TO: Colorado Water Conservation Board Members

FROM: Linda Bassi, Chief
Jeff Baessler, Deputy Chief
Stream and Lake Protection Section

DATE: May 8, 2014

SUBJECT: **Agenda Item 22, May 21-22, 2014 Board Meeting**
Proposed Approach to Instream Flow Protection for Riparian Communities

Introduction

The Board's Instream Flow ("ISF") Program provides for preservation of the natural environment to a reasonable degree. In most cases, the natural environment preserved by ISF appropriations has been defined by the flow needs for aquatic species. However, in some instances, the Board has appropriated ISF water rights that provide additional protection for other aspects of the natural environment such as riparian vegetation and other life forms. In addition, it has been recognized that in most cases, ISF quantification of flows for ISFs to meet the needs of aquatic species will provide for some de facto protection of the riparian corridor.

In some cases, the scientific literature indicates that annual peak flood flows are needed to preserve certain riparian communities. Although the Board has appropriated all of the unappropriated flow in some streams to address situations that required such riparian protection, there are other approaches to protecting riparian communities that do not require all of the unappropriated flows.

In Water Division 4, the BLM has published a draft land use plan for Dominguez-Escalante National Conservation Area which determines that Cottonwood Creek is suitable for Wild and Scenic River designation based upon riparian vegetation communities deemed Outstandingly Remarkable Values ("ORVs"). In addition, the BLM has determined that two similar streams managed by the Uncompahgre Field Office, Potter Creek and Monitor Creek, are eligible for Wild and Scenic River designation. As part of the planning efforts for these two jurisdictions, the BLM is evaluating management alternatives that would provide the best chance for continued existence of these ORVs. As a potential alternative to a federal reserved water right that would be created if Congress designates these streams into the National Wild and Scenic Rivers System, the BLM has proposed an approach that would utilize the ISF Program to provide direct protection of these ORVs. Staff and the BLM will present this approach at the Board meeting for discussion and input. This is an informational item and no Board action is required.

Background

Section 37-92-102(3), C.R.S. (2013) vests the Board "with the exclusive authority, on behalf of the people of the state of Colorado, to appropriate …, such waters of natural streams and lakes as the board

determines may be required for minimum stream flows or for natural surface water levels or volumes for natural lakes to preserve the natural environment to a reasonable degree." Since the ISF Program's inception in 1973, the Board has based ISF appropriations on aspects of the natural environment to be preserved that include not only the presence of aquatic species, but also other natural features and life forms. Over the years, ISF water rights have been appropriated in varying amounts to preserve aspects of the natural environment including, but not limited to, various aquatic vertebrate and invertebrate species; riparian vegetation communities; terrestrial wildlife including birds, mammals, amphibians and reptiles; and even physiographic aspects such as sediment transport that is critical to the maintenance of biologic habitats. Although quantification of the amount of water needed is typically tied to the requirements of aquatic species, in limited instances, the Board has appropriated flows quantified for some of the above mentioned aspects of the natural environment.

BLM Wild and Scenic River Determinations for Vegetation ORVs

In May 2013, the BLM identified a 14.4 mile reach of Cottonwood Creek, located in the Dominguez-Escalante National Conservation Area, as a stream that is suitable for inclusion in the National Wild and Scenic Rivers System.[1] Although BLM recognized that an ISF water right for 3.0 cfs (April 1 – June 15) exists on this segment of Cottonwood Creek, the suitability recommendation was based on the need to directly protect the vegetation ORV, described as an exemplary occurrence of narrowleaf cottonwood/skunkbush sumac riparian woodland. In addition, BLM has indicated that Cottonwood Creek provides spawning habitat for flannelmouth sucker and bluehead sucker, which appear on BLM's sensitive species list.

In response to the draft suitability finding on Cottonwood Creek, the CWCB submitted a letter dated July 29, 2013 (attached) to the BLM's Grand Junction Field Office. The letter outlines the Board's concerns and previous correspondence regarding the issue, and requests the BLM to defer finding Cottonwood Creek suitable while BLM and CWCB work together to develop an appropriate ISF water right that would provide the desired protection for the vegetation ORV.

In addition to Cottonwood Creek, BLM's Uncompahgre Field Office currently manages two streams adjacent to Cottonwood Creek on the east side of the Uncompahgre Plateau as eligible for Wild and Scenic designation because the riparian community has been identified as an ORV. Both Monitor Creek and Potter Creek support a narrowleaf cottonwood/strapleaf willow/silver buffaloberry community, which is classified as vulnerable throughout its range by the Colorado Natural Heritage Program (CNHP)[2]. Although the streams are presently managed as eligible, BLM has indicated that a draft land use plan for the Uncompahgre Field Office containing suitability determinations will be released during summer 2014. Since Potter Creek and Monitor Creek have identical ORVs, and very similar hydrology and landscape position, it is reasonable to assume that these two streams will also be determined to be suitable in the forthcoming draft land use plan. Although CWCB does not have an ISF water right on Monitor Creek, it does have a multi-stage ISF water right on Potter Creek for 1.8 cfs (3/1-3/31), 4 cfs (4/1-6/15), 1.8 cfs (6/16/-7/31), and 1.4 cfs (8/1-2/29). This ISF was based on the R2Cross

[1] This finding was set forth in the Dominguez-Escalante National Conservation Area (NCA) Draft Resource Management Plan (RMP)/Environment Impact Statement (EIS), dated May 2013.

[2] The Colorado Natural Heritage Program is Colorado's only comprehensive source of information on the status and location of Colorado's rarest and most threatened species and plant communities. It is administered by both Colorado State University and Colorado Parks and Wildlife. CNHP has been a valuable resource to the Basin Roundtables in helping to identify their environmental attributes.

quantification methodology to preserve speckled dace and longnose sucker, both of which are native fish species.

Functions and Water Needs of Riparian Communities

Riparian communities are universally recognized by the scientific community as an integral part of all stream ecosystems. Riparian vegetation provides: (1) shade to reduce water temperatures, and (2) organic matter that provides the base for the aquatic food web. In turn, many riparian areas rely upon annual snow melt runoff flows and periodic higher flows over short time periods. Scientific literature indicates that cottonwood reproduction is highly dependent upon annual flood events (Mahoney and Rood, 1998). During these events, new sediments are deposited, creating locations where seeds can germinate and clones can establish root systems. The flood events also recharge the alluvial aquifer, allowing seedlings to tap a ready water supply and then send out a tap root to chase the water supply as the flood flow gradually recedes. Other studies have indicated that riparian abundance, in the form of foliage area, stem basal area, and stand width, are directly correlated with annual flood water volume (Stromberg, 1993). Further, the interdependence between the stream and riparian ecosystems can result in unique natural environments where rare species and/or assemblages of plants and animals have adapted to these annual flow cycles. In many cases, these species may be so rare as to only be found in similar habitats and may even be considered to be imperiled due to the loss of such habitat.

History of ISF Protection for Riparian Communities

Over the course of the ISF Program, the riparian aspects of the natural environment have almost always been documented and evaluated by staff when bringing proposed ISF appropriations to the Board. It has been recognized that although direct protection may not always be afforded to riparian communities, some de facto protection is provided by standard quantification methodologies that are based on the needs of fisheries or other aquatic life forms. For example, as part of the recent 2014 appropriation for an increase to the Slate River ISF water right, staff and the BLM associated the need for the increase in part with the need to provide some additional protection to the riparian communities along the stream segment. The following is an excerpt from the 2014 Executive Summary for the Slate River:

> "In parts of the river confined by narrow canyons, the riparian community consists of a blue spruce and willow community. In parts of the river that flow through a wider river valley, the riparian community consists of various willow species, river birch, rushes, and sedges. The nonconsumptive water needs assessment performed by the Basin Roundtable identified this stream segment as having significant riparian communities worthy of protection."

In some instances, the Board has recognized a need for even greater direct protection of some unique riparian communities. In the case of the 1996 Hanging Lake and Dead Horse Creek appropriations, the Board determined that all of the unappropriated water in this stream and lake system was required to preserve the natural environment to a reasonable degree. The reason for such an unusual ISF appropriation had to do with the fact that these natural environments are unique, consisting of distinct assemblages of riparian vegetation, endemic hanging garden communities and globally imperiled species.

On both Big and Little Dominguez Creeks in 2011, the Board again appropriated all of the unappropriated water to preserve both aquatic and riparian aspects of the natural environment. These ISF appropriations not only preserved distinct fish populations, but also protected amphibians, aquatic

insects and increasingly rare and distinctive communities of cottonwood trees and other associated riparian vegetation. Another important objective for these appropriations was to maintain the creeks in their natural pristine condition due to their location in a designated Wilderness Area.

Quantifiable Direct Riparian Protection

In response to the Board's July 2013 request to defer the suitability finding on Cottonwood Creek, and recognizing that similar findings are likely for both Monitor and Potter Creeks, the BLM has proposed a concept that would preserve the riparian communities of these streams under the ISF Program. The proposed concept consists of two components – a base flow component (utilizing typical ISF quantification methodology) and a riparian flow component. CWCB and CPW staff have reviewed the proposal and concur that such an approach would be effective to preserve certain riparian communities and could provide an alternative to a potential federal reserved water right.

While the proposal would call for the appropriation of some water during annual flood events to directly preserve the riparian communities on these segments, it would not require appropriating all the unappropriated flows as in the Deadhorse Creek, Hanging Lake and Big and Little Dominguez Creeks appropriations. In addition, staff anticipates that this proposed approach would be recommended only under limited circumstances, such as addressing the federal resource protection issues on these three streams and potentially on other streams in lieu of a federal reserved water right where there are similar protection concerns; and on streams that support riparian communities identified as rare by the CNHP or identified by Basin Roundtables as valuable environmental attributes. Additionally, this proposed approach would be best suited to streams where very limited water use occurs and where there is a small possibility of increased water use in the future.

Base Flow Component

The base flow component of the proposed ISF water right would be based upon an R2Cross analysis using the typical ISF criteria employed by the CWCB – average velocity, average depth, and wetted perimeter. The ISF water right would be designed to meet two of three criteria in the winter and three of the three criteria during the summer. The amount of water to be appropriated for the base flow component would be limited by a standard water availability analysis to ensure that the flow rates appropriated are available at least 50% of the time.

The base flow rates would provide habitat for spawning and emergence activities of flannelmouth sucker and bluehead sucker on Cottonwood Creek, and speckled dace and longnose sucker on Potter Creek. In addition, the base flow component would help maintain moisture levels in the alluvial aquifer that are essential to supporting the riparian community. Scientific literature has demonstrated that the vigor, extent, and basal area of cottonwood-willow communities is directly related to the supply of water in streamside alluvial aquifers and that declines in alluvial water levels are directly related to plant mortality (Shafroth, et al, 2000). The base flow component of the water right would be in effect year-round. During the April 1 - May 31 timeframe, the base flow component would be supplemented by a riparian flood flow component.

Riparian Flow Component

As previously mentioned, scientific literature indicates that cottonwood reproduction is dependent upon annual flood events and subsequent sediment deposition that provides locations where seeds can germinate and clones can establish root systems. In addition, these flood events recharge the alluvial

aquifer, ensuring successful recruitment of the seedlings and preservation of a healthy, abundant and diverse riparian cottonwood community that includes multiple other species.

For this component of the ISF water right, BLM proposes to utilize WinXSPro software to identify the flow rate necessary to periodically flood the riparian community. WinXSPro is an interactive software package developed by the USFS and is designed to analyze stream channel cross section data for geometric, hydraulic and sediment transport parameters. BLM would survey the stream channel to identify typical stream channel morphology, and then establish 2–3 cross sections that are representative of the stream channel. For each cross section, BLM would identify the bankfull location and the location marking the first terrace above the active channel where the majority of the riparian community is located. Then, BLM would take discharge measurements at various flow rates in these cross sections. This data would be input to the WinXSPro software to calculate the flow rates needed to wet the bankfull location and the terrace location.

The riparian flood flow component of the ISF water right would protect flows between the bankfull flow rate and the flow rate needed to flood the terrace. Once bankfull flows are reached, the ISF water right would also protect the gradual reduction in flows that is essential for riparian community reproductive processes, also known as the "receding limb of the hydrograph." Once the riparian flood flow component of the water right is activated, receding flows would be protected until flows decrease to the flow rates established as the base flow component of the ISF water right, or until May 31, whichever event occurs first. The receding flow rates are defined as flow rates between terrace flow and the base flow rate of the ISF water right.

Under this proposed approach, the riparian flood flow component of the ISF water right would be administered in the following manner:

- *Activation of Riparian Flood Flow Component* - The critical functions of flood flows occur in the range between bankfull flow and the terrace flow. Accordingly, the riparian flood flow component will be activated only when flows reach at least bankfull stage. Before flows reach bankfull stage, the flow rates above the base flow of the ISF water right but below the bankfull flow rate are available for appropriation by others.

- *Duration of Flood Flow Component* - In advance of the April 1– May 31 snowmelt runoff period, it is impossible to know exactly when peak snowmelt flows will occur. Generally, peak flows on the east side of the Uncompahgre Plateau occur between May 1 and May 10, but can be accelerated or delayed by annual weather patterns. This means that the flood flow component could be activated very early or very late in the April 1 – May 31 period. In dry years, the flood flow component of the water right will not be activated at all if flows in the creek never reach bankfull stage. The duration of peak flows and the receding limb of the hydrograph are also impossible to predict. Accordingly, the flood flow component of the water right could be in effect for a period as short as two weeks or for as long as two months.

- *Deactivation of Riparian Flood Flow Component* – If the riparian flood flow component is activated in a given water year, it will be deactivated when flows recede to the base flow rate of the ISF water right then in effect, or on May 31, whichever occurs first. This means that the riparian flood flow portion of the water could be as short as two weeks or as long as two months. The rationale for the variable deactivation period is that riparian community reproduction is

highly dependent upon gradual reduction in flows. Therefore, the receding limb of the hydrograph must be protected from new appropriations.

- *Administration of Priorities* – BLM anticipates that day-to-day administration of the ISF water right will likely not be required, except in the unlikely event of a junior appropriation on the very limited amount of private lands in the watershed. If a junior appropriation does occur (beyond the de minimis threshold used by CWCB), a gage will be installed on the creeks for the purpose of administering the base flow portion ISF water right. A monitoring station upstream from all diversions would also be used to determine when bank full flow is achieved, thereby activating the riparian flood flow component of the water right.

BLM and CWCB staffs anticipate that the riparian flood flow component of the ISF water right will be activated only during average to wet years. In addition, it is anticipated that the riparian flow component of the ISF water right will have the longest activation period during wet years, and a shorter activation period during average years.

Staff's preliminary consultation with the Division of Water Resources indicates that this type of ISF water right would be administrable, provided that the CWCB installs any measuring devices required by the DWR for administration.

Conclusion

Using this proposed approach would require the CWCB to modify its typical water availability analysis, because by definition, flood flows may not be available at least 50% of the time during the relevant period. On the three creeks discussed in this memo, two factors support modifying the analysis. First, the streams are located in headwaters areas with very little private land, so opportunities for water development are extremely limited. In addition, all of the water subject to the ISF appropriation will be available for appropriation and use on the floor of Uncompahgre Valley after it exits the protected ISF stream reaches.

This proposed approach also would result in CWCB structuring the ISF water right differently than typical appropriations. This atypical structure could be based upon the need to address unique water-dependent values in a manner that serves as a viable alternative to Wild and Scenic River designation and federal reserved water rights.

Attachment

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July 29, 2013

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Subject: Grand Junction Field Office (GFO) Dominguez-Escalante (D-E) National Conservation Area (NCA) Draft Resource Management Plan (RMP)/Environment Impact Statement (EIS)
Cottonwood Creek

Dear Ms. Stevens:

The Colorado Water Conservation Board (CWCB) would like to take this opportunity to comment on the Bureau of Land Management (BLM)'s recommended alternative (Alternative E) that finds 14.41 miles of the Cottonwood Creek suitable for inclusion in the National Wild and Scenic Rivers System (NWSRS), as presented in the Dominguez-Escalante (D-E) National Conservation Area (NCA) Draft Resource Management Plan (RMP)/Environment Impact Statement (EIS). This segment of Cottonwood Creek is being recommended by the BLM under the NWSRS wild classification to protect the vegetation outstanding remarkable value (ORV) which is described as an exemplary occurrence of narrowleaf cottonwood/skunkbush sumac riparian woodland.

In its Suitability Report (Appendix O of the Draft RMP/EIS), the BLM recognizes that the CWCB holds an instream flow (ISF) water right (decreed in Case No. 4-06CW166 for 3.6 cfs from April 1st to June 15th) on Cottonwood Creek for the protection of fish. However, the BLM asserts that additional water above and beyond the existing ISF is required to protect the vegetation ORV as stated Draft RMP/EIS:

> The current instream flow appropriation held by CWCB does not create the type of seasonal flow variation necessary to protect the vegetation type identified as the ORV. The narrowleaf cottonwood/skunkbush sumac riparian woodland requires high, flooding spring flows in the spring and minimal flows throughout the remainder of the growing season.

Representatives of the Colorado Department of Natural Resources (DNR) participated in the Gunnison River Basin Stakeholder Group ("Stakeholders") that resulted in a letter to the BLM

dated April 29, 2011 which recommended that this reach not be found suitable. A copy of that letter is attached for your convenience. The Stakeholders were comprised of landowners, farmers, ranchers, outfitters, water providers, water managers, recreational prospectors, electrical utility representatives, all-terrain vehicle riders, river recreationists, local governments, the State of Colorado, and interested citizens.

Additionally, on October 5, 2012, the CWCB staff provided the following comment to the BLM on a working draft of the D-E NCA RMP/EIS:

> As a general matter, the CWCB does not support identifying and managing stream segments as suitable, because such management could negatively impact the State's ability to fully develop its Colorado River compact entitlements. Consequently, the CWCB does not support the finding of suitability for Cottonwood Creek.

The BLM's Response to the CWCB's October 5th comment is as follows:

> Will re-examine our rationale and determine whether a change should be made before the draft is published. This draft suitability finding was related to the desire to manage toward a hydrologic regime that would support rare riparian communities. From the BLM perspective, it is clear that Wild and Scenic designation would afford an opportunity to file a water right application to protect riparian values. However, if the Draft does include a determination that Cottonwood Creek is suitable, it doesn't preclude working with the CWCB to develop a feasible alternative to Wild and Scenic designation. Such a management alternative might include an instream flow water right appropriated by the CWCB that is designed to support the riparian community.

Based on the foregoing, the CWCB requests that the BLM defer finding the Cottonwood Creek suitable while the BLM and the CWCB work together on developing an appropriate ISF that would provide protection for the vegetation ORV.

The CWCB would like to thank you for considering our comments and hopes that the BLM will reconsider its preliminary suitability determination for Cottonwood Creek. We urge you to consider our comments in light of the fact that the BLM is required in their suitability analysis to consider "consistency of designation with other agency plans, programs, or policies and in meeting regional objectives" and "whether designation may impede the 'goals' of other tribal, federal, state, or local agencies." Please feel free to contact Suzanne M. Sellers of my staff if you have any questions.

Best regards,

James Eklund, Director
Colorado Water Conservation Board

cc: CWCB Members