ROARING FORK CONSERVANCY
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MEMORANDUM

TO: CWCB Board and Staff
FROM: Roaring Fork Conservancy
RE: Lease of Water in Ruedi Reservoir for Winter Release
Date: May 10, 2018

The Colorado River Water Conservation District ("District") has been in discussions with Roaring Fork Conservancy ("RFC") regarding the possibility of leasing water currently held under contract by the District for release from Ruedi Reservoir during the winter months under certain conditions. We would like to propose that this lease be held and funded by the CWCB using funds from the Board's Construction Fund as allowed under section 37-60-123.7, C.R.S..
The parameters of the lease would be as follows:

1. The District currently holds contracts with the US Bureau of Reclamation for a total of 11,413.5 af of water in Ruedi Reservoir, of which approximately 7,500 af is available for leasing. This water is held by the District for purposes of augmentation, direct supply, environmental enhancement and other purposes consistent with the District's authority. Those contracts do not restrict or limit the District's ability to lease any portion of that water to another party for similar purposes.
2. RFC has provided information showing the potential environmental impacts of low winter flows on the Fryingpan River and the benefits of augmenting those flows as detailed below. The objectives of the lease would be to 1) maintain Fryingpan River flows at a minimum of 70 cfs or 31 cfs above the current minimum flow of 39 cfs when temperatures and low flows combine to create anchor ice and 2) enhance environmental flows as determined via consult with Colorado Parks and Wildlife (i.e. post spawning).
3. A combination of flow levels and temperature creates icing conditions, so it is difficult to predict with certainty when, or in what amount releases would be necessary. For instance, extremely low temperatures could create anchor ice even when flows are already above the minimum of 39 cfs, while high temperatures could lead to ice-free conditions even when flows are at 39 cfs or below. It is reasonable to assume that eight weeks, or fifty-six days, is the maximum length of time that augmentation would be necessary during any given winter season. That time period would translate to approximately 3,500 af (31 cfs = 61.487 af/day x 56 days = 3,443 af) which is the amount we would propose for the lease.

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4. The mechanics of the lease would work as follows: RFC, through their river monitoring system and analysis of weather conditions, will call for additional releases when conditions are conducive to the formation of anchor ice, or when conditions might necessitate flows for environmental enhancement. Additional releases would be limited to the amount necessary to bring Fryingpan flows at Ruedi Dam up to 70 cfs. Releases would continue until anchor ice conditions abated or environmental enhancement is achieved, at which time RFC will notify the Bureau of Reclamation to halt additional releases. RFC will keep the District informed of the timing and amount of all releases with total releases between December and April not to exceed 3,500 af.
5. The CWCB will contract with the District pursuant to the District's current water marketing policy.
6. Releases may be suspended by Bureau of Reclamation when those releases preclude the Bureau from managing Ruedi Reservoir consistent with the Bureau's legal and regulatory obligations. Any such suspension will be accompanied by written communications to RFC, the CWCB and the District detailing the reason(s) for that suspension.
7. The term of the lease will be for one year beginning with the date of execution of the lease. An extension or renewal of the lease may be negotiated between the parties at their discretion.
8. The following summarizes the findings of previous studies of anchor ice and its impact on the Fryingpan River fishery:

   From **Summary Report: A Study of Macroinvertebrate Community Response to Winter Flows on the Fryingpan River - August 11, 2004 (Bill Miller):**

   - *Aquatic macroinvertebrate communities were evaluated as a means to elucidate the relationships between winter base flows, anchor ice and macroinvertebrates community structure. The magnitude of discharge may be the most important factor that influences macroinvertebrates during the winter months. (p16)*

   - *The formation and frequency of occurrence of anchor ice at FPR-TC appears to be a contributing influence on macroinvertebrate community structure and function. Recent data suggests that two or more concurrent winters with higher flows may be necessary to achieve an optimum balance in the macroinvertebrate community.(p18)*

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- *Results of this study suggest that magnitude of discharge and air temperature work together to influence anchor ice formation. The lower discharge at site FPR-TC in 2002-2003 was much more conducive to the formation of anchor ice than the higher flows during the following winter.(p.22)*

- *The available data suggest that anchor ice was at least partially responsible for the degraded condition of the macroinvertebrate community at FPR-TC during the spring of 2003. To alleviate anchor ice related stress to the macroinvertebrate community, an effort should be made to avoid low wintertime releases out of Ruedi Reservoir.(p.23)*

From **Summary Report: A Study of Macroinvertebrate Community Response to Winter Flows on the Fryingpan River - September 10, 2006 (Bill Miller):**

- *Results of this study suggest that magnitude of discharge and air temperature work together to influence anchor ice formation.(p.17)*

- *It appears that macroinvertebrate diversity and evenness recover in one to two years after severe anchor ice formation if winter flows remain greater than 70 cfs. • Flows greater than 70 cfs seem to result in less anchor ice in the upper half of the river than flows of approximately 40 cfs. (p. 22)*

9. Agreement from the U.S. Bureau of Reclamation that these releases will not interfere with or compromise their ability to manage the reservoir under most circumstances.
10. Agreement from Colorado Parks and Wildlife that these releases will not degrade or compromise habitat, biomass or other environmental conditions in and adjacent to the Fryingpan River.