BEFORE THE COLORADO WATER CONSERVATION BOARD

STATE OF COLORADO

Rebuttal Statement of the Colorado Department of Natural Resources, Colorado Parks and Wildlife and the U.S. Department of the Interior, Bureau of Land Management

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IN THE MATTER OF AN INSTREAM FLOW APPROPRIATION ON THE DOLORES RIVER, in WATER DIVISION 4

Pursuant to Rule 5n(2) of the Rules Concerning the Colorado Instream Flow and Natural Lake Level, 2 CCR 408-2 ("ISF Rules"), Colorado Department of Natural Resources, Colorado Parks and Wildlife ("CPW"), and the U.S. Department of the Interior, Bureau of Land Management ("BLM") hereby submit their rebuttal statement in support of the Colorado Water Conservation Board ("CWCB") Staff's recommendation for an instream flow ("ISF") appropriation on the Dolores River between the confluence with the San Miguel River and the confluence with West Creek in the amounts set forth in CWCB staff recommendation - see CWCB staff recommendation at: http://cwcbweblink.state.co.us/WebLink/ElectronicFile.aspx?docid=174123&searchid=ea100ba0-da72-4c95-860e-b847ae02e33f&dbid=0.

A. REBUTTAL TO OPPONENT'S FACTUAL CLAIMS

1. **Opponents wrongly claim that the proposed appropriation seeks more than the amount necessary to "preserve the natural environment to a reasonable degree." Arguments 1A through 1F rebut this claim.**

1A. The proposed flow rates are the minimum amounts necessary to preserve the natural environment to a reasonable degree. When identifying minimum flow rates, it is necessary to consider multiple biologic and hydrologic factors. Minimum flow rates do not equate to the lowest flow periods in which the natural environment has persisted.

The CWCB's legal authority directs it to make ISF appropriations to "preserve the natural environment to reasonable degree." When developing an ISF recommendation, CPW and BLM assume that "preserve the natural environment" means that the current species associated with the stream should continue to exist, with a population size and age structure, species composition, and species distribution that are reasonably similar to when the ISF appropriation is made. It is inappropriate to recommend minimum flow rates that will allow aquatic species to merely survive, but with significantly reduced population numbers, distribution and health, because such flow rates do not preserve the natural environment to a reasonable degree. An aquatic environment that is consistently constrained by flows that are low, relative to the size of the stream channel, has a significantly reduced ability to rebound from stress events. These stress events include drought, high stream temperatures, disease, and competition from non-native species. If the aquatic community does not have an opportunity to recover from stress events, it imperils the ability of the aquatic community to be "preserved." Further, the proposed

flow rates are consistent with the Colorado Water Plan, which calls for projects and methods that promote "environmental resiliency."[1]

CPW and BLM note that portions of the Dolores River located upstream from the proposed ISF reach (above the confluence with the San Miguel River) are consistently stressed by low flows and a significantly modified hydrologic and thermal regime. The ability of the native fish community to "persist" in the upstream reach is being seriously challenged by that highly modified flow regime. Stakeholders who manage the Dolores River above the confluence with the San Miguel River are being forced to consider investment of significant resources just to keep the native fish community viable. In contrast, the minimum flow rates recommended by BLM and CPW for the proposed ISF water right are designed to perpetuate the aquatic community, preventing the need for significant human intervention in species management. To identify the minimum flow rates that can accomplish the objective of preserving the natural environment to a reasonable degree for the Dolores River, CPW and BLM evaluated multiple factors. The factors included life stages of native fish species, habitat needs of native fish species, the composition of the native fish community, the naturally variable hydrology of the Dolores River, and water availability as affected by human use of the river. Once all of these elements of the natural environment were documented and considered, the BLM and CPW conducted hydraulic modeling and habitat modeling to identify appropriate minimum flow rates. Only when all of these factors are carefully considered can the Board be confident that a proposed flow rate will preserve the natural environment, and that the environment will be preserved with the water that is available for appropriation.

Simply reviewing low flow episodes in which the native fish community has "persisted," as the opponents suggest, ignores the fact that critical life functions in a native fish community are completed during higher flow periods. Life functions that are successfully completed during higher flow periods are precisely what allow the fish community to "persist" through the low flow periods.

The following components of this rebuttal statement set forth the CPW and BLM analysis of all the factors listed above and how these factors were considered in recommending ISFs for the Dolores River.

1B. The life stages of native fish species found in the Dolores River require the flow rates recommended by the BLM and CPW. For these species to persist in the Dolores River and to preserve this environment to a reasonable degree, the recommended flow rates and timing are the minimum necessary. Studies of native fish species have concluded that peak flows, which coincide with the spawning period for native species, are needed to ensure reproductive success.

The BLM and CPW rebuttal statement will reference multiple studies that address the habitat needs and flow needs of warm water native fish species found in the Dolores River. Although

[1] Colorado Water Plan, Second Draft, Chapter 6, Page 242: "Projects and methods that maintain or improve Colorado's environmental and recreational values and achieve long-term sustainability and environmental resiliency are an important part of Colorado's water future. Resilience of a stream or watershed can be measured as an ecosystem's ability to recover function after a disturbance, where acute or chronic."

there are many studies that have investigated the biology and flow needs of flannelmouth sucker, bluehead sucker, and roundtail chub, BLM and CPW consulted only those studies that are specific to western Colorado. These studies will be referenced herein as indicated below:

- The San Juan River Recovery Implementation Program ("SJRIP") was established to recover the Colorado pikeminnow and the razorback sucker while allowing water development and management activities to continue in the San Juan River basin. The SJRIP Report "Flow Recommendations for the San Juan River" provides information relating to the life stages and stream flow requirements of the native fish community, including the bluehead and flannelmouth sucker, roundtail chub and speckled dace. The entire report can be found on the SJRIP website located at: http://www.fws.gov/southwest/sjrip/index.cfm.

  The native fish ISF recommendations for the San Juan River were the result of a seven-year study that was designed and performed by the Biology Committee of the SJRIP. The Biology Committee of the SJRIP consisted of individuals representing a wide range of organizations and interests including the Bureau of Indian Affairs, US Fish and Wildlife Service (USFWS - Regions 2 and 6), Bureau of Reclamation, Jicarilla-Apache Tribe, Navajo Nation, Southern Ute Tribe, States of Colorado and New Mexico, and water users. The SJRIP study was also peer reviewed by Drs. David Galat (University of Missouri), Ellen Wohl (Colorado State University), Clark Hubbs (University of Texas) and Ron Ryel (Independent Consultant). (see page P-1 SJRIP Executive Summary).

  This document will be referred to herein as "SJRIP Report."

- Rick Anderson and Greg Stewart, two retired CPW research biologists, published multiple reports concerning the relationship between river flow rates and fish habitat/biomass on rivers in western Colorado. These reports include:

  Using 2D Modeling to Determine the Relationship Between Flow and Habitat Availability for Warm-Water Riverine Fish in Colorado. 2003 Annual Progress Report to Colorado Division of Wildlife, F-289. Ft. Collins, CO. (http://cwcbweblink.state.co.us/weblink/0/doc/196281/Electronic.aspx?searchid=6945bcbd-7a14-4a27-80c0-625f3984f768)

  Quantification of Habitat Availability and Instream Flows on the Gunnison River and Impacts of Long-term Drought on Native Fish Populations in the Dolores River. 2006 Annual Progress Report to Colorado Division of Wildlife. Ft. Collins, CO. (http://cwcbweblink.state.co.us/weblink/0/doc/196280/Electronic.aspx?searchid=6945bcbd-7a14-4a27-80c0-625f3984f768)

  Two-dimensional Fish Modeling for Predicting Fish Biomass in Western Colorado. 2007 CDOW Special Report Number 80. Ft. Collins, CO. (http://cwcbweblink.state.co.us/weblink/0/doc/196282/Electronic.aspx?searchid=6945bcbd-7a14-4a27-80c0-625f3984f768)

Impacts of Streamflow Alterations on the Native Fish Assemblage and Their Habitat Availability as Determined by 2D Modeling and the Use of Fish Population Data to Support Instream Flow Recommendations for Sections of the Yampa, Colorado, Gunnison, and Dolores Rivers in Colorado. 2007 CDOW Special Report Number 80. Ft. Collins, CO (http://cwcbweblink.state.co.us/weblink/0/doc/196283/Electronic.aspx?searchid=6945bcbd-7a14-4a27-80c0-625f3984f768)

These studies will be referred to herein as the Stewart and Anderson Reports.

- Miller Ecological Consultants has produced numerous studies relating to the habitat requirements and flow needs of warm-water native fish species in western Colorado. These reports include:

  Instream Flow Report for the Colorado River from Kremmling, Colorado Downstream to Dotsero, Colorado, 2011. (http://cwcbweblink.state.co.us/weblink/0/doc/196287/Electronic.aspx?searchid=a3a86400-b00c-49f4-ac3f-657f2ee61d1c)

  Roundtail Chub Technical Conservation Assessment, USDA Forest Service, Rocky Mountain Region Species Conservation Project, 2005. (http://cwcbweblink.state.co.us/weblink/0/doc/196286/Electronic.aspx?searchid=4c52800b-4a1f-4f25-bc80-2badf72a3218)

  Bluehead Sucker Technical Conservation Assessment, USDA Forest Service, Rocky Mountain Region Species Conservation Project, 2005. (http://cwcbweblink.state.co.us/weblink/0/doc/196284/Electronic.aspx?searchid=4c52800b-4a1f-4f25-bc80-2badf72a3218)

  Flannelmouth Sucker Technical Conservation Assessment, USDA Forest Service, Rocky Mountain Region Species Conservation Project, 2005. (http://cwcbweblink.state.co.us/weblink/0/doc/196285/Electronic.aspx?searchid=4c52800b-4a1f-4f25-bc80-2badf72a3218)

  These reports will be referred to herein as the "Miller Reports."

All of the studies referenced above discuss the role of peak flows in the conservation and protection of warm water native fish species in large western Colorado rivers. The SJRIP Report did not develop specific habitat suitability curves for any life stages of the roundtail chub, speckled dace, bluehead sucker or flannelmouth sucker, but it did provide specific observations regarding what flows provided these species with better reproductive success. The results of this seven-year study indicated that:

> "*the young of bluehead sucker and speckled dace, ..., were found in greater numbers during* ***high flow years*** *(emphasis added) compared with low flow years*" (see 3rd

paragraph, page S-3, SJRIP Executive Summary) and bluehead sucker and speckled dace reproductive success increased with increasing duration of flows equal to or exceeding bankfull conditions (see last paragraph, page S-6, SJRIP Executive Summary).

Bankfull discharge in the San Juan River was estimated to be approximately 8,000 cfs, indicating that reproductive success is enhanced in this river by flow rates that would be considered very large for rivers in western Colorado.

Bankfull flows also fulfill other critical habitat functions, as Dr. Miller pointed out in the Miller Report report regarding the Colorado River:

> *"Peak flows are most important for habitat creation and maintenance. Peak flows of bankfull and higher are required at regular frequency for proper ecosystem function."* (see 1st paragraph page iv) (Miller & Swaim 2011).

In addition to consulting studies regarding native fish habitat and flow needs, BLM and CPW also consulted with experts (personal communications with CPW aquatic biologists Dan Kowalski, Jim White, Sherman Hebein, John Alves, and Rick Anderson (retired)) on the biology of these species. Those consultations revealed that one of the most important processes for preserving a thriving community of native species is the presence of a large adult population. The native species found in the Dolores River are long-lived species, so a large adult population can persist and then spawn throughout the river channel when conditions are optimal for spawning and recruitment. It is important to note that these hydrologic conditions suitable for spawning do not occur every year in the rivers that were investigated. If a thriving adult community with a variety of age classes is present, it indicates suitable flow rates for spawning are occurring. In addition, a thriving adult community with a variety of ages indicates that fry and juveniles are successfully recruited into the adult community and are finding suitable habitat in a variety of flow rates over a period spanning several hydrologic years.

The Stewart and Anderson Reports and the Miller Reports also clearly indicate that the native species spawn on both the ascending and descending limbs of the hydrograph, at flows equal to or greater than the recommended instream flows. Figure 1 below displays the mean and median year hydrographs based upon data from the Colorado Decision Support System STATEMOD model for the Dolores River. Figure 1 also shows that flows begin increasing sharply in early April and typically peak on or about May 11 (corresponding to the flannelmouth sucker spawning season) and that flows gradually decrease from the median peak flow on or about May 11 through July (corresponding to the roundtail chub and bluehead sucker spawning seasons).

Figure 1: Average and Median Monthly Flow

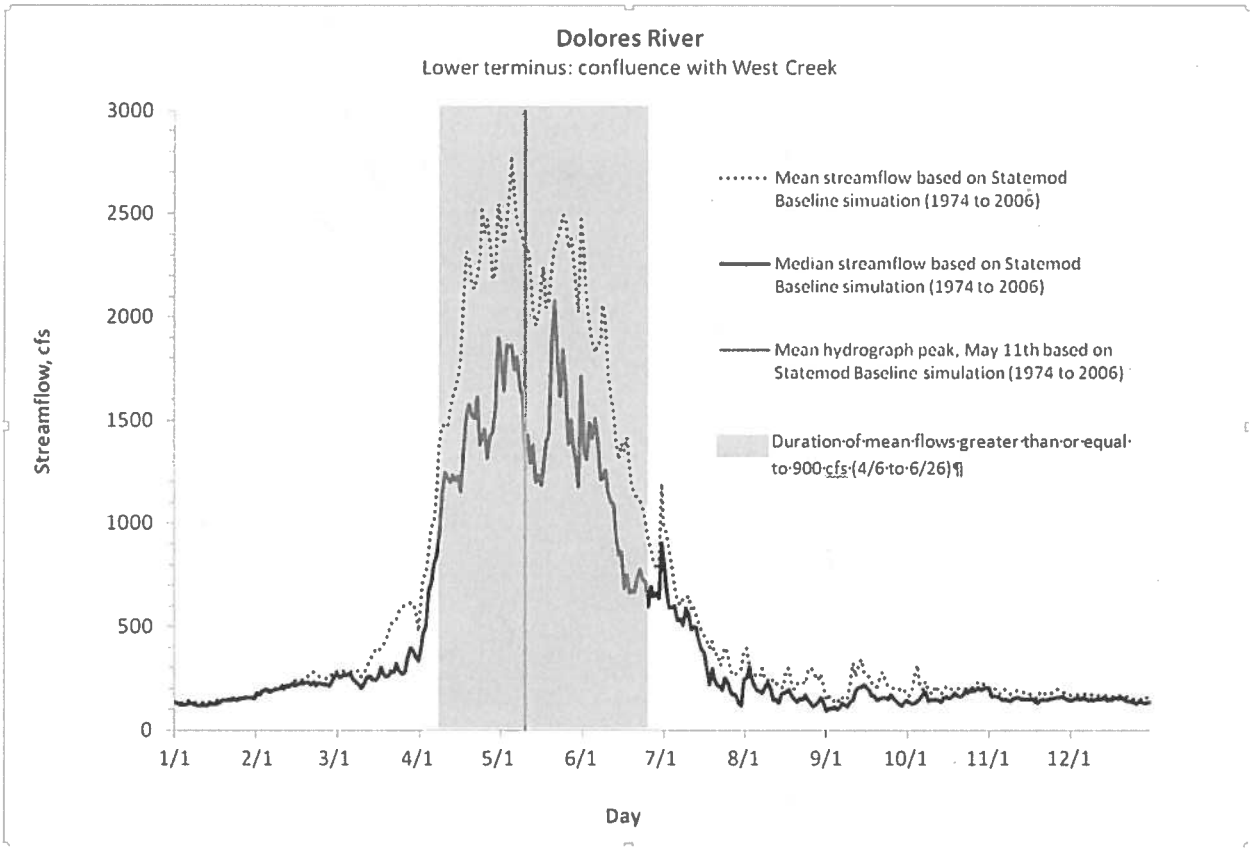

Table 1: Expected Dolores River Flows at Gateway.

Simulated Flows in CFS		
	Mean	Median
April 1	477	335
April 15	1648	1209
May 1	2551	1899
May 15	1958	1199
June 1	2491	1717
June 15	1311	850
July 1	1193	908
July 15	519	435

Table 1 (above) indicates the mean and median year flow amounts that could be expected in the Dolores River at the time these species spawn. The mean year hydrograph indicates that flows exceed 900 cfs for an 81-day-spawning time period surrounding the median date of peak flows, which occurs on or about May 11 each year.

Flannelmouth suckers spawn during the ascending limb of the hydrograph, while roundtail chubs and bluehead suckers both spawn on the descending limb of the hydrograph. The proposed ISF recommendation took these life stages into consideration by providing flows that resemble a natural snowmelt runoff hydrograph. The recommendation provides for an early spring increase in flow rate at 200 cfs (March 16 to April 14), provides for the minimum necessary protection of the peak of the hydrograph, 900 cfs, (April 15 – June 14), and then slowly steps down with the declining limb of the hydrograph, 400 cfs (June 15 – July 15) and 200 cfs (July 16 – August 14).

If BLM and CPW had followed the procedures suggested in the SJRIP Report, and conducted modeling to identify flows rates that optimize habitat for spawning and fry life stages of the native fish community (not just modeling of adult fish habitat needs), the resulting flow recommendations would have been much higher. Specifically, the SJRIP Report recommends protecting bankfull flows to support these life stages. If these procedures were followed in the Dolores River, the magnitude of the BLM and CPW recommendations would be much higher than the proposed peak flow rate of 900 cfs.

To illustrate the ramifications of utilizing the methods suggested in the SJRIP report, BLM and CPW consulted two data sources to estimate bankfull flow rates at the lower terminus of the proposed instream flow reach. First, BLM and CPW consulted the long-term gage records for the Dolores River gage at Cisco, UT.[2] There are very few tributaries that provide additional significant flow to the Dolores River between Gateway and the Cisco gage location, and none of

[2] http://www.cbrfc.noaa.gov/gmap/info/info.php?type=rivercrit&idcol=lid&station=DOLU1

those tributaries contribute more than five percent to Dolores River discharge during base flow conditions; it is therefore indicative of hydrologic conditions in the ISF reach. The National Oceanic and Atmospheric Administration ("NOAA") reports that bankfull flow at Cisco is 9,023 cfs. BLM and CPW also consulted the historic records for the USGS streamflow gage that was operated at Gateway from 1937 to 1954 (pre-Dolores Project)[3]. This gage data indicates that the river had a mean peak flow of 4,390 cfs on May 6, and that peak flows of 10,000 to 13,000 cfs occurred on a 1 to 3 year recurrence interval. Although the USGS did not calculate bankfull flows for the Gateway gage, it is clear that bankfull flows exceeded 4,390 cfs, because by definition, bankfull flows exceed the annual mean peak flow. Based upon this information, BLM and CPW conclude that a bankfull flow for the Dolores River in the ISF reach is between 4,390 cfs and 9,023 cfs. Obviously, these flows are substantially more than the 900 cfs peak flow rate recommended by BLM and CPW.

Despite the importance of bankfull flows as indicated by multiple studies, CPW and BLM chose not to incorporate a bankfull flow recommendation because CWCB procedures require a flow to be available at least 50% of the time before that water can be appropriated. Bankfull flows occur on the Dolores River at infrequent intervals, making it difficult to meet the "50% of the time" criteria for appropriation. However, BLM and CPW analysis revealed that a peak flow of 900 cfs would provide substantial habitat for the native fish community, even though it is considerably less than the bankfull flow. Furthermore, 900 cfs is available at least 50% of the time and thus is consistent with CWCB procedures. Unless large new storage projects are implemented upstream from the proposed instream flow water right, it is likely that bankfull flows will continue to occur on an occasional basis. CPW and BLM reach this conclusion because relatively natural peak flow hydrology still exists on the San Miguel River and because above average snowpack years can still result in spills from the Dolores Project.

Based upon the review of the Stewart and Anderson Reports, the Miller Reports, and consultation with CPW experts on native fish, BLM and CPW assert that protecting peak flows is essential for the persistence of the native fish community. CPW and BLM assert that protecting a very high percentage of available habitat, but only during the two months of year when peak flows occur, is a critical component of the minimum amount necessary to preserve the natural environment to a reasonable degree. CPW and BLM reach this conclusion because protecting a high percentage of available habitat during these two months is necessary to maintain spawning cycles of the native fish species and is necessary for maintaining the adult fish component of the population. During the other 10 months of the year, the proposed flow rates provide significantly lower percentages of available habitat for adult fish, but also emulate the typical hydrologic conditions that exist in this reach of the Dolores River.

1C. The diverse habitat needs of native fish species in the Dolores River support the conclusion that the recommended flow rates, at the times claimed, are the minimum necessary to preserve the natural environment to a reasonable degree. The diverse habitat needs of the native fishes are reflected in the life stage curves that CPW and BLM used in the PHABSIM modeling. The resulting flow rates, which vary over different times of the

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[3]http://waterdata.usgs.gov/nwis/dvstat/?referred_module=sw&site_no=09179500&por_09179500_2=345786,00060,2,1936-10-01,1954-09-30&format=html_table&stat_cds=mean_va&date_format=YYYY-MM-DD&rdb_compression=file&submitted_form=parameter_selection_list.

year, provide the variety of habitats needed by native fish species during different life stages.

BLM and CPW reviewed the Stewart and Anderson Reports and the Miller Reports to identify the habitat types needed by the native fish species in the Dolores River and to identify what specific life stage habitat suitability curves have been developed for these species. In addition, BLM and CPW compared these two sets of studies to determine if there were any river-related and site-specific factors identified in those studies that would indicate that existing curves should be modified if applied to different rivers.

The Anderson and Stewart Reports focused on specific habitat types found in medium- to large-sized rivers with existing native fish populations. The Dolores River is clearly a medium- to large-size river, and it is morphologically similar to rivers studied by Anderson and Stewart. Anderson and Stewart have identified 16 different "mesohabitats", or basic structural elements of a stream, such as pools, runs, riffles, and glides. Anderson and Stewart further defined these basic structural elements by the average water velocity and depth typically found in these habitat types. BLM and CPW concluded that the reach selected for PHABSIM analysis on the Dolores River contains the same set of habitat types, which make findings of the Anderson and Stewart Reports applicable to the Dolores River.

BLM and CPW also compared the relative composition of the native fish communities at the Anderson and Stewart study sites with the composition of the native fish community on the Dolores River. BLM and CPW conducted this comparison because habitat competition among species can cause differences in habitat preferences. Based upon this comparison, BLM and CPW determined that the native fish community on the Dolores River was not substantially different from the fish communities on rivers used to develop the habitat curves. In the sites used to develop the habitat curves, flannelmouth sucker are typically the most common native species, with bluehead sucker as the second most abundant and roundtail chub comprising a smaller portion of the native fish community. The Dolores River below the confluence with the San Miguel River is generally consistent with this composition of native species.

The CPW and BLM review of the Miller Reports and SJRIP Report indicated that native fish require a diversity of habitat types that are provided when flows resemble a natural hydrograph during spring and summer. In regard to the habitat and flow needs of the native fish found in the San Juan River, the SJRIP Report states:

> "*Habitat needs of the two endangered fishes in the San Juan River involve a complex mix of low velocity habitats such as eddies, pools, and backwaters adjacent to swifter run and riffle habitats. Habitat use changes with time of year and activity (e.g., spawning, feeding, nursery areas). A natural hydrograph, in terms of peak spring flows and late summer base flows, is important to not only provide the proper habitats at the correct time, but also to provide natural temperatures and productivity cycles for those habitats.*"(See SJRIP Paragraph 3, Page S-2)

BLM and CPW assert that these same habitat preferences apply to the non-endangered native fish community found in the Dolores River. For this reason, CPW and BLM choose to model a variety of habitat types as part of the PHABSIM modeling effort. CPW and BLM used the

PHABSIM modeling results to recommend peak flows during snowmelt runoff that provide critical spawning habitat. The lower flows recommended for the remainder of the year also provide a variety of critical habitat types, including pools, runs, glides and riffles.. It is important to note that the flow rates recommended for 10 months of the year, from July 16 through April 14, protect much lower percentages of available habitat (in contrast to the percentages protected during the two months of peak flows), ranging from 9.5 % to 64.8% of weighted usable area for bluehead suckers, as calculated during the PHABSIM modeling effort (see Table 2).

1D. The composition of the native fish community in the Dolores River supports the conclusion that the recommended flow rates and timing are the minimum necessary to preserve the natural environment to a reasonable degree. A naturally variable hydrograph is necessary to preserve this native fish community.

As stated in the CPW and BLM recommendation letters to the CWCB, the native fish species comprise 76% to 89% of the fish sampled in this reach of the Dolores River. In addition, physical characteristics of the flannelmouth sucker and bluehead sucker sampled from this stream reach indicate that there is no genetic hybridization with white suckers, which has occurred in other rivers in western Colorado. As such, this reach of the Dolores River supports a genetically intact and fully functional assemblage of native fishes. It is important to note that this is relatively rare in Colorado. As stated above, preserving a native fish assemblage and its habitat requires preserving natural variability in flow rates.

In attempting to preserve the native fish community of the San Juan River, the Biology Committee of the SJRIP wrote that:

> *"Mimicry of the natural hydrograph is the foundation of the flow recommendation process for the San Juan River. Scientists have recently recognized that temporal (intra- and interannual) flow variability is necessary to create and maintain habitat and to maintain a healthy biological community in the long term. Restoring a more-natural hydrograph by mimicking the variability in flow that existed before human intervention provides the best conditions to protect natural biological variability and health. The linkages between hydrology, geomorphology, habitat, and biology were used to define mimicry in terms of flow magnitude, duration, and frequency for the runoff and baseflow periods." (see Page S-1 SJRIP Report Executive Summary).*

BLM and CPW agree with the concept stated above. The proposed ISF reach has healthy adult populations of native fishes and very few introduced non-native fishes because the relatively natural hydrograph. The relatively unaltered inflows provided from the San Miguel River favor native species over introduced species. Even though there is no physical barrier between the proposed ISF reach and the portion of the Dolores River located upstream from the confluence with the San Miguel River, the non-native fish species found upstream of the confluence with the San Miguel River have not substantially invaded the proposed ISF reach. The primary difference between these two reaches is flow-related, because the reach above the San Miguel River possesses a flow regime that has been highly modified by the operation of the Dolores

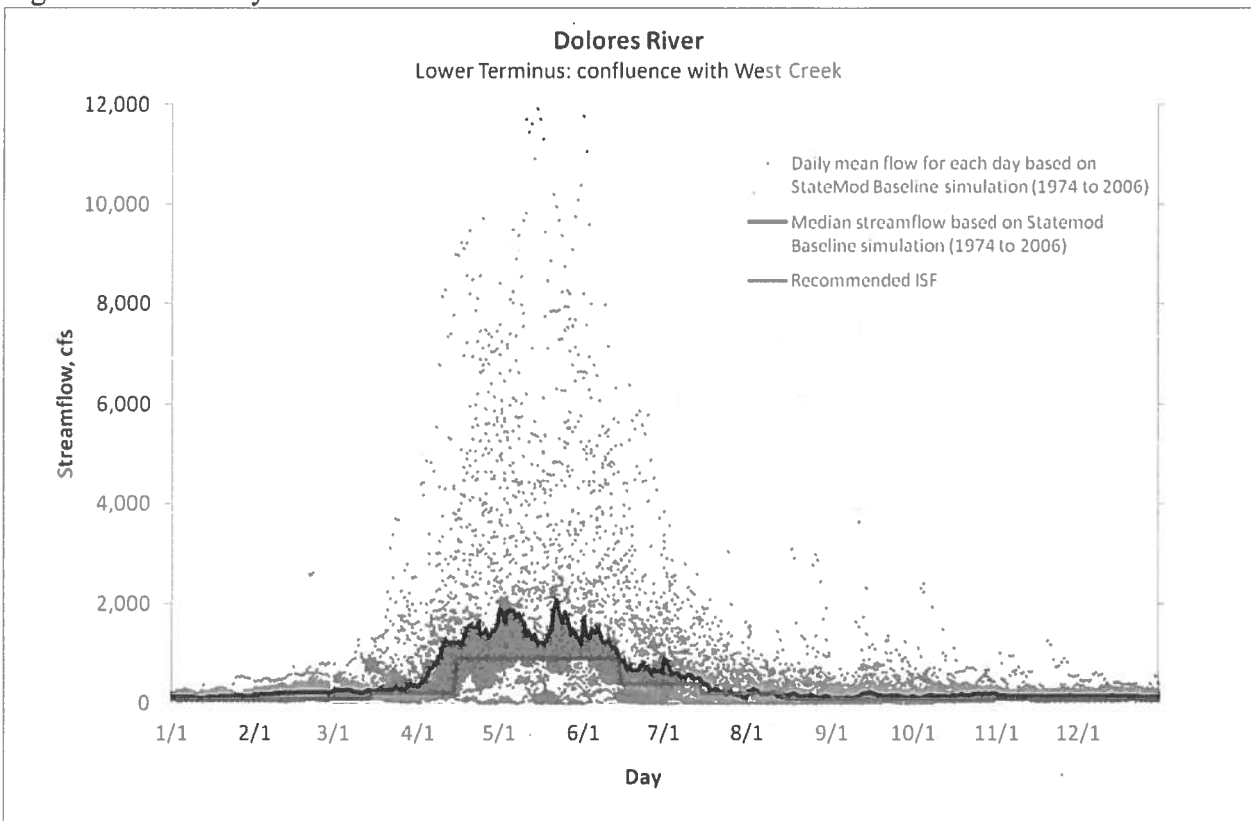
Project, whereas the proposed ISF reach still exhibits a substantially unaltered snowmelt-driven hydrograph.

The Dolores River below McPhee Reservoir is a specific example of how insufficient volume and variability of flows can be a factor contributing to declining fish populations. The natural environment and the existing fish community below McPhee Reservoir are severely affected by the lack of high flows associated with a natural hydrograph. Anderson and Stewart observed that:

> *"The fish community of the Dolores River appeared to be highly stressed. Species composition of native fish was high, but most fish were small. Roundtail chub was the most common species and biomass was very low. These attributes appeared to be habitat and flow related. The lack of runoff flows in 2000 and 2001 may have negatively impacted productivity. Riffles and runs had large silt deposits and both forage and habitat potential seemed unnaturally low. If the Colorado River data can be used as an example of a high-quality habitat and fishery, the Dolores River data can be useful as an example of very poor quality habitat conditions."*(Anderson and Stewart 2003).

When developing the proposed ISF flow rates, CPW and BLM considered the hydrologic variability that continues to exist in this reach, even though major storage projects are located upstream. Figure 2 (below) shows the range of flows that, over time, have created and maintained the geomorphology and natural environment in the proposed ISF reach.

Figure 2: Variability of Flow on the Dolores River



Each gray dot on Figure 2 represents a median daily flow, produced from the Colorado Decision Support System, using STATEMOD. Figure 2 demonstrates the existence of considerable variation in flows, especially during the snowmelt runoff period from late March through July. This variation in flows produces different habitat types in the stream channel, because different water depths and velocities produce different habitat types. In turn, these different habitat types that occur over the various years give the respective native species the conditions they need to reproduce and recruit fish into the adult population. BLM and CPW assert that their ISF recommendations preserve some of the variability found within the existing hydrologic record that is essential to the native fish species and their habitat.

1E. The PHABSIM and R2CROSS modeling results support the conclusion that the recommended flow rates and timing are the minimum necessary to preserve the natural environment to a reasonable degree.

Opponents of this recommendation assert that the proposed ISF rates are based upon "maximizing habitat for the identified species" and that doing so is greater than "only the minimum amount of water necessary to reasonably preserve the environment." (See Southwestern Prehearing Statement, page 9.) The Opponent's conclusion is erroneous for several reasons, set forth below.

- The Opponent's argument assumes that one flow rate is optimal for all fish species and all life stages; this is an inaccurate assumption. In reality, habitat for different fish

species and different life stages of those species is maximized at different flow rates. When developing the ISF recommendation, CPW and BLM selected two species, flannelmouth sucker and bluehead sucker, and one life stage, adult fish, for analyzing weighted usable area at various flow rates. CPW and BLM chose these two species because the scientific studies have indicated that the health of these two species can serve as indicators of the entire native fish community. By definition, the recommended flow rates will not maximize habitat for other species and for other life stages of the native fish because the recommended flow amounts target the needs of adult fish of the two identified species.

- The Opponents claim that the recommendations "maximize habitat" also overlooks the fact that the recommended flow rates were developed by utilizing two different methodologies. CPW and BLM utilized PHABSIM modeling to identify recommended flow rates only for the March 15 to August 14 period, a total of only 153 days annually. CPW and BLM utilized R2CROSS modeling to identify recommended flow rates for the August 15 to March 14 period which represents the remaining 212 days of any given year.

  During the August 15 to March 14 period, the recommended flow rate is clearly the minimum needed to preserve the natural environment during this portion of the calendar year when habitat is limited by baseflow conditions and the fish become habitat generalists. For this reason, the flow recommendations for the baseflow period were developed using standard R2CROSS modeling procedures employed by the CWCB. Data was collected at five different riffles, including four representative riffles specifically selected for R2CROSS analysis, and one riffle located within the PHABSIM modeling reach. The results of those five data sets were averaged. It is important to note that the 100 cfs recommendation for this period meets only 2 of the 3 instream flow criteria, even though a significant portion of this time period is during late summer and fall, when fish are still very active. In this case, water availability of this low elevation semi-arid stream segment was carefully considered, and a decision was made to reduce the recommendation from 200 cfs to 100 cfs during the late summer, fall, and winter.

  The whole premise of the R2CROSS Methodology used by CPW and CWCB is that if adequate riffle habitat is protected, all other types of habitat should also be protected. R2CROSS is the most common methodology used by CPW to develop ISF recommendations and the most familiar to the CWCB. The R2CROSS Methodology uses three ISF hydraulic parameters (average depth, percent wetted perimeter, and average velocity) to develop biologic ISF recommendations. Many years ago, CPW researchers determined that maintaining these three hydraulic parameters at adequate levels across riffle habitat types also maintains aquatic habitat in pools and runs for most life stages of fish and aquatic invertebrates (Nehring 1979; Espegren 1996). The intent and basis for all instream flow recommendations made by CPW and BLM using R2CROSS is to protect and preserve the entire natural environment of a segment to a reasonable degree. The underlying basic assumption of the R2CROSS method is that if we protect riffles, the fishery is protected.

- The Opponent's claim that the recommended flow rates maximize habitat ignores the fact that during most of the year, the recommended flow rates provide substantially less than 100% of weighted usable area. During the 61-day period of the year when a high percentage of weighted usable area is protected, the peak flows of the Dolores River significantly exceed the recommended 900 cfs flow rate in at least 50% of water years.

  The table provided on page 9 of the CWCB Staff Analysis and Recommendation sets forth the "Percent of the Weighted Usable Area Protected" and the "Number of R2CROSS Criteria Met" at various times of the years under the proposed flow rates. it is important to note that the recommended flow rates during the April 15 to June 14 period have already been reduced by 300 cfs from the 1200 cfs flow rate suggested by the PHABSIM modeling for bluehead suckers. The rationale for this reduction includes the following:

  1. The Anderson and Stewart Reports noted that "Among different species habitats, we found that bluehead sucker habitat was the most indicative for the habitat needs of the native fish assemblage overall." (Anderson and Stewart 2007). Therefore, preserving a majority of the bluehead sucker habitat increases the probability that the habitat of all native species, including roundtail chub, will be preserved. With this in mind, CPW and BLM prioritized protection of bluehead sucker habitat.

  2. The PHABSIM modeling suggested a flow rate of 1,200 cfs to provide the maximum amount of weighted usable habitat for bluehead sucker. Instead, CPW and BLM reduced the flow rate to 900 cfs, which provides approximately 95% of weighted usable area for bluehead sucker. BLM and CPW concluded that protecting 95% of weighted usable area is very close to 100%, and can be achieved with a 300 cfs reduction in the recommended flow. Thus 900 cfs is the most efficient flow rate at which substantial habitat protection can be achieved.

  3. Even though 900 cfs is a large flow rate, this flow rate would be protected for only 61 days under the proposed ISF water right, or only 16.7% of the calendar year, during a period when peak flows are absolutely critical for native fish reproduction.

  4. Protecting 900 cfs for only 61 days, when the flow recommendations for the remainder of the year protects only 9.5 to 64.8% (see Figure 6) of weighted usable area for bluehead suckers, cannot be construed as "maximizing habitat." Rather, protecting 900 cfs for a 61-day period means that BLM and CPW have developed a highly targeted and efficient flow rate that is the minimum necessary for preserving the natural environment.

  The 900 cfs recommendation must also be considered in light of median flows during this period, which range from approximately 900 to 2000 cfs. The water availability analysis provided as part of the CWCB Staff Analysis and Recommendation shows that

historically, the fish population has enjoyed a much higher range of flow rates during the April 15 to June 14 period than the proposed ISF rate. Figures 3, 4, and 5 illustrate example flows in the proposed reach during a year when there is sizable spill of 185,000 acre-feet, during a year when there is a modest spill (85,000 acre-feet) from McPhee Reservoir, and a dry year when there is no spill from McPhee Reservoir. The proposed ISF flow rate protects a significant percentage of peak flows and natural variability, but cannot be considered to protect anything resembling either all of the flow or all of the hydrologic variability during this period.

Figure 3: Median Flow Rates in Proposed ISF Reach During 2008 (185,000 AF spill)

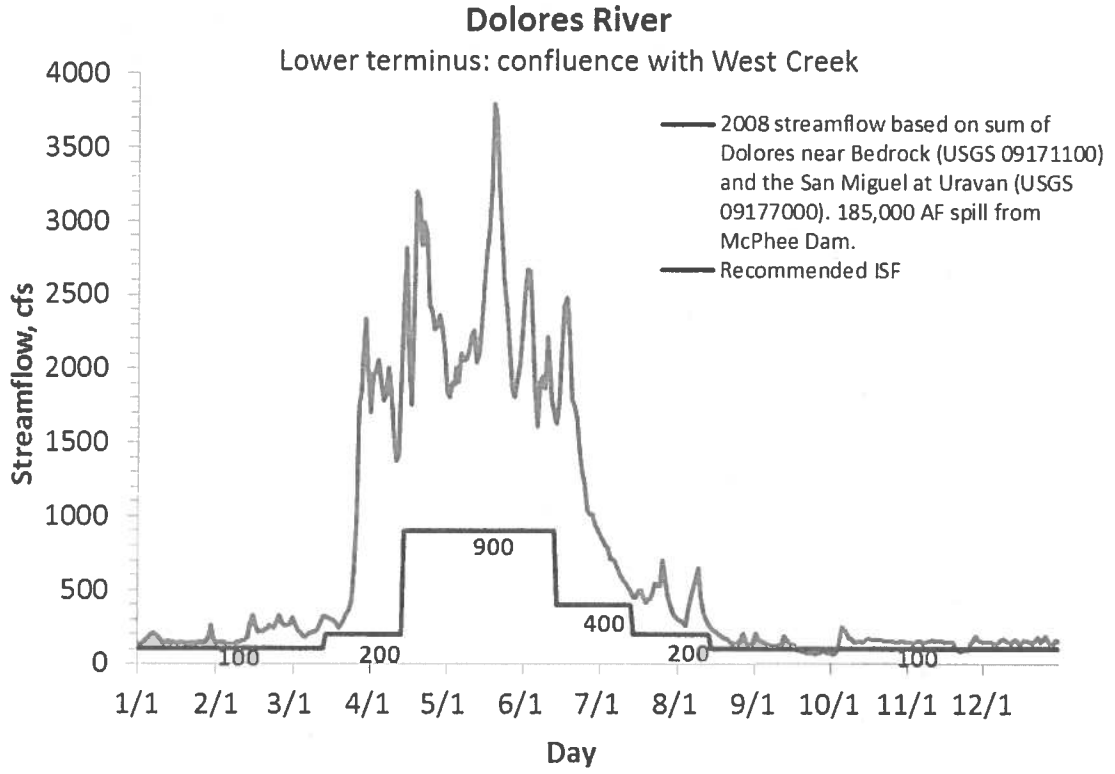


Figure 4: Median Flow Rates in Proposed ISF Reach During 2009 (65,000 AF spill)

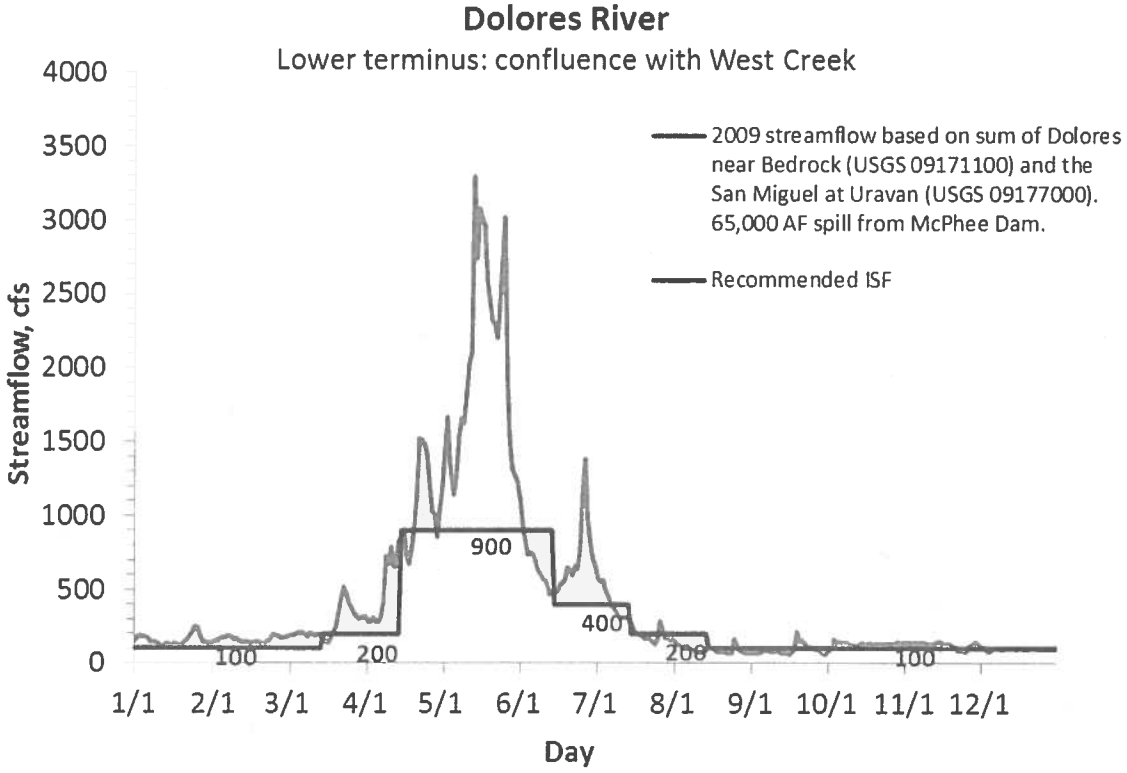
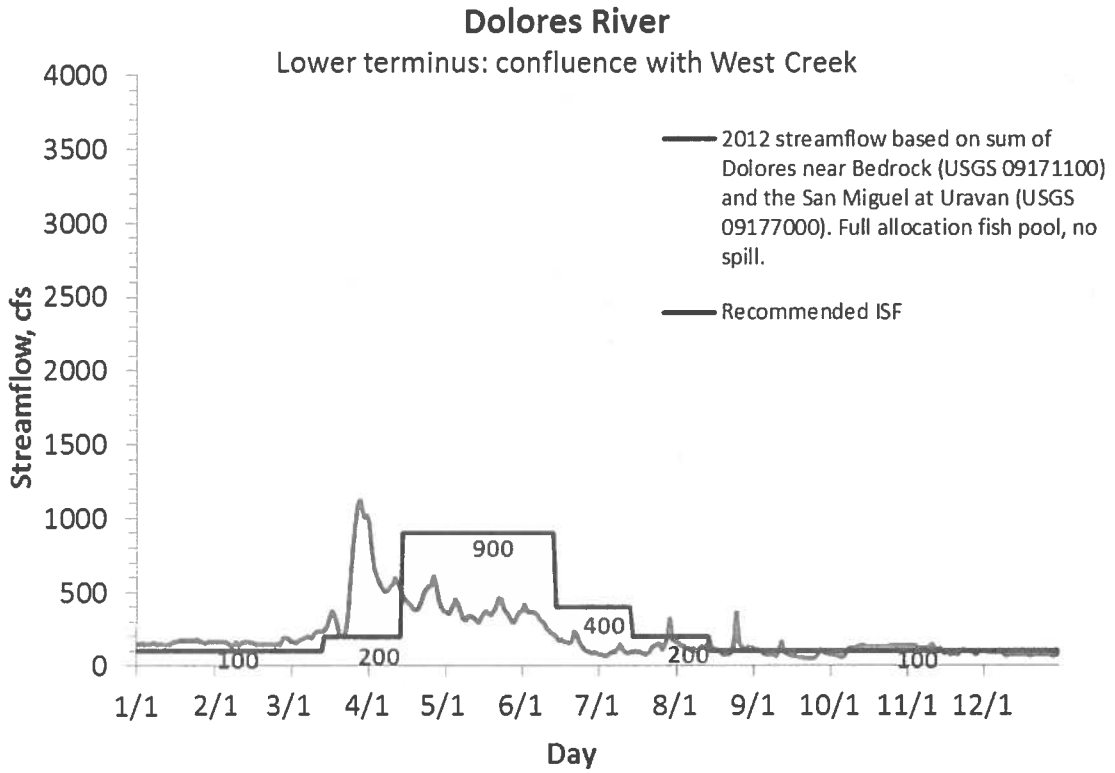


Figure 5: Median Flow Rates in Proposed ISF Reach During 2012 (no spill)



When CPW and BLM developed flow recommendations for the June 15 to August 14 period, water availability was a controlling factor. Rather than suggesting that all available flow be appropriated, BLM and CPW elected to set flow rates that would provide a reasonable percentage of weighted usable area for bluehead sucker, ranging from 31 to 61% (see Table 2). Further reductions in recommended flows were carefully considered, but ultimately rejected. They were rejected because at flows of 500 cfs or less, the weighted usable area curve is very steep, resulting in significant loss of bluehead sucker habitat for every increment that flows are reduced. For example, a reduction in flow from 400 cfs to 280 cfs changes the protected weighted usable area from 61% to 41% for bluehead sucker. Similarly, a reduction from 280 cfs to 96 cfs reduces the protected weighted usable area for bluehead sucker from 41% to 5%. See Figure 6 below for a table showing weighted usable area that is available at various flow rates.

Table 2: Weighted Usable Area (WUA) Available in Dolores River For Flannelmouth Sucker and Bluehead Sucker

Dolores River PHABSIM Results for Adult FMS and BHS (San Miguel River to Gateway)

Q	WUA FMS	WUA BHS	Total SA	FMS Habitat Espressed as a % of the peak of the WUA curve	Expressed as a % of total SA	BHS Habitat Espressed as a % of the peak of the WUA curve	Expressed as a % of total SA
96	9084	4077	84510	9.477	10.749	4.591	4.824
185	35187	28510	103110	36.710	34.126	32.102	27.650
225	39064	26100	108520	40.755	35.997	29.389	24.051
240	40095	29015	109875	41.831	36.491	32.671	26.407
280	49218	36420	112520	51.349	43.742	41.009	32.368
318	53210	41950	114890	55.514	46.314	47.236	36.513
400	62150	54185	116220	64.841	53.476	61.012	46.623
478	71204	61025	121050	74.287	58.822	68.714	50.413
680	88240	75640	124015	92.061	71.153	85.171	60.993
872	95850	83960	126410	100.000	75.825	94.539	66.419
1200	92251	88810	131850	96.245	69.967	100.000	67.357
1500	90015	77125	137845	93.912	65.302	86.843	55.951
1750	86100	63510	140258	89.828	61.387	71.512	45.281

Q = Discharge in cfs
WUA = Weighted Usable Area (sq ft/1000 ft)
FMS = Flannelmouth sucker adults
BHS = Bluehead sucker adults
SA = Surface Area (sq ft)

- The opponents claim that the proposed ISF flow rates are not scientifically supported. The opponents express concern that the proposed ISF rates from June 15 through August 14 result in an appropriation of a high percentage of the available flows and therefore may not be the minimum necessary to preserve the natural environment. This assertion is based not upon a review of the biological and modeling data, but rather upon a concern that the proposed ISF may interfere with the exercise of new junior water rights. However, the biological justification for the proposed flow rates during this period is robust and strong. During this period, new fish are being recruited into the adult fish population, and existing adults are building up energy stores that enable them to survive during the low flow period between August 16 and March 15, when physical habitat is very limited and there is intense competition for food. Providing peak flows during spawning periods does not preserve fish populations if they cannot take advantage of the critical growth and energy storage period that follows spawning.

1F. It is inappropriate for the CWCB staff to present "various options for defining the minimum streamflow necessary to preserve the natural environment to a reasonable degree." (See Southwestern Water Conservation District Prehearing Statement, page 11.)

The CWCB retains technical staff and requests recommendations from third parties because the Board requires scientific expertise and professional judgment in making ISF appropriations. That scientific and professional expertise lies with the CWCB staff and the recommending agencies. The CWCB board members are the appointed and confirmed decision makers in the ISF appropriation process and it is unreasonable (given the wide range of CWCB responsibility) to expect the CWCB's individual members to not rely upon the specialized professional knowledge and skill that the CWCB staff and recommending agencies bring to bear on the ISF appropriation process. Prior to presenting ISF recommendations to the Board, the CWCB staff considers all of the factors that could conceivably go into developing "options" for defining ISFs, using their scientific expertise and professional judgment. It would be inappropriate to ask Board members to forego that expertise and judgment.

2. **Opponents claim that the proposed appropriation does not properly "correlate the activities of mankind with some reasonable preservation of the natural environment." Arguments 2A and 2B rebut this claim.**

2A. Seeking protection of <u>minimum</u> flow rates correlates the activities of mankind with reasonable protection of the natural environment.

The BLM and CPW review of the SJRIP Report, the Stewart and Anderson Reports, and the Miller Reports indicates that the goal of preserving the type of natural environment found in the Dolores River could justify preserving much higher flow rates, including bankfull flows, periodic flood events, and high base flows. By preserving only the minimum flows thought necessary for the natural environment to persist, the CWCB is allowing for both present and future uses of water by humans and is therefore correlating the activities of mankind into the ISF appropriation process. The proposed appropriation does not disturb the exercise of a very large volume of existing conditional and absolute senior water rights in the Dolores and San Miguel River basins, and it does not appropriate all remaining water, thus allowing for establishment of new junior water rights. When both existing water uses and future water needs can be accommodated in the context of a proposed ISF appropriation, the CWCB has fulfilled its duty to correlate the activities of mankind with some reasonable preservation of the environment.

2B. The proposed appropriation is reasonable, because it assists with ensuring the continued existence of three species that could be listed as either threatened or endangered under the Endangered Species Act.

The State of Colorado and the Bureau of Land Management are signatories to the "Three Species Agreement" which is a conservation strategy for flannelmouth sucker, bluehead sucker, and roundtail chub. This agreement is also signed by fish and wildlife management agencies of six Colorado River basin states (AZ, NV, NM, UT, WY, and CO), four BLM State Offices (CO, WY, UT, and NM), two U.S. Fish and Wildlife Service regions (Mountain and Prairie Region and Southwest Region), the U.S. Bureau of Reclamation (Upper Colorado Region), the Southern

Ute Tribe, and the Jicarilla Apache Tribe. The objective of the agreement is to prevent a listing of any or all of the three species under the Endangered Species Act, which could have the effect of seriously limiting future water development on all rivers that are determined to have suitable habitat. The agreement specifically calls for legal protection of flows on streams that are known to have intact, functional populations of the three species. The foundation of the Three Species Agreement is based upon a large body of peer-reviewed science. By signing this Agreement, the signatories accept that the underlying science is legitimate. The signatories also accept that the action items set forth in the Agreement are reasonable actions to prevent a listing of any or all of the three species, given all of the authorities and legal responsibilities of the signatories.

When a proposed ISF appropriation is evaluated for whether it is "reasonable," the evaluator must consider whether the natural environment to be preserved is unique or sensitive, and also must consider the conservation status of the species and communities in question. In short, a proposed ISF appropriation to protect brook trout, which are common and widespread, must be evaluated differently from a proposal to protect species that are either in decline or have limited distribution. Given that the proposed ISF reach contains one of the best examples of a warm water native fish assemblage in Colorado, and given that the proposed appropriation accomplishes important state and federal objectives, the proposed level of protection can be considered "reasonable."

REBUTTAL TO OPPONENTS' LEGAL ARGUMENTS

1. **Opponents assert that the CWCB should be presented with a range of flow protection options, so that the board can make an informed policy determination about correlating the needs of mankind with some reasonable preservation of the environment. Arguments 1A and 1B rebut this assertion.**

1A. The "alternative proposals" that are allowed for in CWCB Rule 5N do not mean that the CWCB should be presented with a range of flow protection options.

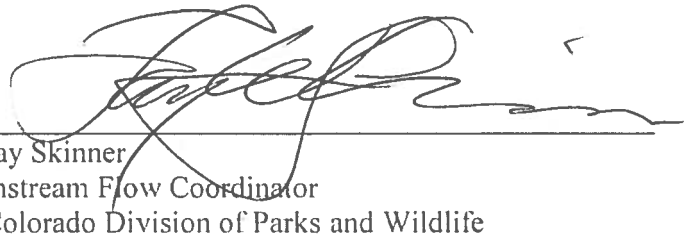
The "alternative proposals" that are allowed for under CWCB Rule 5N, allow for parties to instream flow proceedings to present specific, alternative flow protection proposals supported by scientific data that the party believes would accomplish the objective of the instream flow program. The regulations do not call for CWCB staff or for recommending entities to present a range of flow protection options. In fact, by calling upon recommending entitities to submit recommendations with specificity and in writing (see CWCB Rule 5b and the ISF program statutes, 37-92-102(3)), the CWCB rules and statutes by definition request recommending entities to utilize their scientific expertise and professional judgment to deliver specific recommendations. The Oxford English Language Dictionary defines recommendation as "A suggestion or proposal as to the best course of action, especially one put forward by an authoritative body." By requesting a recommendation, the CWCB is not requesting a range of instream flow protection options.

1B. Providing the CWCB with a range of flow protection options would be "arbitrary and capricious."

The methodologies used by CPW and BLM to develop instream flow recommendations are widely accepted scientific methodologies and have been used the CWCB for a long period of time. The methodologies are designed to suggest specific flow rates that are then reviewed by personnel with scientific expertise and on-the-ground knowledge of the stream in question. Professional judgment is required to identify flow rates that accomplish the objective of preserving the natural environment while considering other important factors, such as water availability. Providing the board with a range of protection options ignores the role that scientific expertise and professional judgment play in the CWCB's deliberations, and would result in appropriations that could be determined to be "arbitrary and capricious."

Respectfully submitted this 17th day of August 2015.

FOR THE COLORADO DEPARTMENT OF NATURAL RESOURCES, COLORADO PARKS AND WILDLIFE



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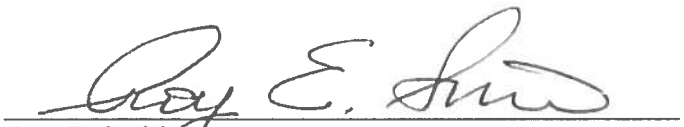
FOR THE U. S. DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT



Roy E. Smith
Water Rights and Instream Flow Coordinator
Bureau of Land Management
Colorado State Office
2850 Youngfield Street
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CERTIFICATE OF SERVICE

I hereby certify that I have duly served the copies of the foregoing **REBUTTAL STATEMENT OF THE BUREAU OF LAND MANAGEMENT AND COLORADO PARKS AND WILDLIFE** upon all parties listed herein by email this 17th day of August 2015, addressed as follows:

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