

COLORADO RIVER RECOVERY PROGRAM
FY 2018 ANNUAL PROJECT REPORT

RECOVERY PROGRAM
PROJECT NUMBER: C-9

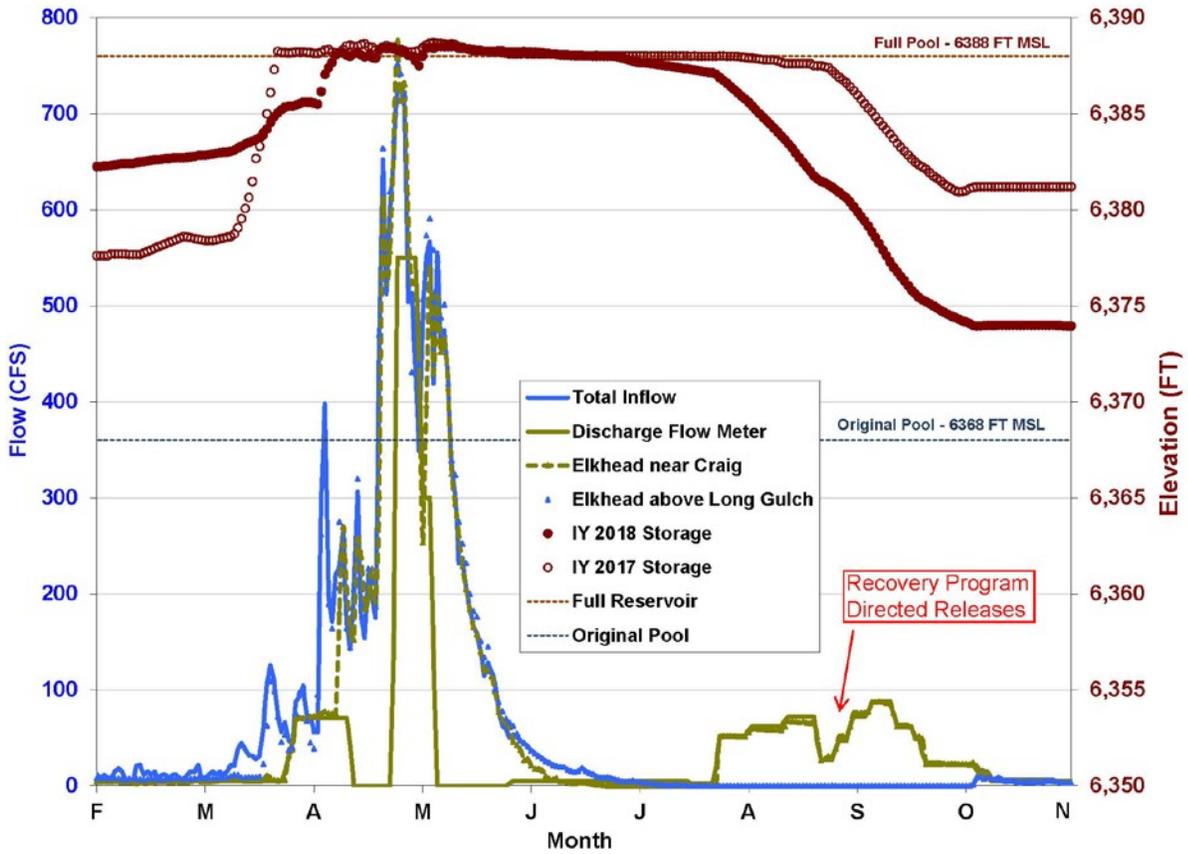
- I. Project Title: O&M for Elkhead Release and Elkhead Lease
- II. Bureau of Reclamation Agreement Number(s): 05-WC-40-420
- Project/Grant Period: Start date: 02/17/05
End date: Ongoing
Reporting period end date: 09/30/18
Is this the final report? Yes _____ No XX
- III. Principal Investigator(s): Ray Tenney
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IV. Abstract:

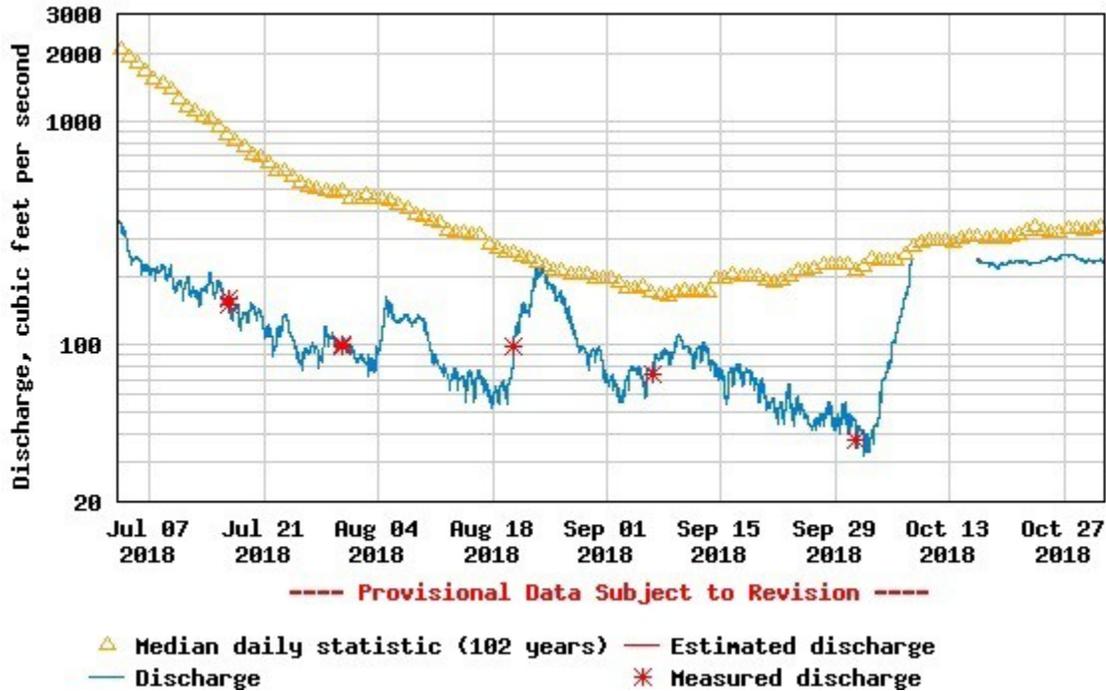
Operations

Elkhead Reservoir was operated in 2018 to release the Recovery Program's 5,000 acre feet of water and 2,000 acre-feet of additional water leased from the River District under the 2005 Short-Term Water Supply agreement as requested. Charges for leased water will be included in the 2018 calendar year (2018 CY) invoice to the Recovery Program. Weekly coordination calls hosted by the USFWS Regional Hydrologist set the release rate for the upcoming week. Releases were generally made from mid-August through late September following the Maybell gage flows as shown in the figures below. Low snow pack and resulting flows necessitated administration of the lower Yampa River by the Colorado State Engineer (SEO) for the first time ever.

Elkhead Reservoir IY 2018 Flows and Elevation

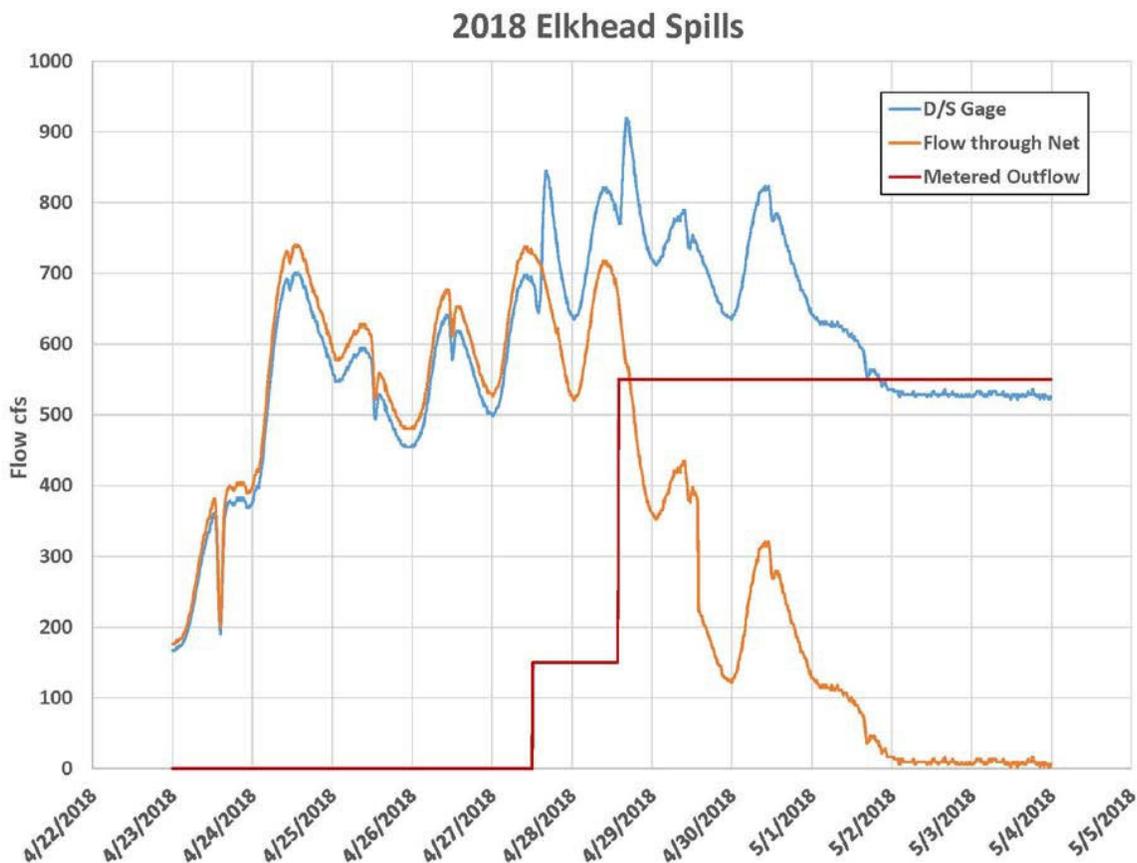


USGS 09251000 YAMPA RIVER NEAR MAYBELL, CO



Spillway Barrier Net

Spillway fish barrier net and debris boom installed in September 2016 remained in place over the second winter. The net efficacy evaluations by Colorado Parks and Wildlife (CPW) suggest some fish leakage. The net is designed to pass 2,500 cfs at 1.5 feet of surcharge on the downstream labyrinth weir. The net was observed to overtop in late April 2018 at flows exceeding 600 cfs. The operating practice since the installation of the net has been to reduce outlet works utilization and allow spills through the net during the 2 year warranty period to “test” the net. The figure below shows that opening the outlet works during the April 27th observation of net overtopping quickly reduced flow through the net and alleviated the overtopping. Outlet works operation avoided any further overtopping of the net.



On April 27th the reservoir was turbid from spring runoff and little visibility was available. CPW contractors were on site at the time of the observed over topping hand cleaning the net. The CPW contractor's assessment of the net condition from the cleaning can be obtained from CPW.

Representatives from Pacific Netting Products (PNP) were on site May 17th to inspect the net to the extent possible considering runoff water conditions. By this time all reservoir outflow was being routed through the screened outlet works. Conditions were only observable in the top several feet of net which could be pulled to the surface. Depth measurements were made along the net at mooring lines (anchor points) to confirm the net as constructed had adequate height in place. PNP recommended more thorough cleaning of the net using mechanical means such as pressure washing or pressure washer powered scrubbers as used in the aquaculture industry. CPW has worked to implement a more aggressive cleaning schedule and net conditions have been observed to be much better subsequent to the spring runoff.



Elkhead Net Fouling Observed May 17th

An observation of the net in August using a River District underwater camera revealed a potential source of fish leakage through the net. The space between the main cork line of the net and the top of the net shown in the photo below might allow fish passage. While there is a downstream skirt to prevent wave overtopping of the cork line from passing fish, the skirt cork line has similar smaller gaps.

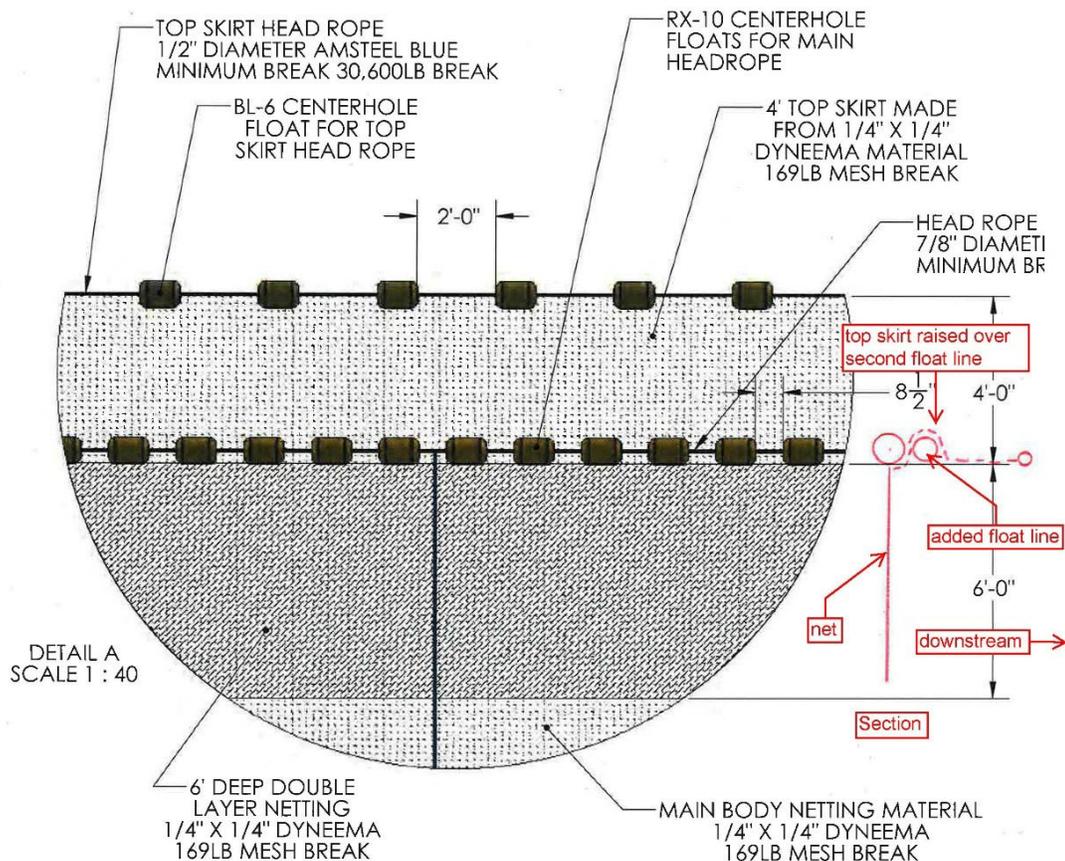


Gap Between Top of Net and Water Surface

PNP implemented a remedy for the net gap using the attached downstream skirt raised in front of the gap with a second cork line lashed to the original cork line. The raised skirt will cover the gaps left where the main cork line attaches to the net body. The additional cork line will add flotation to the net body.



Elkhead Net with Added Second Cork Line



Spillway barrier net project funding in the amount of \$500,000 was provided by the Colorado Water Conservation Board and \$844,673.89 provided by the USBR under Cooperative Agreement 05-WC-40-420 bringing the total spillway barrier net and debris boom project cost to \$1,345,023.15. One warranty inspection by PNP at a cost of \$9,100 is included in the scope of PNP's contract for 2018 under the capital expenditures. The net inspection was performed and documentation provided however the final payment has not been released as of September 30, 2018 and will show up on the Elkhead Operations CY 2018 invoicing.

Outlet Tower Stem Guide Anchor Bolt Replacement

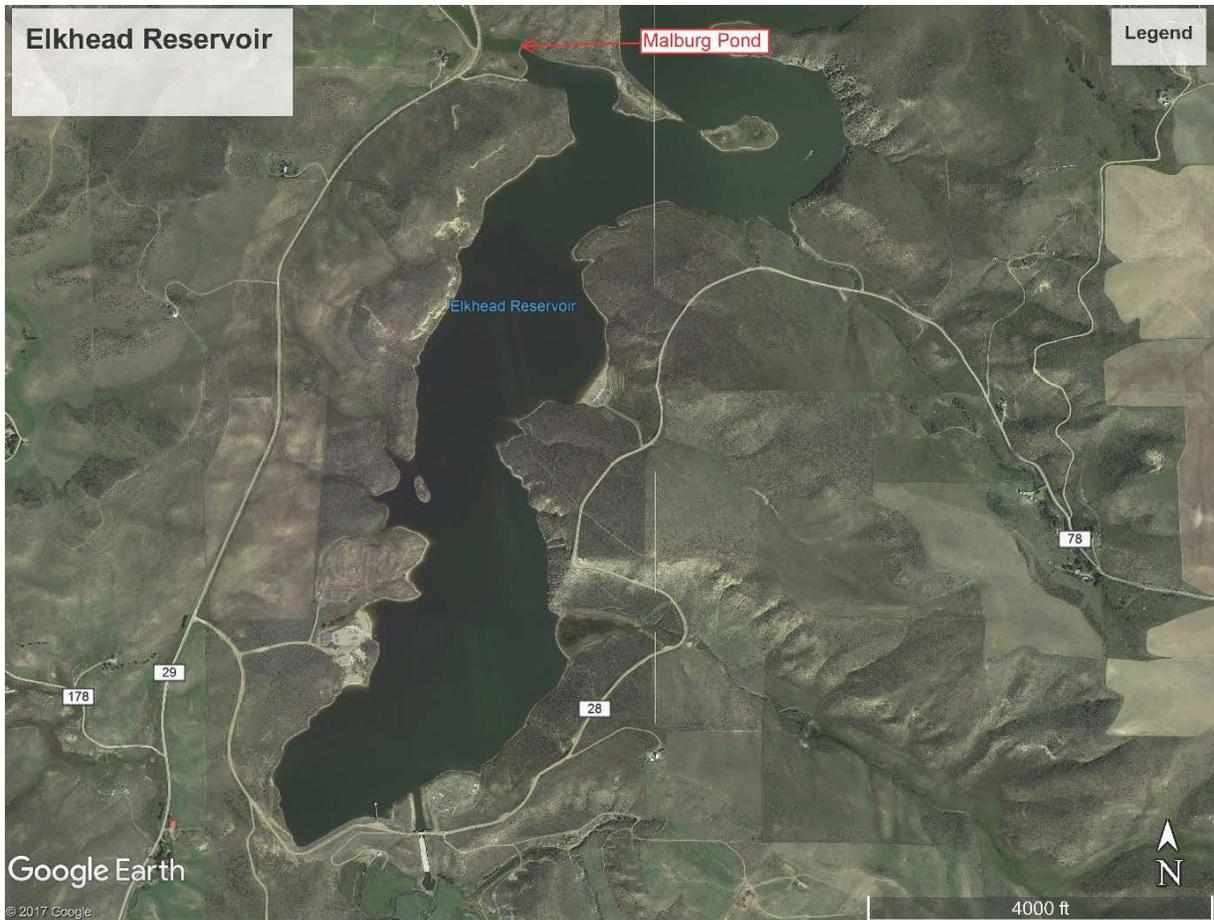
The effort to replace the substandard anchor bolts from the original construction on the movable fish screen and other gate stem guides boiled over into 2018 when the RD discovered unacceptable work on the submerged fish screen guide anchor bolts using our underwater camera rig. The contractor returned to the site and replaced all the previously installed anchor bolts at no cost to the project. Some minor RD charges related to providing full time observation of the work were realized.



Example Stem Guide Anchorage Which Was Remedied

2018 Malburg Pond Embankment Erosion Protection

The Malburg Pond is a small stock pond of less than 10 acre-feet adjacent to the reservoir. The original pond was inundated by the 2006 reservoir enlargement and as part of the acquisition of private land for the reservoir enlargement and mitigation for the inundation of the Malburg Pond the project built a replacement pond, with the Elkhead Reservoir project owners taking responsibility for maintenance of the pond embankment.



Malburg Pond Embankment Crest at Elkhead Reservoir Full Pool 2017



Malburg Pond Revetment

Spillway Concrete Repair

The concrete spillway at Elkhead Dam has some damaged concrete work at the construction joints. These have been identified in the annual dam safety inspection and were addressed this year by a recommended contractor. Billing for this work occurred after September 30, 2018 and will be included in the annual 2018 calendar year reporting and 2018 operations invoice.





Example Concrete Repair

- V. Study Schedule: Deliveries began in 2007 and will continue as requested.
- VI. Relationship to RIPRAP: Green River Action Plan: Yampa and Little Snake Rivers, I.B.2.a.(2)(b), Deliver water for endangered fish.

VII. Accomplishment of FY 2018 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings:

Reservoir operations were routine.

Discussions continue with the USACE on the adequacy of the wetland mitigation with the River District and USACE agreeing on bi-annual monitoring in odd numbered years until mitigation acreage requirements are achieved by adequate accumulation and development of sediment in the inflow area as wetlands. The 2017 wetland monitoring reporting showed a deficit of 5.7 acres project wide. As the sediment accumulates in the inflow area and becomes populated with wetland species this deficit will decline.

Malburg Pond embankment maintenance completed.

Stem guide anchor bolt remediation successfully completed and tested.

Spillway weir wall concrete repairs completed.

VIII. Additional noteworthy observations:

Colorado Parks and Wildlife doubled the camping opportunities at Elkhead Reservoir adding an additional campground. The continued investment in recreational facilities by CPW at Elkhead Reservoir will offer opportunities to create public awareness of fishery management challenges and pressure for reservoir management consideration of recreational needs.

IX. Recommendations: None

X. Project Status: On track and on-going

XI. FFY 2018 Budget Status

A. Funds Provided: \$71,342.22

B. Funds Expended: \$ 71,342.22

Note: Recovery Program 20.18% share of costs for the Malburg Pond Revetment and the Spillway Weir Concrete Repairs Recovery Program work totaling \$67,226.79 is \$13,566.36 which will appear on the CY 2018 operations invoice to the Recovery Program. While these costs were realized in FFY 2018 they were not billed to the River District in time to be included in the FFY 2018 accounting.

The 2,000 acre-foot short term water lease at \$50 per acre foot for a total of \$100,000 is not included in the above accounting and will be invoiced to the Recovery Program separately.

C. Difference: \$0

- D. Percent of the FY 2018 work completed, and projected costs to complete: 100%
- E. Recovery Program funds spent for publication charges: none

XII. Status of Data Submission (Where applicable): N/A

XIII. Signed: Ray D. Tenney Digitally signed by Ray D. Tenney
DN: cn=Ray D. Tenney, o=Colorado
River Water Conservation District,
email=rtenney@crwcd.org, c=US
Date: 2018.12.10 13:36:29 -0700
Principal Investigator Date

APPENDIX: Cost Accounting Spreadsheet for FFY 2018 – attached to email