent scouring effect uproots downstream vegetation and can decrease the naturally meandering nature of the stream channel. The adjacent floodplain is also affected as flood events are not spread out and slowed down by stream bank vegetation, resulting in a decrease in groundwater recharges: "The 4-wheel drive route then becomes a storm water discharge conduit, causing scouring, lateral cutting between the 4-wheel drive route and the original stream channel, straightening of the channel where the 4-wheel drive route cuts off a natural meander, increased water velocity, and reducing the amount of potential floodplain infiltration and recharge. With diminished sediment in the stream channel and less ground water recharge in the floodplain, in-stream flow is lowered during low flow periods – negatively affecting aquatic habitat. Ultimately, the final loser in this cascade of events is native biodiversity."

- Most of the adverse impacts predicted by Mr. Schelz's initial report were born out in Arch Canyon after the heavy rainstorms and flood events of October 2006. Mr. Schelz's assessment of the damage is that: "The heaviest damage was documented in areas where the floodwaters jumped from the channel, and instead of spreading out over the floodplain, as would occur in a properly functioning system, were quickly diverted by the presence of an unvegetated and entrenched 4-wheel drive route that crosses the channel 60 times in 8.5 miles. This interception of the floodwaters by the 4-wheel drive route contributed to a substantial increase in flow velocity and energy because the waters became constricted and concentrated within the artificial channel created by the 4-wheel drive route."

- Mr. Schelz's assessment of the flood impacts concludes that the existence of the ORV route in the canyon bottom "contributed to substantially more erosion than what would have occurred if the 4-wheel drive route didn't exist, and it greatly increased the destruction of vegetation and streambanks, in particular in areas where the 4-wheel drive route crosses the stream channel. There are many areas where the stream channel has widened due to streambank failure and vegetation loss during these floods. All of this has contributed to the further loss of riparian habitat, and in particular, fish habitat, upon which the flannelmouth sucker and bluehead sucker depend for survival."

3.0 BLM Review of Existing Information

The BLM has reviewed the following existing information regarding riparian resources within Arch Canyon in order to assess the effects of motorized vehicle use. This information is referenced as follows:

Aubry, A.M. 2003. Water quality sampling in Arch Creek. Bureau of Land Management, Moab, Utah.

Aubry, A.M. 2003. Arch Canyon inspection and monitoring report and photos, April Jeep Safari. Bureau of Land Management, Moab, Utah.

Aubry, A.M. 2007a. Arch Canyon stream channel cross section and survey and flood flow estimate. Bureau of Land Management, Moab, Utah.

Aubry, A.M. 2007b. Water quality monitoring in Arch Canyon related to permitted jeep and ATV use, 2007. Bureau of Land Management, Moab, Utah.

Aubry, A.M. 2009. Water quality sampling in Arch Creek-monitoring Jeep Jamboree. Bureau of Land Management, Moab, Utah.

Aubry, A.M. 2010a. Hydrologic conditions in Arch Canyon. Bureau of Land Management, Moab, Utah.

Aubry, A.M. 2010b. Water quality sampling in Arch Creek. Bureau of Land Management, Moab, Utah.

Curtis, P. and E. Hindley. 1995. Arch Canyon PFC assessment. Bureau of Land Management, Moab, Utah.

Curtis, P. and P. Leatherbury. 2006. Arch Canyon post-flood riparian survey, Bureau of Land Management, Monticello, Utah.

Hall, J. 1994. Arch Canyon PFC field assessment completed under contract. Bureau of Land Management, Monticello, Utah.

Schelz, C. 2006. Arch Canyon condition assessment and management recommendations *in* Petition to preserve Arch Canyon's natural and cultural heritage. Appendix E. Report for the Southern Utah Wilderness Alliance.

Schelz, C. 2006. Addendum to Arch Canyon condition assessment and management recommendations *in* Petition to preserve Arch Canyon's natural and cultural heritiage. Appendix F. Report for the Southern Utah Wilderness Alliance.

Stager, B. and P. Curtis. 2007. State Office review of the 2006 Schelz report. Bureau of Land Management, Monticello, Utah.

McDougall, T., P. Curtis, and J. Brown. 2007. Arch Canyon geology field report. Bureau of Land Management, Monticello, Utah.

Rosgen, D. 1996. Applied river morphology. Printed Media Companies: Minneapolis, Minnesota.

U.S. Department of Agriculture. 2008. Visual riparian assessment tool. Biological Technical Note 50, Natural Resource Conservation Service, New Mexico.

U.S. Department of Interior. 1993. Riparian area management: Process for Assessing Proper Functioning Condition. Technical Reference TR-1737-9. Bureau of Land Management, Denver, Colorado.

U.S. Department of Interior. 1998. Riparian area management: A user guide to assessing proper functioning condition and supporting science for lotic areas. Technical Reference, TR-1737-15. Bureau of Land Management, Denver, Colorado.

4.0 Additional Studies and Information

Beyond the existing information cited in section 3, the BLM sought additional studies and information to reevaluate the Properly Functioning Condition of the riparian resources within Arch Canyon and assessing the effects of motorized vehicle use.

Curtis, P. and J. Carling. 2007. Arch Canyon field inspection to determine the extent of riparian vegetation. Bureau of Land Management, Moab, Utah.

Prichard, D. 2007. Review of Mr. Schelz Arch Canyon condition assessment. Bureau of Land Management, Monticello, Utah.

Prichard, D., G. Cruz, and P. Curtis. 2007. Arch Canyon PFC assessment. Bureau of Land Management, Monticello, Utah.

Stager, B., P. Curtis., and J. Carling. 2007. Arch Canyon PFC assessment. Bureau of Land Management, Monticello, Utah.

5.0 BLM Assessment of the Information Provided in the Petition

Mr. Schelz completed a Properly Functioning Condition (PFC) assessment for the riparian area in Arch Canyon in August 2006. The conclusion of this assessment was that the riparian area in Arch Canyon is functioning at risk with a downward trend. In response to this report, the BLM completed PFC assessments for the riparian area in Arch Canyon in January 2007 (Stager et al.), and in May 2007 (Prichard et al.). Both of these assessments concluded that the riparian area in Arch Canyon was in PFC. Additionally, in March 2007, the BLM conducted a field inspection (Curtis and Carling) to determine the extent of riparian vegetation in Arch Canyon

For the PFC assessment in May 2007, the BLM included Don Prichard on the interdisciplinary team who served (recently retired) with the BLM National Science and Technology Center. Mr. Prichard was nationally recognized in the BLM as a technical expert on riparian area management. He has served as the lead on several work groups to develop technical guidance for assessing riparian conditions that include Technical Reference (TR) 1737-9, *Process for Assessing Proper Functioning Condition* (Prichard et al., 1993), TR 1737-11, *Process for Assessing Proper Functioning Condition for Lentic Riparian-Wetland Areas* (Prichard et al., 1994), and TR 1737-15, *A User Guide to Assessing Proper Functioning Condition and the Supporting Science for Lotic Areas* (Prichard et al., 1998). Mr. Prichard also provided a review of the Schelz report in January 2007 prior to contributing to the May 2007 PFC assessment.

The method Mr. Schelz utilized for his PFC assessment of the riparian area in Arch Canyon was based on the U.S. Department of Agriculture, National Resource Conservation Service's (NRCS's) Visual Riparian Assessment Method (USDA NRCS Biological Technical Note 50). The method the BLM utilized for the PFC assessment in Arch Canyon was based on TR 1737-15. According to Prichard (2007), this difference in methodologies could be part of the reason for the difference in PFC assessments.

In Prichard's review of the Schelz report, he disagrees with Schelz's contention that he utilized a quantitative assessment. The method Schelz used is a visual assessment with a scoring system which is not quantitative. In order for it to be quantitative, actual measurements would be necessary. There is no evidence in his report where Mr. Schelz used measurements. Schelz states that he walked the canyon looking at its aspects and scoring them (Prichard, 2007).

Mr. Schlez states in his report that he did the riparian assessment himself. According to Prichard (2007), the NRCS method requires a team of 3-5 appraisers who represent varied natural resources backgrounds to do an assessment. The BLM PFC assessment (Prichard et al., 2007) utilized an interdisciplinary team in accordance with TR 1737-15. Prichard (2007) found that this difference in approaches could be another reason for the discrepancy in the two PFC ratings.

Prichard (2007) points out in his review that the NRCS method is designed more for a small headwater stream located in the Rocky Mountains rather than a desert stream. He further states in this review that a return interval floodplain inundation of 1.5 to 2 years works well for mountain streams, but an interval of 3.5-5 years is necessary for a desert stream. The BLM May 2007 PFC assessment (Prichard et al.) determined that the Arch Canyon watershed is a typical desert slick rock watershed with an intermittent, interrupted stream that limits the potential for riparian wetland vegetation. Landform plays a very important role in stability.

Another difference between the PFC assessments done by Mr. Schelz and the BLM (Prichard et al., 2007) is that Mr. Schelz classified the stream primarily as a C channel type and the BLM classified the stream primarily as a B (B2 and B3) channel type. Channels of the C type can be significantly altered and rapidly destabilized when changes in bank stability, watershed condition or flow regime are combined to cause an exceedance of a channel stability threshold. B channel types are considered very stable channels due to dominate substrate (i.e. rock, cobble, and boulder). Sensitivity of these channels to disturbance is very low for the B2 and B3 channel types (Rosgen, 1996). As stated in Prichard et al. (2007), intermittent systems limit the amount and kinds of vegetation that can be produced. While vegetation is important for B channel types it is more important for C channel types.

In the BLM PFC assessment of Arch Canyon in May 2007 (Prichard et al.), the vegetation is described as follows: "Where the vegetation is present it is diverse and varied in multiple age classes. Those riparian species present were obligate or facultative wetland plants. Plants exhibited good vigor, had good leader length growth on shrubs and herbaceous species were in flower. Those plants present are cottonwood, yellow willow, coyote willow, rushes, sedges and stream bank wildrye and numerous forbs. Willows, rushes, and sedges have tremendous root systems to hold banks together during major flow events like the event in October of 2006". Additionally, the assessment states that no significant impact to riparian functionality from the road crossings was detected.

On October 6-7, 2006 the National Weather Service recorded 3.2 inches of precipitation at their Blanding Station located about 15 miles east of Arch Canyon. The rain fell over a 24 hour period and is considered a 100-year event. This would indicate that the flood in Arch Canyon was a 100-year event. Peak flows during the flood event are estimated to be 3,000 cubic feet per second (Aubry, 2007). Sixty, eighty, and 100 year events occur infrequently and have such power that riparian-wetland areas in excellent condition can unravel, at least in places (TR 1737-15). However, this does not seem to be the case in Arch Canyon. As stated in the BLM May 2007 PFC assessment (Prichard et al.), this high flow event is a good indicator that the system is stable and functioning properly as indicated by pre and post-flood riparian vegetation. The assessment also found that the upland terraces or benches within Arch Canyon showed high vegetation species diversity and vigor. In addition, most of the terraces were above the main flow of water and showed little to no sign of erosion. These findings in the 2007 PFC assessment do not agree with Schelz's assessment of the flood impacts.

Mr. Schelz states that OHV route in Arch Canyon crosses the stream 60 times in approximately 8.5 miles and this is the primary reason for his assessment of Functioning at Risk. In the BLM March 2007 field inspection (Curtis and Carling), it was determined that about 33% of the stream channel in Arch Canyon contains riparian vegetation. Additionally, out of the 60 times the road crosses the stream channel; twenty-four (40%) of those crossings are in riparian vegetation; 10 (17%) of those crossings are in areas where riparian vegetation partially covers one side or the other of a stream bank; and 26 (43%) of those crossings are in areas where riparian vegetation is naturally not present because the landform does not provide for the hydrologic conditions to support riparian vegetation. According to the BLM May 2007 PFC assessment (Prichard et al.), it was found that even though the road crosses the stream 60 times, there were little to no impacts to the riparian areas because most of the road length is on the higher terraces and most of the crossings are at a right angle to the channel. This is also supported by Aubry's 2003 report on water quality monitoring at Arch Canyon during the ATV Safari. Additional monitoring reports by Aubry in 2007, 2009, and 2010 also conclude that motorized use along the road in Arch Canyon is not causing adverse effects to water quality.

6.0 Conclusions and Recommendations

The BLM May 2007 PFC assessment (Prichard et al.) concludes with:

> The difference between the BLM PFC assessment and the assessment done by Charles Schelz varies relative to how the channel was typed (i.e., B channel versus C channel); the method used to assess condition; the role landform plays in B channel types versus C channel types; and understanding intermittent and interrupted systems relative to the capability and potential to produce riparian wetland vegetation.

Therefore, based on the BLM's review of all the existing information on the riparian resources in Arch Canyon and reevaluating the PFC assessment, it is concluded that motorized vehicle use along the designated route within Arch Canyon is not causing and is not expected to cause adverse effects to the riparian resources.

7.0 Date and Sign

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8/24/2010
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