The Southwestern Water Conservation District
The West Building, 841 E Second Avenue
Durango, CO 81301

NOTICE IS HEREBY GIVEN
A Regular Board Meeting of the
Southwestern Water Conservation District
will be held via teleconference on

Tuesday, October 13, 2020
8:30 a.m. – 11:30 a.m.

Wednesday, October 14, 2020
8:30 a.m. – 11:30 a.m.

Video: Click here to join Zoom
or
Phone Number: (346) 248 7799
Meeting ID: 852 4669 2513
Participant ID: 931249

Posted and Noticed Friday, October 9, 2020

Tentative Agenda

Please text 970-901-1388 if you have difficulty joining the meeting.

*Please raise your hand to be recognized by the chair. To raise your hand by phone, dial*9. To raise your hand by computer, please use Alt+Y (Windows) or Option+Y (Mac). To mute and unmute by phone, dial *6.*

Tuesday, October 13, 2020

1.0 Call to Order – Roll Call, Verification of Quorum (8:30 a.m.)
2.0 Review and Approve Agenda (8:33 a.m.)
3.0 Executive Session (8:35 a.m.)
- 3.1 General Manager Hiring Process – Review and Consideration of Applications
- 3.2 Southwest Colorado Wildfire Mitigation Environmental Impact Fund Authority

4.0 Report from Executive Session (10:05 a.m.)
5.0 Introductions & Zoom Instructions (10:07 a.m.)
6.0 Questions and Comments from Audience (10:10 a.m.)
7.0 Approve and/or Remove Consent Agenda Items (10:25 a.m.)
8.0 Consent Agenda (10:30 a.m.)
- 8.1 Approval of Minutes (August 4-5; September 9)
- 8.2 Acceptance of Treasurer's Report (September 2020)
- 8.3 Proposed 2021 SWCD Meeting & Holiday Schedule

9.0 Reports (10:35 a.m.)
- 9.1 Director Reports
- 9.2 Board Committee Reports
  - 9.2.1 Personnel Committee (August 27, September 3)
- 9.3 Hydrologic Conditions Update
- 9.4 Office Update
  - 9.4.1 Request that SWCD take a position on Amendment B (Gallagher Amendment Repeal and Property Tax Assessment Rates Measure)

10.0 Old Business (11:00 a.m.)
- 10.1 Proposed Changes to Employee Health Insurance and Retirement Benefits
- 10.2 General Manager Hiring Process
  - 10.2.1 Update, Proposed Revisions to Hiring Timeline, and Other Related Matters

Recess until Wednesday, October 14th at 8:30 a.m.

Wednesday, October 14, 2020

11.0 Call to Order – Roll Call, Verification of Quorum (8:30 a.m.)

12.0 Review and Approve Agenda (8:33 a.m.)

13.0 Executive Session (8:35 a.m.)
- 13.1 Montezuma Valley Irrigation Company, Case No. 18CW3052, Division 7
- 13.2 Proposed 2020-21 Winter Season Weather Modification Contracts
- 13.3 Colorado River Interstate and Intra-state matters, including re-negotiation of the interim guidelines, Lake Powell Pipeline, and exploration of demand management
- 13.4 San Miguel Water Supply Planning

14.0 Report from Executive Session (10:00 a.m.)

15.0 Introductions & Zoom Instructions (10:05 a.m.)

16.0 Questions and Comments from Audience (10:07 a.m.)

17.0 Old Business (continued) (10:10 a.m.)
- 17.1 Colorado River matters
  - 17.1.1 Colorado River Water Bank Working Group Update - Presentation of Upper Basin Demand Management Economic Study in Western Colorado
  - 17.1.2 Update on Lake Powell Pipeline
  - 17.1.3 Exploration of Demand Management
  - 17.1.4 Front Range Water Council State Line Delivery Pilot Reservoir Release
- 17.2 2021 CWCB Instream Flow Program Recommendations
- 17.3 Review of SWCD's Proposed FY2021 Budget

18.0 New Business (11:20 a.m.)
- 18.1 Proposed 2020-21 Winter Season Weather Modification Contracts

19.0 Engineering Report (11:25a.m.)
- 19.1 Upper Colorado & San Juan River Basin Recovery Implementation Programs

20.0 General Counsel Legal Report (11:28 a.m.)
- 20.1 August Water Court Resume Review (Divisions 3, 4, 7)

21.0 Executive Session (if needed)

22.0 Adjournment (11:30 a.m.)

Upcoming Meetings

December 8-9, 2020	Mornings, Exact Time TBD	Regular Board Meeting

Except the time indicated for when the meeting is scheduled to begin, the times noted for each agenda item are estimates and subject to change. The Board may address and act on agenda items in any order to accommodate the needs of the Board and the audience. Agenda items can also be added during the meeting at the consensus of the Board.

Agenda items may be placed on the Consent Agenda when the recommended action is non-controversial. The Consent Agenda may be voted on without reading or discussing individual items. Any Board member may request clarification about items on the Consent Agenda. The Board may remove items from the Consent Agenda at their discretion for further discussion.

Southwestern Water Conservation District
Budget Comparison Summary
January through September 2020

	Jan - Sep 20	Budget	$ Over Budget	% of Budget
Income				
4 · SWCD INCOME				
4.1 · Property Tax	1,571,179	1,620,102	(48,923)	97%
4.2 · Specific Ownership Tax	96,252	100,000	(3,748)	96%
4.3 · Interest, PILT & Other Taxes	37,784	35,500	2,284	106%
4.4 · Other Income				
4.4.1 · Interest Earned	46,031	40,000	6,031	115%
4.4.2 · Loan Interest	275	275	0	100%
4.4.3 · Miscellaneous Income	4,731	5,000	(269)	95%
4.4.4 · Water Seminar Registration	0	6,000	(6,000)	0%
4.4.5 · ALP/WIP Cost Sharing	70	200	(130)	35%
4.4.7 · SJRBRIP Water User Committee	50,873	50,873	0	100%
4.4.8 · Stream Gaging Reimbursement	18,613	32,481	(13,868)	57%
4.4.9 · Water Info Program	36,698	37,850	(1,152)	97%
Total 4.4 · Other Income	157,292	172,679	(15,387)	91%
Total 4 · SWCD INCOME	1,862,508	1,928,281	(65,773)	97%
Total Income	1,862,508	1,928,281	(65,773)	97%
Gross Profit	1,862,508	1,928,281	(65,773)	97%
Expense				
5 · SWCD EXPENSES				
5.01 · Water Management & Development				
5.1.1 · SWCD Grant Program	230,396	400,000	(169,604)	58%
5.1.2 · Previously Committed Grants	0	85,694	(85,694)	0%
5.1.3 · Project Reserve Fund	0	350,000	(350,000)	0%
5.1.4 · SJRBRIP Water User Committee	58,710	101,746	(43,036)	58%
5.1.5 · SWCD Project Water Rights	0	10,000	(10,000)	0%
5.1.6 · Weather Modification	28,340	117,000	(88,660)	24%
5.1.7 · Emergency Reserve Fund	0	500,000	(500,000)	0%
Total 5.01 · Water Management & Development	317,446	1,564,440	(1,246,994)	20%
5.02 · Data Collection				
5.2.1 · Center for Snow & Avalanche	7,000	7,000	0	100%
5.2.2 · Stream Gaging - Federal	26,979	108,500	(81,521)	25%
5.2.3 · Stream Gaging - Colorado	0	2,640	(2,640)	0%
5.2.4 · Water Quality Studies	9,200	13,000	(3,800)	71%
5.2.5 · SW Colorado Permanent Radar	0	10,000	(10,000)	0%
Total 5.02 · Data Collection	43,179	141,140	(97,961)	31%
5.03 · Ongoing Organizational Support				
5.3.1 · Event Sponsorships	1,000	6,000	(5,000)	17%
5.3.2 · Dues & Memberships	22,879	22,350	529	102%
5.3.3 · Bonita Peak CAG	5,000	5,000	0	100%
5.3.4 · Water Bank Working Group	11,000	17,500	(6,500)	63%
5.3.5 · Demo CSU Farm/Water Efficiency	10,000	10,000	0	100%
Total 5.03 · Ongoing Organizational Support	49,879	60,850	(10,971)	82%
5.04 · Water Education				
5.4.1 · Water Info Program	42,601	72,095	(29,494)	59%

Southwestern Water Conservation District
Budget Comparison Summary
January through September 2020

	Jan - Sep 20	Budget	$ Over Budget	% of Budget
5.4.2 · Water Seminar	880	18,000	(17,120)	5%
5.4.3 · Water Education Colorado	10,500	10,500	0	100%
5.4.4 · Water Leaders Scholarship	3,500	5,000	(1,500)	70%
5.4.5 · Children's Water Festival	758	9,500	(8,742)	8%
5.4.6 · Watershed Education Program	6,000	6,000	0	100%
Total 5.04 · Water Education	64,239	121,095	(56,856)	53%
5.05 · Technical Support				
5.5.01 · Attorney Fees - General Counsel	120,557	140,000	(19,443)	86%
5.5.02 · Travel Exps - General Counsel	1,152	15,000	(13,848)	8%
5.5.03 · Litigation - General Counsel	27,962	30,000	(2,038)	93%
5.5.04 · Co River Litigation- General Co	0	40,000	(40,000)	0%
5.5.05 · Attorney Fees - Special Counsel	28,381	10,000	18,381	284%
5.5.06 · Attorney Exps - Special Counsel	0	5,000	(5,000)	0%
5.5.07 · Lobbying Fees	49,750	50,000	(250)	100%
5.5.08 · Lobbying Expenses	708	5,500	(4,792)	13%
5.5.09 · Engineering - General	22,711	45,000	(22,289)	50%
5.5.10 · Engineering - Special Projects	0	25,000	(25,000)	0%
5.5.11 · Technical Other Expenses	13,719	50,000	(36,281)	27%
Total 5.05 · Technical Support	264,940	415,500	(150,560)	64%
5.06 · District Staff				
5.6.1 · Wages - Executive Director	71,794	146,450	(74,656)	49%
5.6.2 · Wages - Programs Coordinator	37,533	50,393	(12,860)	74%
5.6.4 · Wages - Payroll Taxes	8,778	17,716	(8,938)	50%
5.6.5 · Wages - Retirement Benefit	5,187	11,811	(6,624)	44%
5.6.6 · Wages - Health & Life Insurance	17,872	46,260	(28,388)	39%
5.6.7 · Wages - ED Bonus	0	0	0	0%
5.6.8 · Wages - Coordinator Bonus	0	0	0	0%
Total 5.06 · District Staff	141,164	272,629	(131,465)	52%
5.07 · Meetings & Travel				
5.7.1 · Director Fees	13,975	21,000	(7,025)	67%
5.7.2 · Director Travel	5,383	31,000	(25,617)	17%
5.7.3 · Registration Fees	6,293	8,500	(2,207)	74%
5.7.4 · Meeting Expenses	1,165	10,000	(8,835)	12%
5.7.5 · Staff Travel	8,150	35,000	(26,850)	23%
Total 5.07 · Meetings & Travel	34,966	105,500	(70,534)	33%
5.08 · Administration				
5.8.01 · Audit	8,200	8,400	(200)	98%
5.8.02 · Accounting	2,120	500	1,620	424%
5.8.03 · Capital Outlay	15,260	15,000	260	102%
5.8.04 · Casual Labor	0	200	(200)	0%
5.8.05 · Manager's Discretionary Budget	759	2,000	(1,241)	38%
5.8.06 · Equipment Leasing	1,350	1,800	(450)	75%
5.8.07 · Insurance - General Liability	6,734	6,000	734	112%
5.8.08 · Legal Notices	43	600	(557)	7%
5.8.09 · Miscellaneous	97	500	(403)	19%
5.8.10 · Office Expenses	3,762	7,500	(3,738)	50%
5.8.11 · Postage	1,268	1,000	268	127%
5.8.12 · Rent	24,525	30,796	(6,271)	80%
5.8.13 · Staff Training/Development	0	2,500	(2,500)	0%
5.8.14 · Telecommunication	2,371	3,500	(1,129)	68%
Total 5.08 · Administration	66,488	80,296	(13,808)	83%

Southwestern Water Conservation District
Budget Comparison Summary
January through September 2020

	Jan - Sep 20	Budget	$ Over Budget	% of Budget
5.09 · County Treasurer Fees	46,021	52,668	(6,647)	87%
5.10 · TABOR Reserve	0	84,424	(84,424)	0%
5.11 · Contingency Reserve	0	96,414	(96,414)	0%
Total 5 · SWCD EXPENSES	1,028,321	2,994,956	(1,966,635)	34%
Total Expense	1,028,321	2,994,956	(1,966,635)	34%
Net Income	**834,187**	**(1,066,675)**	**1,900,862**	**(78)%**

Southwestern Water Conservation District
Bank Account Summary
As of September 30, 2020

	Sep 30, 20
ASSETS	
Current Assets	
Checking/Savings	
100 · SWCD Checking	285,023.61
101 · SWCD Credit Card	(2,105.24)
102 · SJRBRIP Checking	63,422.57
103 · WIP Checking	131,615.77
105 · COLOTrust Project Reserve	285,309.16
106 · COLOTrust Emergency Reserve	164,990.56
107 · COLOTrust General	52,864.85
123 · CD - January 2022	1,549,809.22
159 · CD - January 2021	414,745.36
160 · CD2 - January 2021	101,778.00
166 · CD - July 2021	500,934.68
167 · CD - July 2022	501,062.21
Total Checking/Savings	4,049,450.75
Other Current Assets	
131 · Bauer Lake Loan	5,573.59
Total Other Current Assets	5,573.59
Total Current Assets	4,055,024.34
TOTAL ASSETS	**4,055,024.34**
LIABILITIES & EQUITY	0.00

Southwestern Water Conservation District

Check Detail

July through September 2020

Num	Date	Name	Memo	Account	Original Amount
Bill.com	**07/02/2020**	**Laura Spann-V**	**Mileage Dgo to Rustys (computer drop off, training)**	**100 · SWCD Checking**	**-86.25**
			Mileage Dgo to Rustys (computer drop off, training)	5.7.5 · Staff Travel	86.25
TOTAL					86.25
ACH	**07/06/2020**	**Bill.com**	**June 2020**	**100 · SWCD Checking**	**-126.97**
			June 2020	5.8.02 · Accounting	126.97
TOTAL					126.97
ACH	**07/07/2020**	**Bank of Colorado**	**June Montrose Cty Deposit, Wire Fee**	**100 · SWCD Checking**	**-5.00**
			June Montrose Cty Deposit, Wire Fee	5.8.02 · Accounting	5.00
TOTAL					5.00
Bill.com	**07/08/2020**	**Elaine Chick Consulting**	**June 2020**	**103 · WIP Checking**	**-5,875.87**
			June 2020	54111 · WIP Contract Coordination	5,875.87
TOTAL					5,875.87
Bill.com	**07/08/2020**	**Elaine Chick Consulting**	**Water Cycle Drawing Contest**	**100 · SWCD Checking**	**-28.65**
			Water Cycle Drawing Contest	5.4.5 · Children's Water Festival	28.65
TOTAL					28.65
Bill.com	**07/08/2020**	**Elaine Chick Consulting**	**June 2020 Expenses (F2F, Video)**	**103 · WIP Checking**	**-525.10**
			F2F Pagosa trip, meal, Kit supplies	54118 · WIP Sponsorships	179.52
			Mileage, meals for video shoot	54115 · WIP Mileage & Travel	335.58
			WEco Civic Engagement Webinar	54114 · WIP Conferences/Events	10.00
TOTAL					525.10
Bill.com	**07/08/2020**	**Douglas Stowe**	**Mtgs 2/26-6/3/20**	**100 · SWCD Checking**	**-900.00**
			Mtgs 2/26-6/3/20	5.7.1 · Director Fees	900.00
TOTAL					900.00
Bill.com	**07/08/2020**	**David Guilliams**	**Mtgs 2/26-6/30/20**	**100 · SWCD Checking**	**-900.00**
			Mtgs 2/26-6/30/20	5.7.1 · Director Fees	900.00
TOTAL					900.00
1099	**07/09/2020**	**Southwestern Water Conservation...**	**24-month CD investment with 1st SW Bank**	**100 · SWCD Checking**	**-500,000.00**
			24-month CD investment with 1st SW Bank	200 · Accounts Payable	500,000.00
TOTAL					500,000.00
1100	**07/09/2020**	**Southwestern Water Conservation...**	**12-month CD investment with 1st SW Bank**	**100 · SWCD Checking**	**-500,000.00**
			12-month CD investment with 1st SW Bank	200 · Accounts Payable	500,000.00
TOTAL					500,000.00
VISA	**07/09/2020**	**National Water Resources Associa...**	**2020 Table Talks Sponsorship**	**101 · SWCD Credit Card**	**-300.00**
			2020 Table Talks Sponsorship	5.3.1 · Event Sponsorships	300.00
TOTAL					300.00
Bill.com	**07/09/2020**	**Water Education Colorado**	**2020 WEco Membership**	**103 · WIP Checking**	**-250.00**
			2020 WEco Membership	54125 · WIP Memberships	250.00
TOTAL					250.00
Bill.com	**07/09/2020**	**J R Ford**	**Mtgs 4/15-6/16/20**	**100 · SWCD Checking**	**-938.00**
			Mtgs 4/15-6/16/20	5.7.1 · Director Fees	900.00
			Mtgs in Durango May-June 2020	5.7.2 · Director Travel	38.00
TOTAL					938.00

Southwestern Water Conservation District

Check Detail

July through September 2020

Num	Date	Name	Memo	Account	Original Amount
Bill.com	**07/09/2020**	**Russell Hinger**	**Mtgs 3/11-6/30/20**	**100 · SWCD Checking**	**-700.00**
			Mtgs 3/11-6/30/20	5.7.1 · Director Fees	700.00
TOTAL					700.00
VISA	**07/09/2020**	**ImageNet**	**July 2020**	**101 · SWCD Credit Card**	**-150.00**
			July 2020	5.8.06 · Equipment Leasing	150.00
TOTAL					150.00
VISA	**07/09/2020**	**US Postal Service**	**Mail SWCD Diagram to Strategic Planning Committee**	**101 · SWCD Credit Card**	**-13.95**
			Mail SWCD Diagram to Strategic Planning Committee	5.8.11 · Postage	13.95
TOTAL					13.95
ACH	**07/14/2020**	**United States Treasury**	**June 2020**	**100 · SWCD Checking**	**-4,563.30**
			June 2020	215 · FICA/Medicare/Fed W/H	2,075.00
			June 2020	215 · FICA/Medicare/Fed W/H	1,008.33
			June 2020	215 · FICA/Medicare/Fed W/H	1,008.33
			June 2020	215 · FICA/Medicare/Fed W/H	235.82
			June 2020	215 · FICA/Medicare/Fed W/H	235.82
TOTAL					4,563.30
VISA	**07/14/2020**	**Mail Room and Copy Center**	**Mail SWCD Diagram to JR and David**	**101 · SWCD Credit Card**	**-19.73**
			Mail SWCD Diagram to JR and David	5.8.11 · Postage	19.73
TOTAL					19.73
VISA	**07/14/2020**	**Flower Power Wash Park**	**Beth Birthday Flowers**	**101 · SWCD Credit Card**	**-96.65**
			Beth Birthday Flowers	5.8.09 · Miscellaneous	96.65
TOTAL					96.65
Bill.com	**07/15/2020**	**Don Schwindt**	**Mtgs 6/11-30/20**	**100 · SWCD Checking**	**-469.00**
			Mtgs 6/11-30/20	5.7.1 · Director Fees	400.00
			Mtgs 6/16/20	5.7.2 · Director Travel	69.00
TOTAL					469.00
Bill.com	**07/15/2020**	**Robinson, Waters & O'Dorisio**	**June 2020**	**100 · SWCD Checking**	**-5,610.00**
			June 2020	5.5.05 · Attorney Fees - Special Counsel	5,610.00
TOTAL					5,610.00
Bill.com	**07/15/2020**	**Van Vurst Law**	**June 2020**	**100 · SWCD Checking**	**-21,098.00**
			June 2020	5.5.01 · Attorney Fees - General Counsel	19,866.00
			June 2020	5.5.03 · Litigation - General Counsel	1,232.00
TOTAL					21,098.00
ACH	**07/15/2020**	**Laura E Spann**	**6/29-7/12/20**	**100 · SWCD Checking**	**-1,405.56**
			6/29-7/12/20	5.6.2 · Wages - Programs Coordinator	1,950.52
			6/29-7/12/20	5.6.6 · Wages - Health & Life Insurance	-143.74
			6/29-7/12/20	215 · FICA/Medicare/Fed W/H	-169.00
			6/29-7/12/20	5.6.4 · Wages - Payroll Taxes	120.93
			6/29-7/12/20	215 · FICA/Medicare/Fed W/H	-120.93
			6/29-7/12/20	215 · FICA/Medicare/Fed W/H	-120.93
			6/29-7/12/20	5.6.4 · Wages - Payroll Taxes	28.29
			6/29-7/12/20	215 · FICA/Medicare/Fed W/H	-28.29
			6/29-7/12/20	215 · FICA/Medicare/Fed W/H	-28.29
			6/29-7/12/20	216 · State W/H Tax Payable	-83.00
TOTAL					1,405.56
Bill.com	**07/15/2020**	**Colorado Employer Benefit Trust**	**August 2020**	**100 · SWCD Checking**	**-1,560.17**
			August 2020	5.6.6 · Wages - Health & Life Insurance	1,560.17
TOTAL					1,560.17

Southwestern Water Conservation District

Check Detail

July through September 2020

Num	Date	Name	Memo	Account	Original Amount
Bill.com	**07/15/2020**	**Harris Water Engineering, Inc**	**April-June 2020**	**100 · SWCD Checking**	**-6,457.50**
			April-June 2020	5.5.09 · Engineering - General	6,457.50
TOTAL					6,457.50
Pay.gov	**07/20/2020**	**US Geological Survey**	**2Q2020**	**100 · SWCD Checking**	**-2,063.00**
			2Q2020	5.2.2 · Stream Gaging - Federal	2,063.00
TOTAL					2,063.00
Bill.com	**07/21/2020**	**Colorado River WCD**	**Feb-June 2020 Costshare for Co River Modeling**	**100 · SWCD Checking**	**-10,290.75**
			Feb-June 2020 Costshare for Co River Modeling	5.5.11 · Technical Other Expenses	10,290.75
TOTAL					10,290.75
Bill.com	**07/21/2020**	**Robert Wolff**	**Mtgs 6/23-7/21/20**	**100 · SWCD Checking**	**-720.70**
			Mtgs 6/23-7/21/20	5.7.1 · Director Fees	700.00
			Mtgs 6/23-7/21/20	5.7.2 · Director Travel	20.70
TOTAL					720.70
Bill.com	**07/21/2020**	**Mountain Studies Institute**	**2020 Grant: Environmental Impact Fund**	**100 · SWCD Checking**	**-49,998.00**
			2020 Grant: Environmental Impact Fund	5.1.1 · SWCD Grant Program	49,998.00
TOTAL					49,998.00
Bill.com	**07/22/2020**	**Vallecito Conservation & Sporting ...**	**2020 Pine River Watershed Group WQ Monitoring**	**100 · SWCD Checking**	**-2,200.00**
			2020 Pine River Watershed Group WQ Monitoring	5.2.4 · Water Quality Studies	2,200.00
TOTAL					2,200.00
VISA	**07/24/2020**	**SW Pro Audio**	**Conf Room A/V Upgrade**	**101 · SWCD Credit Card**	**-300.00**
			Conf Room A/V Upgrade	5.8.03 · Capital Outlay	300.00
TOTAL					300.00
VISA	**07/26/2020**	**Verizon**	**May-June 2020**	**101 · SWCD Credit Card**	**-314.33**
			May-June 2020	5.8.14 · Telecommunication	314.33
TOTAL					314.33
ACH	**07/27/2020**	**Laura E Spann**	**07/13-26/20**	**100 · SWCD Checking**	**-1,395.38**
			07/13-26/20	5.6.2 · Wages - Programs Coordinator	1,938.40
			07/13-26/20	5.6.6 · Wages - Health & Life Insurance	-143.74
			07/13-26/20	215 · FICA/Medicare/Fed W/H	-168.00
			07/13-26/20	5.6.4 · Wages - Payroll Taxes	120.18
			07/13-26/20	215 · FICA/Medicare/Fed W/H	-120.18
			07/13-26/20	215 · FICA/Medicare/Fed W/H	-120.18
			07/13-26/20	5.6.4 · Wages - Payroll Taxes	28.10
			07/13-26/20	215 · FICA/Medicare/Fed W/H	-28.10
			07/13-26/20	215 · FICA/Medicare/Fed W/H	-28.10
			07/13-26/20	216 · State W/H Tax Payable	-83.00
TOTAL					1,395.38
VISA	**07/29/2020**	**US Postal Service**	**Bd Packet Mailing for August**	**101 · SWCD Credit Card**	**-158.10**
			Bd Packet Mailing for August	5.8.11 · Postage	158.10
TOTAL					158.10
VISA	**07/29/2020**	**Mail Room and Copy Center**	**SWCD Diagram Mailing 7-29-20**	**101 · SWCD Credit Card**	**-145.12**
			SWCD Diagram Mailing 7-29-20	5.8.11 · Postage	145.12
TOTAL					145.12
VISA	**07/29/2020**	**Mail Room and Copy Center**	**Tubes for SWCD Diagram Mailing**	**101 · SWCD Credit Card**	**-27.75**
			Tubes for SWCD Diagram Mailing	5.8.10 · Office Expenses	27.75
TOTAL					27.75

Southwestern Water Conservation District

Check Detail

July through September 2020

Num	Date	Name	Memo	Account	Original Amount
VISA	**07/29/2020**	**Basin Printing**	**Print 24"x36" Diagram**	**101 · SWCD Credit Card**	**-84.00**
			Print 24"x36" Diagram	5.8.10 · Office Expenses	84.00
TOTAL					84.00
ACH	**07/30/2020**	**Colorado Department of Revenue**	**2Q2020**	**100 · SWCD Checking**	**-2,082.00**
			2Q2020	216 · State W/H Tax Payable	2,082.00
TOTAL					2,082.00
ACH	**07/30/2020**	**Colorado State Treasurer**	**2Q2020**	**100 · SWCD Checking**	**-155.70**
			2Q2020	217 · State Unemployment Tax	155.70
TOTAL					155.70
Bill.com	**07/31/2020**	**The West Building**	**August 2020**	**100 · SWCD Checking**	**-2,434.50**
			August 2020	5.8.12 · Rent	2,434.50
TOTAL					2,434.50
Bill.com	**07/31/2020**	**Snyder Ditch Company**	**2020 Grant to FS Mockler Ditch**	**100 · SWCD Checking**	**-75,000.00**
			2020 Grant to FS Mockler Ditch	5.1.1 · SWCD Grant Program	75,000.00
TOTAL					75,000.00
Bill.com	**08/05/2020**	**Dolores Water Conservancy District**	**WY19-20 Final Invoice, All Programs**	**100 · SWCD Checking**	**-11,020.00**
			WY19-20 Final Invoice, All Programs	5.1.6 · Weather Modification	11,020.00
TOTAL					11,020.00
VISA	**08/05/2020**	**Charter Spectrum**	**July 2020**	**101 · SWCD Credit Card**	**-69.99**
			July 2020	5.8.14 · Telecommunication	69.99
TOTAL					69.99
ACH	**08/05/2020**	**Bank of Colorado**	**Montrose Cty Deposit Wire Fee July 2020**	**100 · SWCD Checking**	**-5.00**
			Montrose Cty Deposit Wire Fee July 2020	5.8.02 · Accounting	5.00
TOTAL					5.00
Bill.com	**08/07/2020**	**Elaine Chick Consulting**	**July 2020 Program Contract**	**103 · WIP Checking**	**-4,120.47**
			July 2020 Program Contract	54111 · WIP Contract Coordination	4,120.47
TOTAL					4,120.47
Bill.com	**08/07/2020**	**Elaine Chick Consulting**	**F2F Supplies**	**103 · WIP Checking**	**-111.61**
			F2F Supplies	54118 · WIP Sponsorships	111.61
TOTAL					111.61
Bill.com	**08/07/2020**	**Robert Wolff**	**Mtgs 7/22-8/5/20**	**100 · SWCD Checking**	**-770.19**
			Mtgs 7/22-8/5/20	5.7.1 · Director Fees	700.00
			FedEx Personnel File to Beth	5.8.11 · Postage	37.67
			Masks for Office	5.8.10 · Office Expenses	32.52
TOTAL					770.19
VISA	**08/07/2020**	**Basin Printing**	**SWCD Logo Stickers**	**101 · SWCD Credit Card**	**-814.00**
			SWCD Logo Stickers	5.4.2 · Water Seminar	814.00
TOTAL					814.00
Bill.com	**08/07/2020**	**J R Ford**	**Bd Mtg 8/4-5/20**	**100 · SWCD Checking**	**-200.00**
			Bd Mtg 8/4-5/20	5.7.1 · Director Fees	200.00
TOTAL					200.00

Southwestern Water Conservation District

Check Detail

July through September 2020

Num	Date	Name	Memo	Account	Original Amount
VISA	**08/07/2020**	**US Postal Service**	**Mail Demand Management Update**	**101 · SWCD Credit Card**	**-54.90**
			Mail Demand Management Update	5.8.11 · Postage	54.90
TOTAL					54.90
ACH	**08/07/2020**	**Bill.com**	**July 2020**	**100 · SWCD Checking**	**-135.47**
			July 2020	5.8.02 · Accounting	135.47
TOTAL					135.47
Bill.com	**08/07/2020**	**Blue Channel**	**WIP website support**	**103 · WIP Checking**	**-120.01**
			WIP website suppport	54112 · WIP Website/Tech Support	120.01
TOTAL					120.01
VISA	**08/07/2020**	**ImageNet**	**August 2020**	**101 · SWCD Credit Card**	**-150.00**
			August 2020	5.8.06 · Equipment Leasing	150.00
TOTAL					150.00
Bill.com	**08/07/2020**	**Van Vurst Law**	**July 2020**	**100 · SWCD Checking**	**-18,370.00**
			July 2020	5.5.01 · Attorney Fees - General Counsel	15,620.00
			July 2020	5.5.03 · Litigation - General Counsel	2,750.00
TOTAL					18,370.00
ACH	**08/09/2020**	**Laura E Spann**	**07/27-08/09/20**	**100 · SWCD Checking**	**-1,395.37**
			07/27-08/09/20	5.6.2 · Wages - Programs Coordinator	1,938.40
			07/27-08/09/20	5.6.6 · Wages - Health & Life Insurance	-143.74
			07/27-08/09/20	215 · FICA/Medicare/Fed W/H	-168.00
			07/27-08/09/20	5.6.4 · Wages - Payroll Taxes	120.18
			07/27-08/09/20	215 · FICA/Medicare/Fed W/H	-120.18
			07/27-08/09/20	215 · FICA/Medicare/Fed W/H	-120.18
			07/27-08/09/20	5.6.4 · Wages - Payroll Taxes	28.11
			07/27-08/09/20	215 · FICA/Medicare/Fed W/H	-28.11
			07/27-08/09/20	215 · FICA/Medicare/Fed W/H	-28.11
			07/27-08/09/20	216 · State W/H Tax Payable	-83.00
TOTAL					1,395.37
Bill.com	**08/10/2020**	**Robinson, Waters & O'Dorisio**	**June 20-July 20, 2020**	**100 · SWCD Checking**	**-3,780.00**
			June 20-July 20, 2020	5.5.05 · Attorney Fees - Special Counsel	3,780.00
TOTAL					3,780.00
Bill.com	**08/10/2020**	**CSU /SW Colorado Research Center**	**2020 Research Support**	**100 · SWCD Checking**	**-10,000.00**
			2020 Research Support	5.3.5 · Demo CSU Farm/Water Efficiency	10,000.00
TOTAL					10,000.00
VISA	**08/10/2020**	**Brown & Caldwell**	**GM Job Posting**	**101 · SWCD Credit Card**	**-200.00**
			GM Job Posting	5.8.10 · Office Expenses	200.00
TOTAL					200.00
VISA	**08/10/2020**	**Indeed**	**GM job posting advertising**	**101 · SWCD Credit Card**	**-26.03**
			GM job posting advertising	5.8.10 · Office Expenses	26.03
TOTAL					26.03
Bill.com	**08/12/2020**	**Four Corners Farmers & Ranchers...**	**2020 Local NYFC Chapter Membership**	**100 · SWCD Checking**	**-500.00**
			2020 Local NYFC Chapter Membership	5.3.2 · Dues & Memberships	500.00
TOTAL					500.00
Bill.com	**08/12/2020**	**Colorado Employer Benefit Trust**	**September 2020**	**100 · SWCD Checking**	**-1,560.17**
			September 2020	5.6.6 · Wages - Health & Life Insurance	1,560.17
TOTAL					1,560.17

Southwestern Water Conservation District

Check Detail

July through September 2020

Num	Date	Name	Memo	Account	Original Amount
Bill.com	**08/12/2020**	**Fort Lewis College**	**2020 Campus Water Action Plan Grant**	**100 · SWCD Checking**	**-722.56**
			2020 Campus Water Action Plan Grant	5.1.1 · SWCD Grant Program	722.56
TOTAL					722.56
Bill.com	**08/12/2020**	**Mountain Studies Institute**	**WIP partnership in F2F teacher training**	**103 · WIP Checking**	**-1,208.94**
			WIP partnership in F2F teacher training	54118 · WIP Sponsorships	1,208.94
TOTAL					1,208.94
ACH	**08/14/2020**	**United States Treasury**	**July 2020**	**100 · SWCD Checking**	**-932.00**
			July 2020	215 · FICA/Medicare/Fed W/H	337.00
			July 2020	215 · FICA/Medicare/Fed W/H	241.11
			July 2020	215 · FICA/Medicare/Fed W/H	241.11
			July 2020	215 · FICA/Medicare/Fed W/H	56.39
			July 2020	215 · FICA/Medicare/Fed W/H	56.39
TOTAL					932.00
Bill.com	**08/14/2020**	**Mancos Conservation District**	**2020 SMP Grant, 1st Payment**	**100 · SWCD Checking**	**-7,437.41**
			2020 SMP Grant, 1st Payment	5.1.1 · SWCD Grant Program	7,437.41
TOTAL					7,437.41
VISA	**08/16/2020**	**Mountain Studies Institute**	**Mining & Reclamation Conf - Charlie Smith**	**101 · SWCD Credit Card**	**-55.00**
			Mining & Reclamation Conf - Charlie Smith	5.7.3 · Registration Fees	55.00
TOTAL					55.00
Bill.com	**08/17/2020**	**Water Consult**	**April 4-July 31, 2020**	**102 · SJRBRIP Checking**	**-17,035.50**
			April 4-July 31, 2020	5.1.4 · SJRBRIP Water User Committee	17,035.50
TOTAL					17,035.50
Bill.com	**08/18/2020**	**Colorado Water Congress**	**WOTUS Amicus Brief**	**100 · SWCD Checking**	**-1,000.00**
			WOTUS Amicus Brief	5.3.2 · Dues & Memberships	1,000.00
TOTAL					1,000.00
Bill.com	**08/18/2020**	**Colorado Water Congress**	**Summer Conference Addt'l Sponsorship**	**100 · SWCD Checking**	**-500.00**
			Summer Conference Addt'l Sponsorship	5.3.2 · Dues & Memberships	500.00
TOTAL					500.00
Bill.com	**08/18/2020**	**Don Schwindt**	**Mtgs 7/15-8/6/20**	**100 · SWCD Checking**	**-400.00**
			Mtgs 7/15-8/6/20	5.7.1 · Director Fees	400.00
TOTAL					400.00
Bill.com	**08/21/2020**	**Elaine Chick Consulting**	**F2F meals, Travel, Registration**	**103 · WIP Checking**	**-489.67**
			F2F meals	54118 · WIP Sponsorships	157.47
			F2F mileage and meals	54115 · WIP Mileage & Travel	165.20
			Water Ed Symposium, Project Wet	54114 · WIP Conferences/Events	167.00
TOTAL					489.67
VISA	**08/21/2020**	**Colorado Water Congress**	**Summer Conf Schwindt, Spann**	**101 · SWCD Credit Card**	**-750.00**
			Summer Conf Schwindt, Spann	5.7.3 · Registration Fees	750.00
TOTAL					750.00

Southwestern Water Conservation District

Check Detail

July through September 2020

Num	Date	Name	Memo	Account	Original Amount
ACH	**08/23/2020**	**Laura E Spann**	**08/10-23/20**	**100 · SWCD Checking**	**-1,395.37**
			08/10-23/20	5.6.2 · Wages - Programs Coordinator	1,938.40
			08/10-23/20	5.6.6 · Wages - Health & Life Insurance	-143.74
			08/10-23/20	215 · FICA/Medicare/Fed W/H	-168.00
			08/10-23/20	5.6.4 · Wages - Payroll Taxes	120.18
			08/10-23/20	215 · FICA/Medicare/Fed W/H	-120.18
			08/10-23/20	215 · FICA/Medicare/Fed W/H	-120.18
			08/10-23/20	5.6.4 · Wages - Payroll Taxes	28.11
			08/10-23/20	215 · FICA/Medicare/Fed W/H	-28.11
			08/10-23/20	215 · FICA/Medicare/Fed W/H	-28.11
			08/10-23/20	216 · State W/H Tax Payable	-83.00
TOTAL					1,395.37
Bill.com	**08/24/2020**	**Fredrick Zink & Associates**	**July 2020 Review**	**100 · SWCD Checking**	**-337.75**
			July 2020 Review	5.8.02 · Accounting	337.75
TOTAL					337.75
Bill.com	**08/24/2020**	**Haynie & Company**	**2019 Audit**	**100 · SWCD Checking**	**-8,200.00**
			2019 Audit	5.8.01 · Audit	8,200.00
TOTAL					8,200.00
Bill.com	**08/27/2020**	**SW Water Conservation District**	**Jan - July 2020 Office Expenses**	**103 · WIP Checking**	**-69.95**
			Jan-July 2020 Copies	54124 · WIP Office Expenses	10.46
			F2F Program Copies	54118 · WIP Sponsorships	59.49
TOTAL					69.95
Bill.com	**08/27/2020**	**The West Building**	**Sept 2020**	**100 · SWCD Checking**	**-2,471.94**
			Sept 2020	5.8.12 · Rent	2,471.94
TOTAL					2,471.94
VISA	**08/29/2020**	**Verizon**	**July 2020**	**101 · SWCD Credit Card**	**-160.93**
			July 2020	5.8.14 · Telecommunication	160.93
TOTAL					160.93
Bill.com	**08/31/2020**	**Water Information Program**	**2020 Matching Contribution**	**100 · SWCD Checking**	**-36,050.00**
			2020 Matching Contribution	4.4.9.2 · WIP SWCD Matching Contrib...	36,050.00
TOTAL					36,050.00
Bill.com	**09/01/2020**	**Blue Channel**	**2020 swwcd.org domain name**	**100 · SWCD Checking**	**-25.00**
			2020 swwcd.org domain name	5.8.10 · Office Expenses	25.00
TOTAL					25.00
VISA	**09/01/2020**	**Indeed**	**Continued advertising, GM job posting**	**101 · SWCD Credit Card**	**-173.97**
			Continued advertising, GM job posting	5.8.10 · Office Expenses	173.97
TOTAL					173.97
Bill.com	**09/02/2020**	**Moxiecran Media LLC**	**June-Aug 2020 Pre-production**	**103 · WIP Checking**	**-2,000.00**
			June-Aug 2020 Pre-production	54119 · WIP Educational Products	2,000.00
TOTAL					2,000.00
Bill.com	**09/02/2020**	**Water Education Colorado**	**Citizens Guides Refill**	**103 · WIP Checking**	**-897.00**
			Citizens Guides Refill	54119 · WIP Educational Products	897.00
TOTAL					897.00
Bill.com	**09/02/2020**	**Five Rivers Trout Unlimited**	**2020 Grant: Upper San Juan SMP Phase II**	**100 · SWCD Checking**	**-17,158.00**
			2020 Grant: Upper San Juan SMP Phase II	5.1.1 · SWCD Grant Program	17,158.00
TOTAL					17,158.00

Southwestern Water Conservation District

Check Detail

July through September 2020

Num	Date	Name	Memo	Account	Original Amount
Bill.com	**09/02/2020**	**Elaine Chick Consulting**	**August 2020 Contract Coordination**	**103 · WIP Checking**	**-4,120.47**
			August 2020	54111 · WIP Contract Coordination	4,120.47
TOTAL					4,120.47
Bill.com	**09/02/2020**	**Robert Wolff**	**Mtgs 8/5-31/20**	**100 · SWCD Checking**	**-600.00**
			Mtgs 8/5-31/20	5.7.1 · Director Fees	600.00
TOTAL					600.00
Bill.com	**09/03/2020**	**Charles Smith**	**Mtgs 03/12-09/3/2020**	**100 · SWCD Checking**	**-625.00**
			Mtgs 03/12-09/3/2020	5.7.2 · Director Travel	625.00
TOTAL					625.00
VISA	**09/04/2020**	**Charter Spectrum**	**August 2020**	**101 · SWCD Credit Card**	**-69.99**
			August 2020	5.8.14 · Telecommunication	69.99
TOTAL					69.99
ACH	**09/06/2020**	**Laura E Spann**	**08/24-9/6/2020**	**100 · SWCD Checking**	**-1,299.08**
			08/24-9/6/2020	5.6.2 · Wages - Programs Coordinator	1,938.40
			08/24-9/6/2020	5.6.6 · Wages - Health & Life Insurance	-143.74
			08/24-9/6/2020	221 · 457 Withholding	-116.30
			08/24-9/6/2020	215 · FICA/Medicare/Fed W/H	-154.00
			08/24-9/6/2020	5.6.4 · Wages - Payroll Taxes	120.18
			08/24-9/6/2020	215 · FICA/Medicare/Fed W/H	-120.18
			08/24-9/6/2020	215 · FICA/Medicare/Fed W/H	-120.18
			08/24-9/6/2020	5.6.4 · Wages - Payroll Taxes	28.10
			08/24-9/6/2020	215 · FICA/Medicare/Fed W/H	-28.10
			08/24-9/6/2020	215 · FICA/Medicare/Fed W/H	-28.10
			08/24-9/6/2020	216 · State W/H Tax Payable	-77.00
TOTAL					1,299.08
ACH	**09/08/2020**	**Lincoln Financial Group**	**8/24-9/6/20**	**100 · SWCD Checking**	**-232.60**
			8/24-9/6/20	221 · 457 Withholding	116.30
			8/24-9/6/20	5.6.5 · Wages - Retirement Benefit	116.30
TOTAL					232.60
Bill.com	**09/08/2020**	**Van Vurst Law**	**August 2020**	**100 · SWCD Checking**	**-21,318.00**
			August 2020	5.5.01 · Attorney Fees - General Counsel	10,956.00
			August 2020	5.5.03 · Litigation - General Counsel	10,362.00
TOTAL					21,318.00
VISA	**09/08/2020**	**US Postal Service**	**Bd Packet Mailing 09-09-2020**	**101 · SWCD Credit Card**	**-128.65**
			Bd Packet Mailing 09-09-2020	5.8.11 · Postage	128.65
TOTAL					128.65
Bill.com	**09/08/2020**	**Colorado Employer Benefit Trust**	**October 2020**	**100 · SWCD Checking**	**-1,560.17**
			October 2020	5.6.6 · Wages - Health & Life Insurance	1,560.17
TOTAL					1,560.17
ACH	**09/08/2020**	**Bank of Colorado**	**Sept 2020 Montrose Cty Deposit**	**100 · SWCD Checking**	**-5.00**
			Sept 2020 Montrose Cty Deposit	5.8.02 · Accounting	5.00
TOTAL					5.00
VISA	**09/09/2020**	**ImageNet**	**September 2020**	**101 · SWCD Credit Card**	**-150.00**
			September 2020	5.8.06 · Equipment Leasing	150.00
TOTAL					150.00

Southwestern Water Conservation District

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Num	Date	Name	Memo	Account	Original Amount
Bill.com	**09/09/2020**	**Bill.com**	**August 2020**	**100 · SWCD Checking**	**-149.55**
			August 2020	5.8.02 · Accounting	149.55
TOTAL					149.55
ACH	**09/14/2020**	**United States Treasury**	**August 2020**	**100 · SWCD Checking**	**-929.16**
			August 2020	215 · FICA/Medicare/Fed W/H	336.00
			August 2020	215 · FICA/Medicare/Fed W/H	240.36
			August 2020	215 · FICA/Medicare/Fed W/H	240.36
			August 2020	215 · FICA/Medicare/Fed W/H	56.22
			August 2020	215 · FICA/Medicare/Fed W/H	56.22
TOTAL					929.16
VISA	**09/14/2020**	**Colorado Special Districts Assoc**	**2020 SDA Conference Registration - Spann**	**101 · SWCD Credit Card**	**-100.00**
			2020 SDA Conference Registration - Spann	5.7.3 · Registration Fees	100.00
TOTAL					100.00
Pay.gov	**09/15/2020**	**US Geological Survey**	**3Q2020**	**101 · SWCD Credit Card**	**-663.00**
			3Q2020	5.2.2 · Stream Gaging - Federal	663.00
TOTAL					663.00
VISA	**09/15/2020**	**Durango Herald**	**Herald, Journal BRT Election Notice**	**101 · SWCD Credit Card**	**-31.64**
			Herald, Journal BRT Election Notice	5.8.08 · Legal Notices	31.64
TOTAL					31.64
VISA	**09/16/2020**	**Fredrick Zink & Associates**	**August 2020**	**101 · SWCD Credit Card**	**-192.50**
			August 2020	5.8.02 · Accounting	192.50
TOTAL					192.50
VISA	**09/16/2020**	**Telluride Newspapers Inc**	**BRT Election Notice**	**101 · SWCD Credit Card**	**-11.85**
			BRT Election Notice	5.8.08 · Legal Notices	11.85
TOTAL					11.85
Bill.com	**09/16/2020**	**Ruben Guadiana**	**Repair copier scanner**	**100 · SWCD Checking**	**-250.00**
			Repair copier scanner	5.8.10 · Office Expenses	250.00
TOTAL					250.00
Bill.com	**09/17/2020**	**Christopher Treese**	**August 2020**	**100 · SWCD Checking**	**-2,850.00**
			August 2020	5.5.11 · Technical Other Expenses	2,850.00
TOTAL					2,850.00
Bill.com	**09/17/2020**	**Water Information Program**	**2020 SWCD Matching #2**	**100 · SWCD Checking**	**-350.00**
			2020 SWCD Matching #2	4.4.9.2 · WIP SWCD Matching Contrib...	350.00
TOTAL					350.00
VISA	**09/18/2020**	**US Postal Service**	**Mail 2000 Budget and Report to Beth**	**101 · SWCD Credit Card**	**-5.40**
			Mail 2000 Budget and Report to Beth	5.8.11 · Postage	5.40
TOTAL					5.40
Bill.com	**09/18/2020**	**HabiTech, Inc**	**June 2020-September 24, 2020**	**102 · SJRBRIP Checking**	**-7,705.00**
			June 2020-September 24, 2020	5.1.4 · SJRBRIP Water User Committee	7,705.00
TOTAL					7,705.00

Southwestern Water Conservation District

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July through September 2020

Num	Date	Name	Memo	Account	Original Amount
ACH	**09/21/2020**	**Laura E Spann**	**09/7-20/2020**	**100 · SWCD Checking**	**-1,299.07**
			09/7-20/2020	5.6.2 · Wages - Programs Coordinator	1,938.40
			09/7-20/2020	5.6.6 · Wages - Health & Life Insurance	-143.74
			09/7-20/2020	221 · 457 Withholding	-116.30
			09/7-20/2020	215 · FICA/Medicare/Fed W/H	-154.00
			09/7-20/2020	5.6.4 · Wages - Payroll Taxes	120.18
			09/7-20/2020	215 · FICA/Medicare/Fed W/H	-120.18
			09/7-20/2020	215 · FICA/Medicare/Fed W/H	-120.18
			09/7-20/2020	5.6.4 · Wages - Payroll Taxes	28.11
			09/7-20/2020	215 · FICA/Medicare/Fed W/H	-28.11
			09/7-20/2020	215 · FICA/Medicare/Fed W/H	-28.11
			09/7-20/2020	216 · State W/H Tax Payable	-77.00
TOTAL					1,299.07
VISA	**09/21/2020**	**Kroegers**	**Copy GM Office Key**	**101 · SWCD Credit Card**	**-7.13**
			Copy GM Office Key	5.8.10 · Office Expenses	7.13
TOTAL					7.13
ACH	**09/21/2020**	**Lincoln Financial Group**	**09/7-20/2020**	**100 · SWCD Checking**	**-232.60**
			09/7-20/2020	221 · 457 Withholding	116.30
			09/7-20/2020	5.6.5 · Wages - Retirement Benefit	116.30
TOTAL					232.60
Bill.com	**09/22/2020**	**Robinson, Waters & O'Dorisio**	**August 2020**	**100 · SWCD Checking**	**-3,090.00**
			August 2020	5.5.05 · Attorney Fees - Special Counsel	3,090.00
TOTAL					3,090.00
VISA	**09/23/2020**	**ImageNet**	**4Q2020 Base**	**101 · SWCD Credit Card**	**-412.15**
			4Q2020 Base	5.8.10 · Office Expenses	412.15
TOTAL					412.15
Bill.com	**09/23/2020**	**Monte Naslund**	**Mtgs 1/28-9/9/20; Mail Binders to SWCD**	**100 · SWCD Checking**	**-348.39**
			Mtgs 1/28-9/9/20; Mail Binders to SWCD	5.7.1 · Director Fees	325.00
			Mail binders to SWCD	5.8.11 · Postage	23.39
TOTAL					348.39
Bill.com	**09/23/2020**	**Wright Water Engineers**	**July 2020**	**100 · SWCD Checking**	**-578.00**
			July 2020	5.5.10 · Engineering - Special Projects	578.00
TOTAL					578.00
Bill.com	**09/24/2020**	**Trout Raley**	**August 2020**	**100 · SWCD Checking**	**-1,663.80**
			August 2020	5.5.05 · Attorney Fees - Special Counsel	1,663.80
TOTAL					1,663.80
VISA	**09/26/2020**	**Verizon**	**August 2020**	**101 · SWCD Credit Card**	**-158.96**
			August 2020	5.8.14 · Telecommunication	158.96
TOTAL					158.96
Bill.com	**09/26/2020**	**The West Building**	**Oct 2020**	**100 · SWCD Checking**	**-2,484.06**
			Oct 2020	5.8.12 · Rent	2,484.06
TOTAL					2,484.06
Bill.com	**09/29/2020**	**Kogovsek & Associates, Inc.**	**4Q2020**	**100 · SWCD Checking**	**-12,500.00**
			4Q2020	5.5.07 · Lobbying Fees	12,500.00
TOTAL					12,500.00

2021

SWCD BOARD MEETING SCHEDULE

JANUARY

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

FEBRUARY

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	1	2	3	4	5	6
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14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

MARCH

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21	22	23	24	25	26	27
28	29	30	31			

APRIL

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18	19	20	21	22	23	24
25	26	27	28	29	30	

MAY

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23	24	25	26	27	28	29
30	31					

JUNE

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20	21	22	23	24	25	26
27	28	29	30			

JULY

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11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

OCTOBER

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

NOVEMBER

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

DECEMBER

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Holiday Closure | Regular Board Meeting | Other Meetings

DRAFT 9-10-20

FRI, JAN 1: NEW YEARS DAY

MON, JAN 18: MLK DAY

TUES, JAN 19: BOARD TELECONFERENCE

WED, FEB 3: BOARD TELECONFERENCE

FEB 10-11: REGULAR BOARD MEETING (GRANTS)

MON, FEB 15: PRESIDENTS DAY

WED, FEB 24: BOARD TELECONFERENCE

WED, MARCH 10: BOARD TELECONFERENCE

WED, MARCH 24: BOARD TELECONFERENCE

THURS, APRIL 1: REGULAR BOARD MEETING

FRI, APRIL 2: ANNUAL WATER SEMINAR

WED, APRIL 14: BOARD TELECONFERENCE

WED, APRIL 28: BOARD TELECONFERENCE

WED, MAY 5: CHILDREN'S WATER FESTIVAL

MON, MAY 31: MEMORIAL DAY

JUNE 9-10: REGULAR BOARD MEETING

MON, JULY 5: INDEPENDENCE DAY (OBSERVED)

AUG 11-12: REGULAR BOARD MEETING (TOUR TBD)

MON, SEPT 6: LABOR DAY

WED, SEPT 8: BUDGET WORKSHOP

OCT 13-14: REGULAR BOARD MEETING

NOV 25-26: THANKSGIVING

DEC 8-9: REGULAR BOARD MEETING

DEC 23-24: CHRISTMAS

Office & Hydrologic Report October 2020

Southwestern Water Conservation District

OFFICE UPDATE

To save meeting time, I wrote a few notes for the office report here with the hydrologic update.

UPDATE ON SWCD-FLC VIRTUAL EVENT

As I write, more than 100 people have registered for our virtual event "Water Connections: SW's Virtual Water Cooler," hosted jointly with Four Corners Water Center at Fort Lewis College. After seeing the release of Reclamation's dismal five-year forecast and a white paper co-authored by Eric Kuhn addressing future Colorado River basin hydrology, we thought the topic was timely and asked Eric to speak. His talk is titled, "What can the last 20 years tell us about the future of Colorado River hydrology?" We hope it works for you to join us on Wednesday, October 14th from 4:00-5:30 p.m.

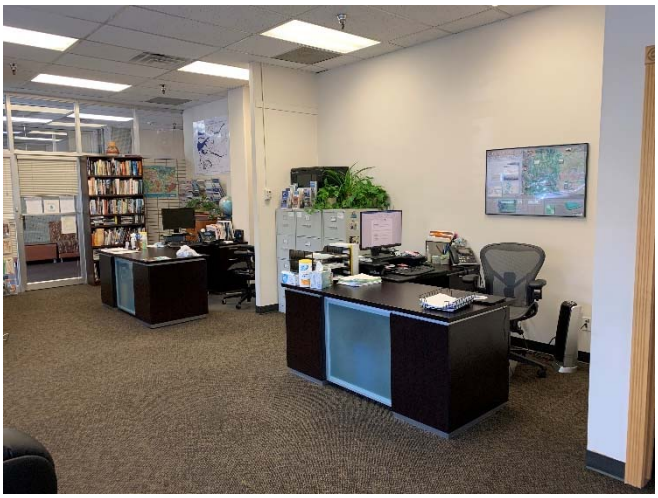
WEATHER MODIFICATION

Western Weather Consultants has applied for one permit to cover all three southwest weather modification programs. In the past, they have had to regularly renew three permits, one for each program in southwest Colorado. This is a positive step toward increased efficiency and cost savings for partner entities including SWCD.

Western Weather Consultants will be working with Desert Research Institute to install a new leased remote generator in southwest Colorado this season, while a new permanent remote generator is fabricated. Thanks in part to SWCD's budgeted match for a new remote generator and our identifying wish list items identified through our recent strategic review of the local weather modification program, CWCB secured significant increases in weather modification funding from the Projects Bill and Lower Basin interests. These additional funds will go to matching SWCD's costs on the new remote generator.

NEW LOOK AT THE OFFICE

In anticipating a new General Manager, I am shaping up the office! I moved furniture, reorganized cabinets, and improved filing. Look at these photos--wouldn't you want to work here?



USGS STREAMGAGING

Update since the budget workshop: La Plata County Commissioners will consider as part of their 2021 budget $5,150 towards annual operations for the USGS Hermosa Creek near Hermosa gage, matching SWCD's $5,150 and Reclamation's $2,575. We will hear the final word on this partnership after their official budget adoption.

PERMANENT RADAR

La Plata County has chosen a site for southwest Colorado's permanent radar, which already has utilities and will provide additional radar coverage for the region. It is yet to be determined, however, if this site will allow radar coverage to reach into the Dolores basin. A recent *Durango Herald* article is included with this report for your reference.

WATER EDUCATION COLORADO

Water Education Colorado wrapped up its Water Fluency program for southwestern Colorado. Several elected officials, water leaders, and ag water users from our region participated in the program which seeks to empower decisionmakers with an understanding of major water organizations and issues.

WEco held its President Reception virtually on September 18th to honor water leaders John Stulp and Paul Bruchez. The event raised nearly $41,000 for the organization—a new record. **Thank you to several board members** and other local water leaders who donated experiences for the live auction. It was great to people bidding on southwest Colorado water-related experiences.

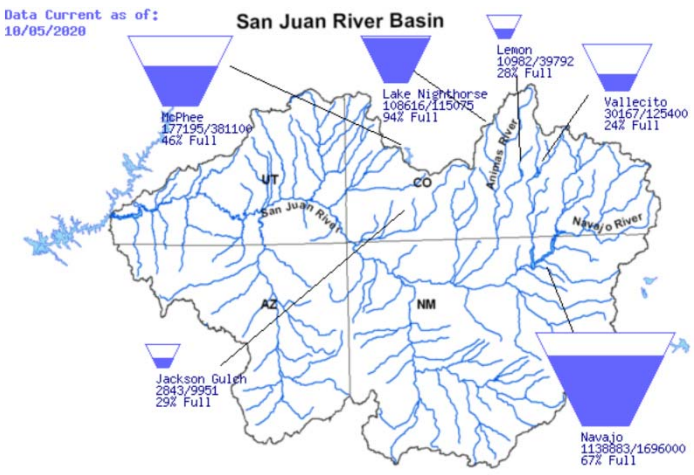
WEco's fall board meeting was held on October 2nd. WEco's November *Headwaters* magazine will focus on land and water trusts, with the spring issue to focus on storage. Thanks to very adaptive leadership, WEco is currently weathering the financial impact of cancelled in-person events and the loss of state funding while still delivering high-quality content and programming.

FOR THE LOVE OF COLORADO COALITION

SWCD and other interested parties have received a request from the *For the Love of Colorado Coalition* to sign on as a member entity, support the coalition's November 2018 recommendations, and provide our logo to share on the website. The request had no deadline, so the board will hear more about this request at a future meeting.

HYDROLOGY SNAPSHOT

Also included with this update is DNR's most recent drought update.

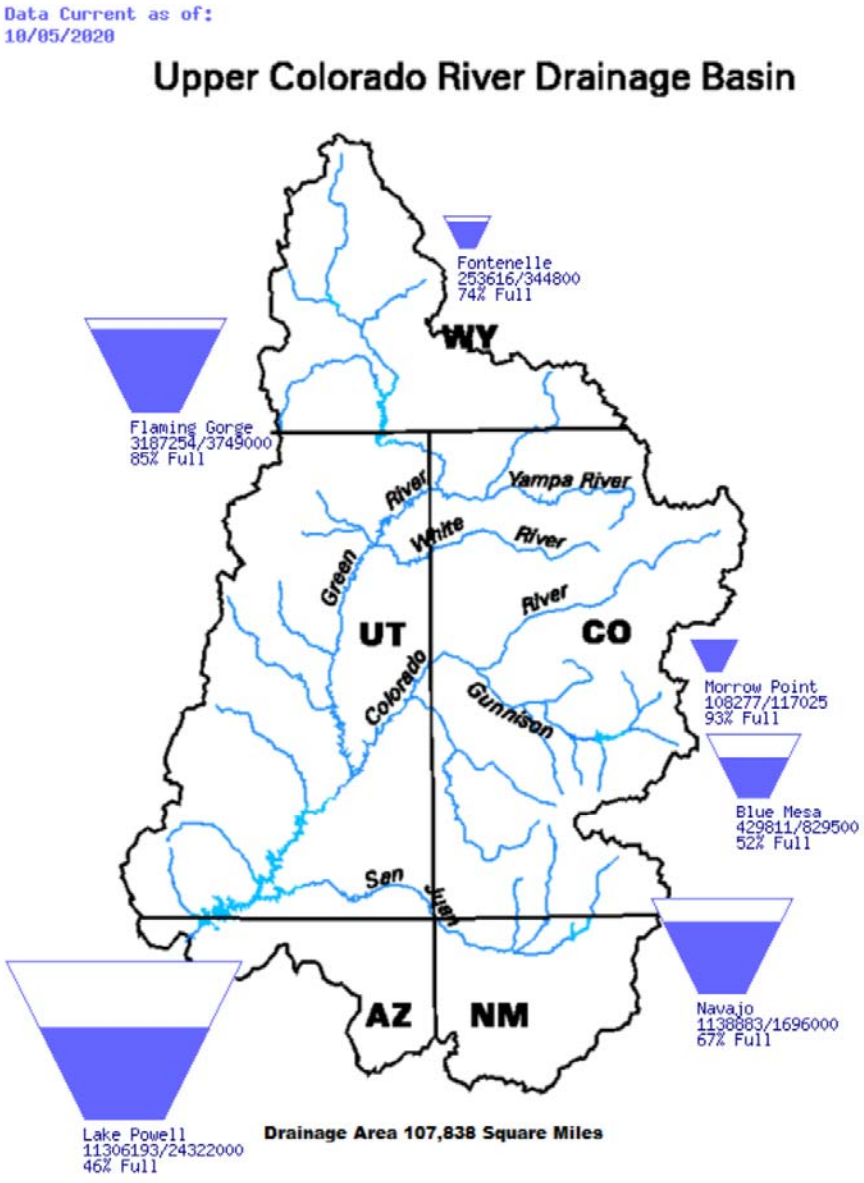


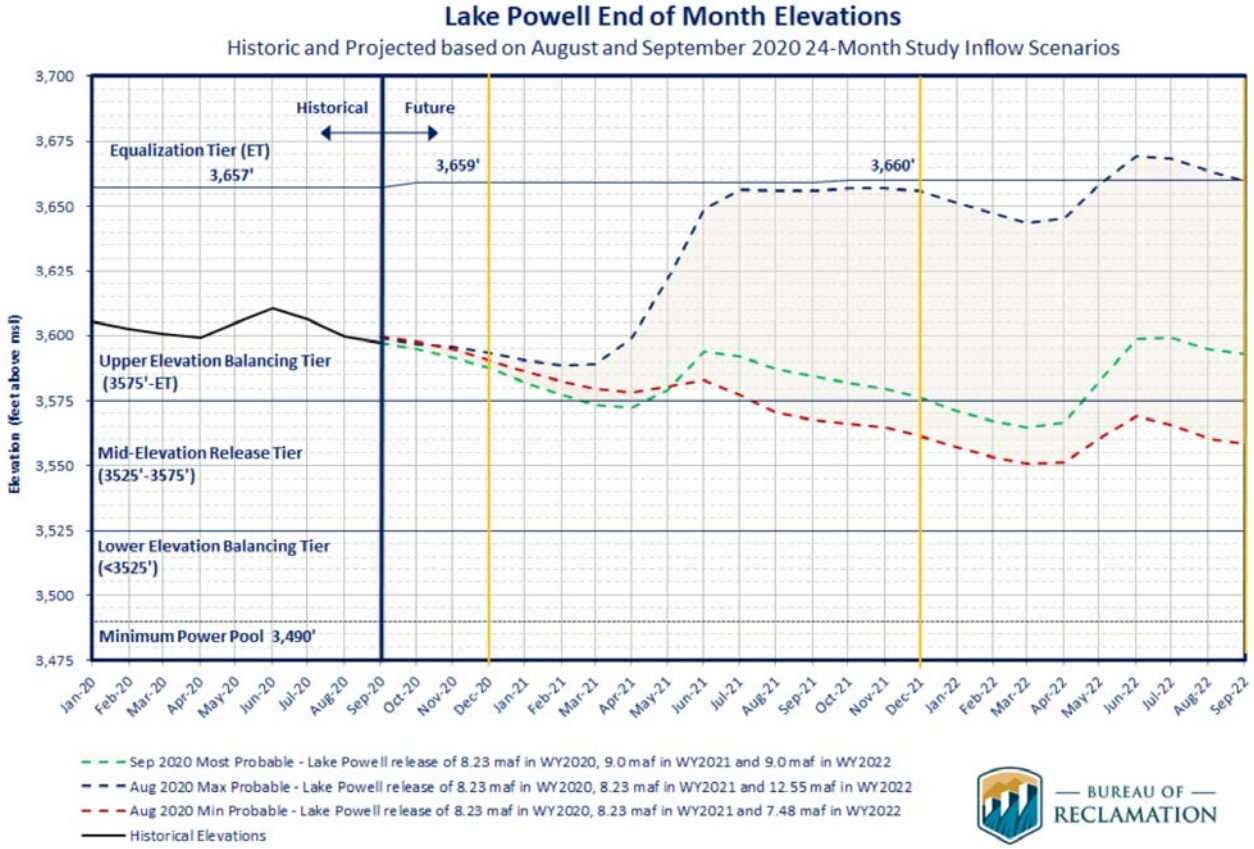
STREAM FLOWS ON 10/5/20

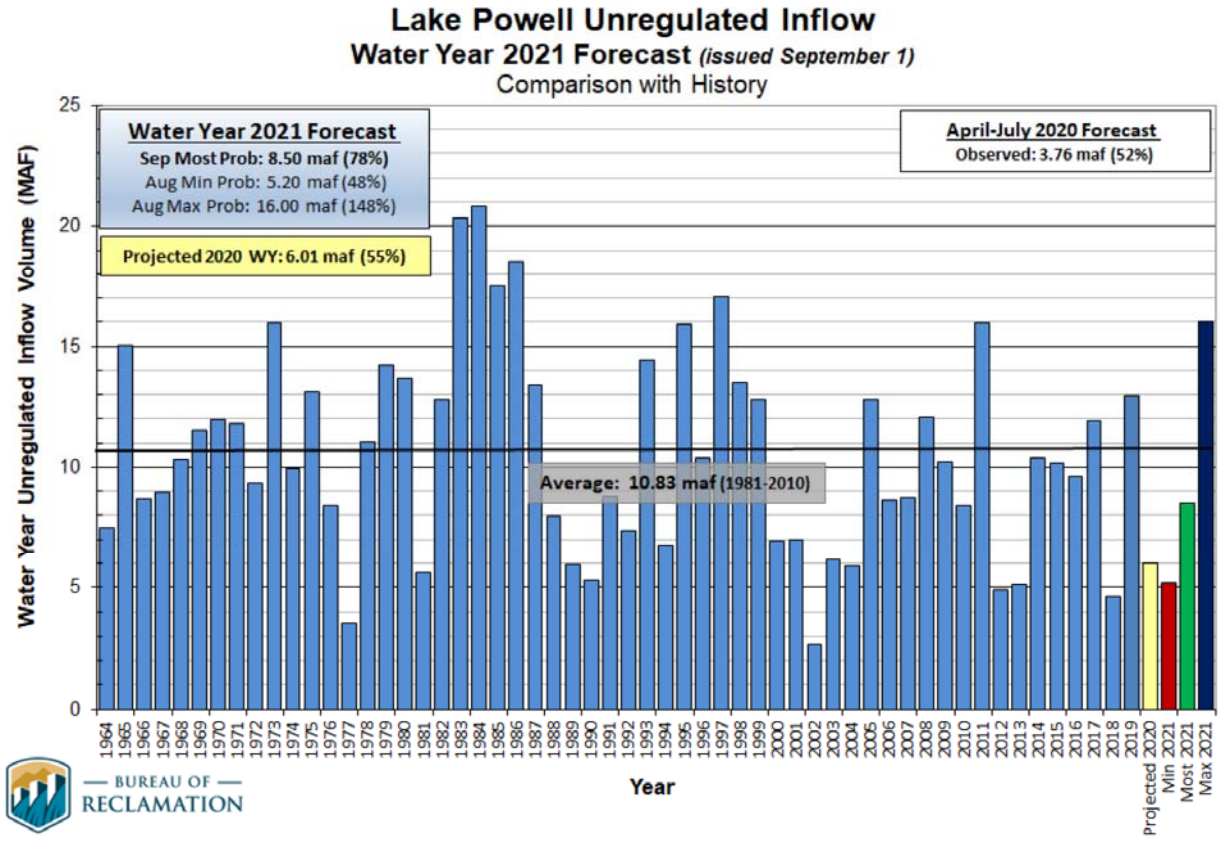
San Juan at Pagosa Springs – 25.1 cfs
Piedra at Arboles – 24 cfs (record low)
Pine near Ignacio – 9.8 cfs
Animas at Durango – 127 cfs (record low)
La Plata at Hesperus – 5.9 cfs
Mancos near Towaoc – 0 cfs
McElmo Creek near Cortez – 53.4 cfs
Dolores at Dolores – 31.3 cfs
San Miguel at Placerville – 67 cfs

THE COLORADO RIVER

COLORADO RIVER HYDROLOGY & STORAGE CONDITIONS The period 2000-2019 was the lowest 20-year period since the gates were closed at Glen Canyon Dam in 1963, with only 4 of the 19 years yielding above average hydrology. **Lake Powell** levels were at 46% of capacity with 11.3 maf in storage on October 5th and the content at **Lake Mead** was 39% of capacity with 10.27 maf in storage. **For Water Year 2020**, coordinated reservoir operations are in the Upper Elevation Balancing Tier. Under this Tier the initial annual water year release volume is 8.23 maf.




Lake Powell End of Month Elevations
Historic and Projected based on August and September 2020 24-Month Study Inflow Scenarios
Historical
Future
Equalization Tier (ET)
3,657'
3,659'
3,660'
Upper Elevation Balancing Tier
(3575'-ET)
Mid-Elevation Release Tier
(3525'-3575')
Lower Elevation Balancing Tier
(<3525')
Minimum Power Pool 3,490'
Elevation (feet above msl)
3,700
3,675
3,650
3,625
3,600
3,575
3,550
3,525
3,500
3,475
Jan-20 Feb-20 Mar-20 Apr-20 May-20 Jun-20 Jul-20 Aug-20 Sep-20 Oct-20 Nov-20 Dec-20 Jan-21 Feb-21 Mar-21 Apr-21 May-21 Jun-21 Jul-21 Aug-21 Sep-21 Oct-21 Nov-21 Dec-21 Jan-22 Feb-22 Mar-22 Apr-22 May-22 Jun-22 Jul-22 Aug-22 Sep-22
Sep 2020 Most Probable - Lake Powell release of 8.23 maf in WY2020, 9.0 maf in WY2021 and 9.0 maf in WY2022
Aug 2020 Max Probable - Lake Powell release of 8.23 maf in WY2020, 8.23 maf in WY2021 and 12.55 maf in WY2022
Aug 2020 Min Probable - Lake Powell release of 8.23 maf in WY2020, 8.23 maf in WY2021 and 7.48 maf in WY2022
Historical Elevations
BUREAU OF RECLAMATION

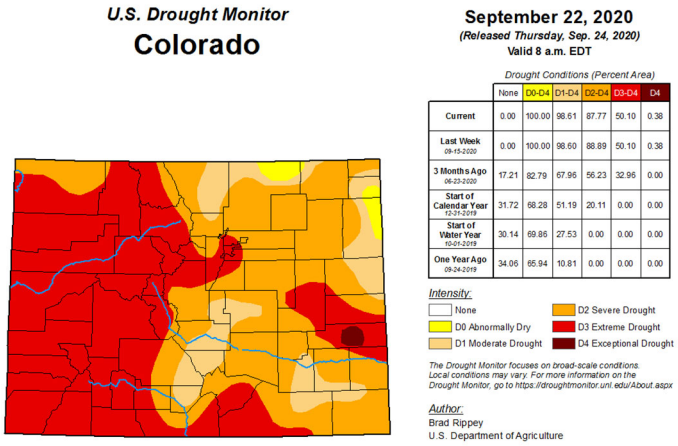

Lake Powell Unregulated Inflow
Water Year 2021 Forecast (issued September 1)
Comparison with History
Water Year 2021 Forecast
Sep Most Prob: 8.50 maf (78%)
Aug Min Prob: 5.20 maf (48%)
Aug Max Prob: 16.00 maf (148%)
Projected 2020 WY: 6.01 maf (55%)
April-July 2020 Forecast
Observed: 3.76 maf (52%)
Average: 10.83 maf (1981-2010)
Water Year Unregulated Inflow Volume (MAF)
25
20
15
10
5
0
1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 Projected 2020 Min 2021 Most 2021 Max 2021
Year
BUREAU OF RECLAMATION

COLORADO
Department of Natural Resources

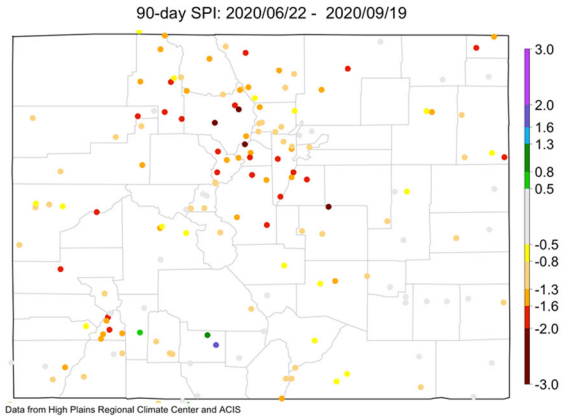
September 2020 Drought Update

As the end of the water year draws near, Colorado experienced the hottest August on record since record keeping began in 1895. As of September 15th, the entire state is covered in dry conditions with over 50% of our state in extreme or exceptional drought. Minor temporary soil moisture improvements were made with the September 9th snowfall. The early storm broke numerous records including a record low temperature, earliest freeze, and the shortest number of days between a 100 degree day and a measurable snowfall. This widespread precipitation event extended over the eastern plains and resulted in over 10 inches of snow in north central Colorado and the San Luis Valley - with some areas logging up to 18 inches. While this event brought SNOTEL measures to near average precipitation for September, August and September are still extremely (or near record) dry months for the state. **On September 21, 2020, Governor Polis expanded Drought Plan activation to all 64 Colorado counties.**

The Sept. 24 U.S. Drought Monitor, logged 0.4% of the state in D4 (exceptional) drought conditions; D3 (extreme) drought in 50% of the state; D2 (severe) drought covering 38%; and D1 (moderate) drought covering 11% of the state.

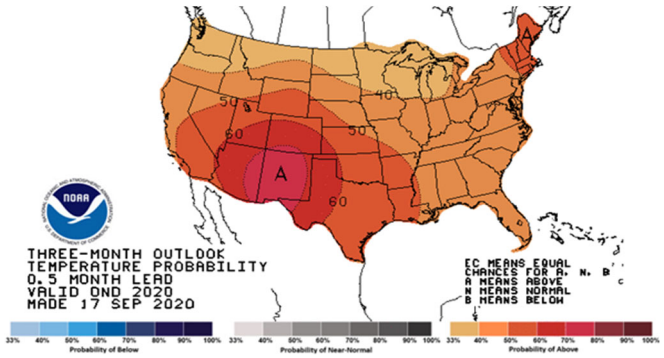


The 90-day Standardized Precipitation Index (SPI) (June 22 to Sept 19) shows consistent dryness across the state with deeper shortfalls more prevalent throughout north central Colorado and front range. Below average precipitation is expected to continue over the next two weeks.



Tropical Sea Surface Temperatures indicate La Niña conditions, and the CPC issued a La Niña Advisory. There is now a 75% chance that weak La Niña conditions will continue throughout the fall/winter, increasing the likelihood of warm extremes for the state and less snow for the southern mountains and eastern plains.

The NOAA Climate Prediction Center three month outlook maps indicate higher chances for above average temperatures over fall and winter with a slightly enhanced chance of below average precip.



Statewide reservoir storage is currently at 85% of average, down from 90% last month. Storage in the northern half of the state is near average while the southern half of the state ranges from 67% to 77% of average.

Municipal water providers continue to report increased demands and most municipalities are experiencing normal to slightly below normal storage. Water providers are monitoring conditions as they consider the need for future restrictions. Currently, the following municipalities have active watering restrictions, due to the compounding impacts of wildfire: Glenwood Springs (active Aug. 15), Fort Collins (beginning Oct 1)

Next Water Availability Task Force Webinar:

NOVEMBER 24, 2020 9:30a - 11:30a
Co-Chairs: Megan Holcomb, CWCB & Tracy Kosloff, DWR
Questions? Contact ben.wade@state.co.us
Additional info at cwcb.colorado.gov/drought

THE Durango HERALD

Location for new radar system in Four Corners is finalized

Weather station will be built south of Durango

By Jonathan Romeo (/staff/48-jonathan-romeo) County & environment reporter

Tuesday, Sept. 29, 2020 5:03 AM

Listen

00:00 03:05

A location has been finalized for a new permanent weather station for the Four Corners, which is expected to fill in what's known as a blind spot when it comes to weather and radar modeling in the region.

It was announced Monday that La Plata County and the Southern Ute Indian Tribe have partnered to secure a site on tribal lands along U.S. Highway 550 near Bondad, about 15 miles south of Durango.

The site currently is the location of the SUIT's air monitoring station that tracks air quality and meteorological conditions. The goal is to have the new station up and running by the end of 2021.

"This is a win for the community," said county spokeswoman Megan Graham.

Butch Knowlton, director of La Plata County's Office of Emergency Management, said a location atop Black Ridge, also known as Bridge Timber Mountain, was identified early on as the best location for radar coverage.

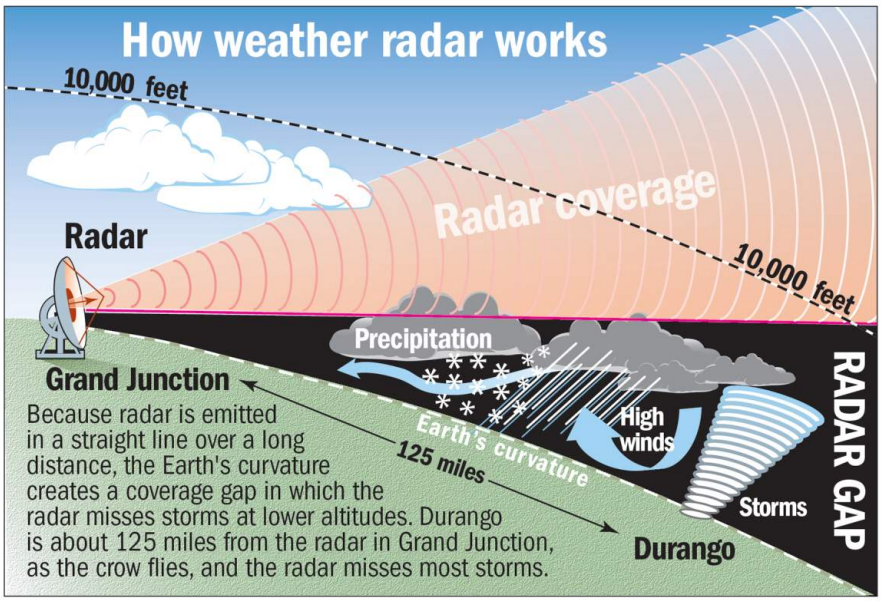
"We could see basically everywhere," Knowlton said.

But the site, located on private land, had no road access or any infrastructure like electricity or fiber, which would have made it a costly and time-consuming project, Graham said.

The location near Bondad, however, still meets the criteria of the project.

“It might not be perfect, but it’s good,” she said. “It’s going to fill the gaps that are currently problematic for this region.”

The Four Corners has long been known as a blind spot when it comes to weather and radar modeling (https://durangoherald.com/articles/257957), as major hubs in Albuquerque, Grand Junction and Flagstaff, Arizona, take in data at elevations too high to accurately hone in on the region.



Cliff Vancura/ Durango Herald

In Grand Junction, for instance, the radar system on Grand Mesa can’t pick up storms that come into the Four Corners below 28,000 feet in altitude, which causes weather forecasters to miss a good number of incoming storms.

For years, there has been a desire to bring a radar system to the region. But the need became critical after the 416 Fire in summer 2018 created flood danger when storms hit the fire’s burn scar.

In 2019, the Colorado Department of Local Affairs awarded $1.7 million in funding for a permanent radar system, clearing the biggest obstacle in the project's path.

Graham said the project will soon go out for bid.

As far as funding the continued maintenance and operation of the system, local officials are using Alamosa County as a model. There, the county set up a group of partners to help keep the radar running.

Graham said a handful of local agencies – including the Durango-La Plata County Airport, La Plata Electric Association and Southwest Water Conservation Board – have signed up to help with long-term funding.

Graham said the fund would collect about $30,000 a year, both for yearly operating costs and as a means of saving money for long-term maintenance projects.

SUIT spokeswoman Lindsay Box did not provide comment Monday.

In a prepared statement, SUIT Chairman Christine Sage said: "The weather radar station is a collaborative relation with the County. Where we keep the communication continuing so that works for both the Southern Ute Indian Tribe and La Plata County. Here we are having that share with each other for the betterment of the Tribe and the county."

jromeo@durangoherald.com

LEAGUE OF WOMEN VOTERS®
OF LA PLATA COUNTY

October 7, 2020

Dear Laura:

A I am sure you are aware, the League of Women Voters(LWV) is a nonpartisan voter education and advocacy organization that has been working on voter rights and providing nonpartisan educational information on topics of public concern and the processes of government for 100 years. As part of our work we do, from time to time, advocate, in a nonpartisan manner, on issues of concern to the general public.

In this year's Colorado State elections, Amendment B is one such issue. The League strongly believes that the Gallagher Amendment must be repealed in order to maintain the funding we need for critical services such as local schools, fire departments, hospitals, emergency and water services. Additionally, we believe that this repeal will also aid businesses who have been unfairly shouldering the tax burden under Gallagher.

To help with that effort, we would like the Southwest Water Conservation District to join the LWV in public messaging over the next few weeks in support of the repeal.

The La Plata LWV has designed a series of social media messages and drafted a letter to the editor of The Herald as well as plan to have a paid ad encouraging voters to vote yes on the repeal. We have several La Plata County organizations and special districts who have "signed on" to the messages and are hoping to add the SW Water Conservation District to that list.

We thank you for your consideration; please feel free to contact me if you have additional questions. I look forward to hearing from you.

Sincerely,

Laurie Meininger
Board Member-at-Large

BBC RESEARCH & CONSULTING

ERO Resources Corporation

Headwaters CORPORATION

Upper Basin Demand Management Economic Study in Western Colorado

REVISED FINAL REPORT

Revised Final Report

September 8, 2020

Upper Basin Demand Management Economic Study in Western Colorado

Prepared for
The Water Bank Work Group

Prepared by
BBC Research & Consulting
1999 Broadway, Suite 2200
Denver, Colorado 80202-9750
303.321.2547 fax 303.399.0448
www.bbcresearch.com

and

ERO Resources Corporation

and

Headwaters Corporation

BBC RESEARCH & CONSULTING

Key findings. Some highlights from the numerous metrics provided in the report.

- Annual payments to participating irrigators were projected to range from $194 to $263 per AF (approximately double those amounts per acre). Payment levels necessary to successfully enroll participants could vary from year to year and location to location.

- If the funding to compensate participating irrigators in a demand management program comes from outside of Western Colorado, those payments – and the multiplier effects from the portion of the payments that is spent locally – would provide a regional economic benefit that could help offset adverse impacts on local communities.

- Reduced production of forage crops is likely to require fewer purchases of agricultural inputs such as seed, fertilizer, custom labor, hauling and other services. An estimated 55 full and part-time agricultural support jobs could be eliminated under the Moderate DM scenario, 236 jobs under the Aggressive DM scenario.

- Overall, the projected secondary economic benefits from payment spending are comparable in scale to the projected negative secondary impacts from reduced production. But, the jobs that would be supported by local payment spending could well be different from the jobs currently supported by forage production.

- Based on historical correlations between hay production, hay prices and the Western Colorado livestock inventory, the Aggressive DM scenario could increase local hay prices by about 6 percent, and decrease the regional livestock inventory by about 2 percent. Potential price and livestock impacts under the Moderate DM scenario would be much smaller.

Uncertainties and limitations. The economic estimates in this study are based on publicly available information and basin-level average characteristics of farms and ranches in Western Colorado. Actual effects would likely differ from the estimates depending on the specific characteristics of participating farms and ranches. Other important uncertainties:

- The analysis included estimated multi-year impacts on grass hay yields from fallowing (ceasing irrigation) for a single year. No studies were identified that had evaluated effects on subsequent grass hay yields from more extended fallowing periods.

- Assumptions incorporated in this analysis – full fallowing of harvested acres and potential reductions in livestock production – could result in larger economic impacts than alternative strategies for reducing consumptive use such as split season fallowing.

- Stakeholders in each basin emphasized their concerns about potential impacts on return flows relied on by downstream irrigators and other users. This analysis assumes that return flow issues associated with DM will be resolved – either through avoiding these issues or effectively mitigating them.

Summary Comparison of Potential Economic Benefits and Adverse Impacts from Demand Management in Western Colorado

Moderate DM scenario

	River Basin				
	Colorado River	Gunnison	Southwest	Yampa/White	Western Colorado
Participating Acres	3,400	3,850	3,700	1,750	12,700
Percent of Irrigated	1-in-60	1-in-60	1-in-60	1-in-60	1-in-60
On-Farm/Ranch Effects					
Decrease in Production Output*	-$1,374,000 to -$2,210,000	-$1,780,000 to -$2,731,000	-$1,725,000 to -$2,274,000	-$783,000 to -$1,455,000	-$5,662,000 to -$8,670,000
Reduced On-Farm/Ranch Jobs**	-17 to -22	-19 to -25	-19 to -22	-9 to -13	-64 to -81
Annual DM Payments	$1,375,000	$1,917,000	$1,756,000	$806,000	$5,854,000
Payments vs. On-farm Value-added (net)*	$682,000 to $473,000	$1,093,000 to $873,000	$735,000 to $606,000	$391,000 to $233,000	$2,901,000 to $2,185,000
Secondary Effects					
Increased Jobs from Payment Spending***	6 to 10	9 to 14	8 to 12	4 to 5	27 to 40
Decreased Jobs tied to Production*	-13 to -19	-16 to -22	-16 to -20	-10 to -15	-55 to -76
Net change in Secondary Jobs****	-3 to -13	-2 to -13	-4 to -12	-5 to -11	-14 to -49
Value-added****	$72,000 to -$167,000	$136,000 to -$132,000	$231,000 to -$71,000	$107,000 to -$23,000	$546,000 to -$393,000

Aggressive DM scenario

	River Basin				
	Colorado River	Gunnison	Southwest	Yampa/White	Western Colorado
Participating Acres	12,000	12,100	13,800	14,200	52,100
Percent of Irrigated	1-in-17	1-in-19	1-in-16	1-in-8	1-in-15
On-Farm/Ranch Effects					
Decrease in Production Output*	-$4,847,000 to -$7,795,000	-$5,574,000 to -$8,552,000	-$6,458,000 to -$8,515,000	-$6,334,000 to -$11,775,000	-$23,213,000 to -$36,637,000
Reduced On-Farm/Ranch Jobs**	-60 to -77	-60 to -77	-69 to -81	-71 to -102	-260 to -337
Annual DM Payments	$4,851,000	$6,005,000	$6,573,000	$6,524,000	$23,953,000
Payments vs. On-farm Value-added (net)*	$2,406,000 to $1,670,000	$3,424,000 to $2,734,000	$2,752,000 to $2,269,000	$3,166,000 to $1,890,000	$11,748,000 to $8,563,000
Secondary Effects					
Increased Jobs from Payment Spending***	23 to 34	28 to 43	29 to 44	29 to 43	109 to 164
Decreased Jobs tied to Production*	-45 to -67	-50 to -70	-59 to -75	-82 to -119	-236 to -331
Net change in Secondary Jobs****	-12 to -45	-7 to -41	-14 to -46	-39 to -90	-72 to -222
Value-added****	$252,000 to -$590,000	$424,000 to -$416,000	$863,000 to -$267,000	$863,000 to -$189,000	$2,402,000 to -$1,462,000

Notes: *Low end of range if 60% spent locally, high end if 90% spent locally.

**Right-hand side (RHS) impact estimates include potential effects on livestock activity.

***On-farm employment is FTEs. Left-hand side (LHS) estimate is jobs on participating operations only (who would be compensated). RHS estimates include potential livestock effects.

****RHS impacts on secondary jobs reflects low share of lease spending in basin and adverse impacts including livestock effects.

Program design considerations. A demand management program involving up to four to five percent of the irrigated forage acres in Western Colorado (about 30,000 acres or 60,000 acre-feet per year) would be within the range of historical variability in hay production. Program design elements to help reduce adverse impacts on Western Colorado agricultural communities could include:

- Designing the program to widely spread participation and impacts among and within the four Western Colorado basins;
- Limiting the frequency and duration of participation to avoid demand management becoming an irrigated land retirement program;
- Providing the opportunity for participants to opt out under exceptionally dry conditions like 2002, 2012 and 2018 (if the program is based on multi-year contracts); and
- Offering opportunities for split season fallowing or other forms of deficit irrigation which could reduce impacts and costs.

EXECUTIVE SUMMARY

Potential failure to meet Colorado River compact requirements is a big issue that must be addressed but cannot be solved by demand management alone. If a demand management program is implemented, it should support participation from the range of geographic areas and water using sectors that benefit from use of the Colorado River while avoiding disproportionate impacts. Although this study focused on potential effects from reductions in agricultural consumptive use in Western Colorado under a temporary, voluntary and compensated program; that focus does not imply that Western Slope agriculture should bear a disproportionate share of the burden for demand management.

At the beginning of the study, stakeholder groups were organized in each of the four major river basins in Western Colorado. These groups included representatives with expertise in agriculture, agricultural support businesses, recreation and tourism, banking and finance, local government issues and other aspects of the local economies and communities. The study team met with each stakeholder group twice – during the late summer of 2019 and during the spring of 2020– to discuss data and data sources, assumptions and methodology, and preliminary study findings. Input from the stakeholders helped identify key issues and refine the study approach and results.

Agriculture is an important economic, cultural, and aesthetic component of Western Colorado. There are nearly 12,000 farms in Western Colorado covering a total of more than 5.7 million acres of land. Approximately 70 percent of Western Colorado farms have irrigation, and irrigated acreage constitutes about 12 percent of the region's total farm lands. Agricultural activity in Western Colorado directly provides approximately 13,600 jobs, which is about 3 percent of the total jobs in the region across all industries. The number of direct agricultural jobs in each basin ranges from 2,300 jobs in the Yampa/White Basin to 4,300 jobs in the Colorado Basin. Agricultural activity also supports numerous secondary jobs in supporting industries throughout Western Colorado,

A small portion of Western Colorado's crop farming activity takes place within the fruit farming sector—and even smaller portions in grain, vegetable, and greenhouse production—but crop farming in the region is primarily in grass hay and alfalfa production, which in turn is predominantly an input to cattle and horse ranching. Livestock production accounts for 64 percent of Western Colorado's annual $750 million in agricultural output and 48 percent of the region's annual $246 million in agricultural income.

The latest estimates for the Technical Update to the Water Plan indicate there are a total of approximately 771,000 irrigated acres across the four Western Colorado basins, and annual consumptive use of 1.5 million acre-feet (AF) of water per year on those acres. These numbers correspond to average consumptive use of about 2.0 AF per acre.

Demand management scenarios. Many aspects of demand management are yet to be defined. Developing an evaluation of the potential economic implications of demand management in Western Colorado that provides more than a basic qualitative assessment required some general assumptions regarding possible aspects of a demand management program. The BBC team worked with the WBWG to identify and develop two scenarios for a potential demand management program involving Western Colorado agricultural water users.

The "Moderate" demand management" scenario (Scenario 1) was based on the Demand Management Storage Agreement signed by the Upper Basin states in 2019. The Moderate scenario assumes 125,000 AF of consumptive use reductions would be obtained from a demand management program involving Western Colorado irrigators over a five-year period – or, put more simply, a 25,000 AF annual reduction in consumptive use from participating Western Colorado farms and ranches for five years. In effect, this scenario assumes about one in every 60 irrigated acres currently in hay or corn production across Western Colorado would be temporarily fallowed by participants in the demand management program.

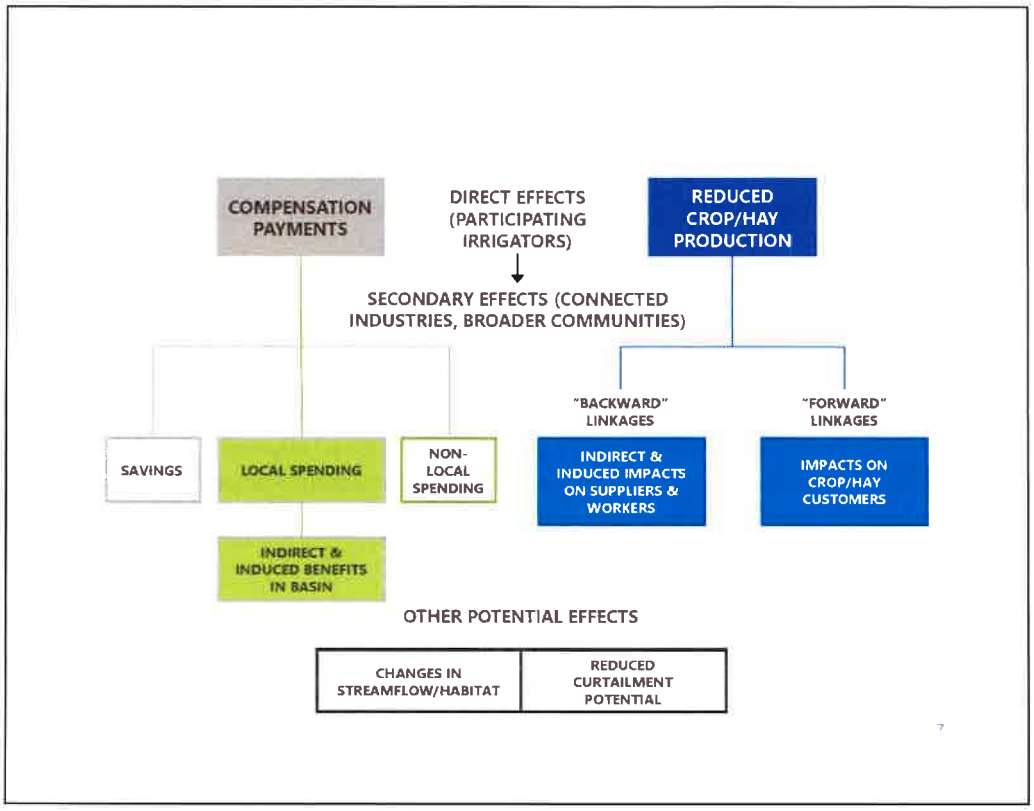
The "Aggressive" demand management scenario (Scenario 2) was designed to examine the potential effects from a larger or more geographically concentrated demand management program. This scenario examines an annual 25,000 AF reduction in consumptive use in each of the four major river basins, which could also correspond to a 100,000 AF annual reduction in consumptive use from irrigated agriculture across all of Western Colorado.[1] The Aggressive demand management scenario assumes that the proportion of acres fallowed for demand management could range from about one in eight acres (in the Yampa/White Basin) to about one in 18 acres in the Gunnison Basin.

Framework for evaluation. Figure ES-1 on the following page illustrates the overall structure for the economic analysis. The starting point for the analysis was to estimate the direct effects on participating irrigators under the two demand management scenarios. Those direct effects included the compensation or participation payments and the reduction in agricultural production. To estimate the potential level of compensation that could be required and the direct economic value of decreases in farm and ranch production, the study team developed simplified, basin-specific crop enterprise budgets for grass hay and alfalfa. The crop budget for the small proportion of each scenario's acres planted in corn prior to temporary fallowing was based on regional Western Colorado crop budget due to data limitations at the county level.

Indirect and induced economic effects (also called secondary or "multiplier effects") that could result from demand management were estimated using four basin-specific IMPLAN input-output models. The IMPLAN models were used to quantify the potential secondary economic benefits from the local spending of demand management participation payments, and the secondary economic impacts from reduced forage production, within each basin. The IMPLAN models were also used to help quantify the potential effects of demand management on livestock raising due to forward linkages from forage production,

[1] The WBWG is not endorsing the concept of equal sharing of consumptive use reduction among the four basins. The aggressive scenario is simply intended to provide information on the potential economic effects of larger scale consumptive use reductions in each basin.

Figure ES-1. Secondary impact analysis framework



Potential economic benefits. If a demand management program is implemented in Western Colorado, it is expected to involve voluntary and compensated reductions in consumptive irrigation use. The compensation payments would provide a direct benefit to participating farmers and ranchers, and could also produce secondary economic benefits within the region as those funds are spent on local goods and services. Based on the basin-specific crop enterprise budgets, generalized estimates of potential payment levels were developed for each of the basins. The estimated compensation required for irrigators to simply "break-even" ranged from $136 to $183 per AF of consumptive use across the basins, with an overall average for Western Colorado of $164 per AF. Adding the projected 50% premium on "lost" net operating income, the projected participation payments ranged from $194 to $263 per AF. Participation payments per acre would likely be approximately double the payments per AF.

The potential level of compensation necessary for a successful demand management program could vary substantially simply due to variability in the crop mix and crop yields from location to location. Compensation requirements could also vary substantially from year to year depending on variations in hydrologic and weather conditions, crop prices, yields and other financial and market conditions. Apart from payments to participating irrigators, a demand management

program could also need to compensate the ditch companies serving the participants to offset lost revenues from reduced water assessments or duties, administrative costs, and other factors.

Apart from the direct financial effects on program participants, the participation payments under a demand management program could produce additional, secondary economic benefits in Western Colorado. Under the Moderate demand management scenario. The share of the participation payments spent locally is projected to support between 27 and 40 jobs (full and part-time) across Western Colorado, and between $3.6 and $5.5 million in annual regional output. Under the Aggressive scenario, the share of the participation payments spent locally is projected to support between 109 and 164 jobs (full and part-time) across Western Colorado, and between $15 and $23 million in annual regional output.

If the money to compensate participating irrigators in a demand management program comes from outside of Western Colorado, those payments – and the multiplier effects from the portion of the payments that is spent locally – would truly represent an economic benefit from a regional or basin standpoint. However, to the extent that those funds are raised within Western Colorado (for example from fees or taxes), the participation payments, and any secondary benefits associated with their spending, would not represent a net economic benefit to the region, but would simply redistribute funds already in the region away from their sources to participating irrigators.

Of course, the primary purpose of a demand management program would be to reduce the likelihood of the Upper Basin failing to meet Colorado River compact requirements and potentially facing an involuntary curtailment of at least a portion of its use of Colorado River water supplies. A demand management program can be considered akin to an insurance policy on a home or automobile. A "water bank" developed through an Upper Basin demand management program would provide another tool for water managers to use if needed, along with modified drought operations of Federally managed Colorado River basin storage facilities and other emergency measures.

From a recreation and environmental standpoint, a demand management program would likely have mixed effects. Increases in streamflow from reduced consumptive use would likely be beneficial. However, demand management could also reduce late season irrigation return flows which can be critical from and environmental and recreation standpoint. The reduction in irrigated acreage from demand management would also reduce forage and habitat for wildlife such as deer and elk.

Potential adverse economic impacts. Reducing irrigation consumptive use by farmers and ranchers participating in a demand management program in Western Colorado is likely to reduce crop production, particularly of forage crops including grass hay and alfalfa. Reduced crop production, in turn is likely to require fewer purchases of agricultural inputs such as seed, fertilizer, custom labor, hauling and other services. A decrease in forage crop production could, in turn, affect the livestock industry.

From the standpoint of Western Colorado as a whole, fallowing acres to reduce consumptive use is projected to directly reduce annual hay and corn production by about $6 million per year under Scenario 1, or by about $23 million per year under Scenario 2. These "average year"

estimates are based on the value of mechanically harvested hay and corn and include the projected multi-year effects from fallowing grass hay.

Projected secondary impacts (indirect and induced effects) under the Moderate demand management scenario include about 55 full and part-time positions across Western Colorado, and about $4.2 million in annual output and $2.3 million in annual value-added. Combined with direct effects, changes in participating farm and ranch production under the Moderate demand management scenario are projected to reduce regional output by about $10 million per year and regional value-added (including labor income and income of self-employed proprietors) by a little over $5 million per year.

In total, reduced production on participating farms and ranches under the Aggressive demand management scenario is projected to reduce regional output by about $40 million per year and regional value-added (including labor income and income of self-employed proprietors) by a little over $21 million per year and affect about 500 jobs – though more than half of these affected jobs would occur on participating farms and ranches and likely would most consist of producers that chose to participate in demand management and would be compensated.

Overall, the projected indirect and induced economic benefits from payment spending on regional output and value-added are comparable in scale to the projected negative secondary effects from reduced production. While the secondary benefits from payment spending may largely offset the negative secondary impacts from reduced production from a quantitative standpoint, it is important to note that this net effects comparison masks the underlying distribution of the economic benefits and costs. Although there would be some overlap among industries providing services to farm/ranch households, in many cases the jobs that would be supported by local payment spending are different from the jobs that are currently supported by forage production.

Potential effects on livestock production. If a demand management program leads to large reductions in forage production in Western Colorado, it could also impact local hay prices and livestock production. In part, effects on livestock production could depend on who participates in the program and how they adjust their operations. Prior research for the WBWG found that among high elevation sites that operate to support a cattle operation, the size of the cattle herd is directly tied to the amount of irrigated acreage. Alternatively, a number of the basin stakeholders noted that much of the hay in some of the basins is exported out of state, and in some cases to other countries. This appears to be particularly true among producers in the Southwest Basin and the Yampa/White Basin, and is supported by data from the basin-specific IMPLAN models. To the extent that participants in a demand management program would otherwise have exported their hay, the "forward linked" effects of demand management on the livestock industry within Western Colorado could be minimal.

In order to shed additional light on potential forward-linked impacts on the livestock industry, the study team examined historical correlations between hay production, hay prices and livestock inventories. Although correlation does not prove a causal relationship, on average a 10 percent reduction in hay production has correlated with an 8 percent increase in hay prices. Statistical analysis indicates that, on average, a 10 percent reduction in Western Colorado hay production has also correlated with a 3 percent decrease in cattle inventories during the

following year. Other factors, such as long-run national "cattle cycles" would likely continue to have more influence on cattle inventories and production than a demand management program.

Based on the historical correlations, the Moderate demand management scenario could result in slightly more than 0.5% reduction in livestock production, or a reduction in ranch output of about $3 million per year across Western Colorado. The corresponding decrease in annual value-added and jobs on Western Colorado ranches is estimated at about $700,00 and 17 FTE jobs. If livestock production declines, there would also be secondary (indirect and induced) impacts on Western Colorado's economy. Under the Moderate demand management scenario, these secondary impacts are projected to include a nearly $1.7 million annual reduction in output among firms and individuals who provide goods and services to Western Colorado ranches and their households, and a decline of about 21 full and part-time jobs.

The potential 2.2 percent reduction in livestock production under the Aggressive demand management scenario would correspond to larger forward linked impacts in each of the basins and across Western Colorado. The Aggressive demand management scenario could lead to a decline of $13.4 million in annual ranch output and the loss of about 77 FTE ranch jobs. Including indirect and induced impacts, the total impact from reduced livestock production on annual output in Western Colorado could be about $21 million per year, with a corresponding decrease in value-added of about $6.6 million. About 95 part-time and full-time secondary jobs could be affected by reduced livestock production under the Aggressive demand management scenario.

Comparison of economic benefits relative to adverse impacts. Figure ES-2 provides a summary comparison of selected economic metrics for the Moderate demand management scenario. Figure ES-3 shows the same metrics for the Aggressive demand management scenario.

On-farm/ranch effects. The lower end of the range of potential annual reductions in production output in each basin and across Western Colorado indicates projected effects on farms and ranches that choose to participate in the demand management program, excluding any "forward-linked" impacts on livestock production. The higher end of the range includes potential annual reductions in the value of livestock sales. Likewise, the smaller decline in the on-farm/ranch jobs excludes potential effects on livestock producers – so these job estimates primarily reflect producers and their families who would be compensated through the participation payments (though some of these jobs may be hired workers). The larger declines in these metrics include potential decreases in output by livestock producers and potential on-farm (or ranch) reductions in jobs among these producers. All on-farm/ranch jobs are reported in FTEs.

Figures ES-2 and ES-3 also report the projected aggregate annual payments to participants under the Moderate demand management scenario. Those payment totals are compared to the projected decrease in on-farm/ranch value-added (income) due to reduced production. In all cases, the payment totals are projected to exceed the loss of income on participating acres – indicating that participants are projected to benefit financially from a demand management program. Even when reductions in income from reduced livestock production are included (which produces the smaller numbers in the "Payments vs. on-farm value-added" ranges), the overall net effect of the program on farm and ranch income is projected to be positive.

Secondary effects. The secondary effects comparison in Figures ES-2 and ES-3 initially summarize the projected range of jobs that could be supported by local spending of a portion of the demand management participation payments. The lower estimate is based on 60 percent of the payments being spent locally, while the higher benefit estimate assumes 90 percent is spent locally. These secondary (indirect and induced) job benefits are then compared to the projected reduction in secondary jobs from decreased farm and ranch production. The higher end of that range includes the potential secondary job impacts from reductions in livestock production.

The projected net change in secondary jobs is always negative, in part because average compensation among the secondary jobs in agricultural support industries is lower than the average compensation among the secondary jobs that would be supported by local spending of the participation payments (as discussed previously). The comparison of effects on secondary income (value-added) is more ambiguous. If a high proportion (90 percent) of the participation payments is spent locally, and livestock production is not affected by the program, the net effect on secondary (indirect and induced) income is projected to be positive. Alternatively, if a lower proportion (60 percent) of the participation payments is spent locally and livestock production is impacted by the program, the net change in secondary value-added is projected to be negative.

Figure ES-2. Summary comparison of benefits and adverse impacts for the Moderate demand management scenario

	River Basin				
	Colorado River	Gunnison	Southwest	Yampa/White	Western Colorado
Participating Acres	3,400	3,850	3,700	1,750	12,700
Percent of Irrigated	1-in-60	1-in-60	1-in-60	1-in-60	1-in-60
On-Farm/Ranch Effects					
Decrease in Production Output*	-$1,374,000 to -$2,210,000	-$1,780,000 to -$2,731,000	-$1,725,000 to -$2,274,000	-$783,000 to -$1,455,000	-$5,662,000 to -$8,670,000
Reduced On-Farm/Ranch Jobs**	-17 to -22	-19 to -25	-19 to -22	-9 to -13	-64 to -81
Annual DM Payments	$1,375,000	$1,917,000	$1,756,000	$806,000	$5,854,000
Payments vs. On-farm Value-added (net)*	$682,000 to $473,000	$1,093,000 to $873,000	$735,000 to $606,000	$391,000 to $233,000	$2,901,000 to $2,185,000
Secondary Effects					
Increased Jobs from Payment Spending***	6 to 10	9 to 14	8 to 12	4 to 5	27 to 40
Decreased Jobs tied to Production*	-13 to -19	-16 to -22	-16 to -20	-10 to -15	-55 to -76
Net change in Secondary Jobs****	-3 to -13	-2 to -13	-4 to -12	-5 to -11	-14 to -49
Value-added****	$72,000 to -$167,000	$136,000 to -$132,000	$231,000 to -$71,000	$107,000 to -$23,000	$546,000 to -$393,000

Notes: *Right-hand side (RHS) impact estimates include potential effects on livestock activity.

**On-farm employment is FTEs. Left-hand side (LHS) estimate is jobs on participating operations only (who would be compensated). RHS estimates include potential livestock effects.

***Low end of range if 60% spent locally, high end if 90% spent locally.

****RHS impacts on secondary jobs and value-added reflect low share of lease spending in basin and adverse impacts including livestock effects.

Although the findings for the Aggressive demand management scenario are similar to the Moderate scenario, but on a larger scale, the number of decreased jobs stands out under this scenario – shown in Figure ES-3. In particular, the difference between the low end of the range for on-farm/ranch job decreases and the high end of that range reflects the estimated number of on-ranch livestock jobs projected to be lost (337-260 = 77 jobs across Western Colorado). In

addition, the large number of secondary jobs projected to be lost due to decreases in production (236 to 331 jobs) is also notable, because the partly offsetting number of secondary jobs that might be added due to local spending of the participation payments may often be in different industries.

In general, we believe that the assumptions incorporated in this analysis – full fallowing of harvested acres and potential reductions in livestock production – could result in larger economic impacts than alternative strategies for reducing consumptive use such as split season fallowing. This alternative approach is a form of deficit irrigation that effectively increases the crop production efficiency from irrigation – meaning that the reduction in yield (in percentage terms) should be less than the reduction in consumptive use (also in percentage terms).

Throughout this study, stakeholders in each basin emphasized their concerns about potential impacts on return flows that are relied on by downstream irrigators and other users. This analysis assumes that return flow issues associated with demand management will be resolved – either through avoiding these issues or effectively mitigating them. If those issues cannot be avoided or mitigated, the adverse economic impacts from demand management could be substantially greater than the estimates described in this report.

Figure ES-3. Summary comparison of benefits and adverse impacts for the Aggressive demand management scenario

	River Basin				
	Colorado River	Gunnison	Southwest	Yampa/White	Western Colorado
Participating Acres	12,000	12,100	13,800	14,200	52,100
Percent of Irrigated	1-in-17	1-in-19	1-in-16	1-in-8	1-in-15
On-Farm/Ranch Effects					
Decrease in Production Output*	-$4,847,000 to -$7,795,000	-$5,574,000 to -$8,552,000	-$6,458,000 to -$8,515,000	-$6,334,000 to -$11,775,000	-$23,213,000 to -$36,637,000
Reduced On-Farm/Ranch Jobs**	-60 to -77	-60 to -77	-69 to -81	-71 to -102	-260 to -337
Annual DM Payments	$4,851,000	$6,005,000	$6,573,000	$6,524,000	$23,953,000
Payments vs. On-farm Value-added (net)*	$2,406,000 to $1,670,000	$3,424,000 to $2,734,000	$2,752,000 to $2,269,000	$3,166,000 to $1,890,000	$11,748,000 to $8,563,000
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Increased Jobs from Payment Spending***	23 to 34	28 to 43	29 to 44	29 to 43	109 to 164
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Net change in Secondary Jobs****	-12 to -45	-7 to -41	-14 to -46	-39 to -90	-72 to -222
Value-added****	$252,000 to -$590,000	$424,000 to -$416,000	$863,000 to -$267,000	$863,000 to -$189,000	$2,402,000 to -$1,462,000

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**On-farm employment is FTEs. Left-hand side (LHS) estimate is jobs on participating operations only (who would be compensated).

RHS estimates include potential livestock effects.

***Low end of range if 60% spent locally, high end if 90% spent locally.

****RHS impacts on secondary jobs and value-added reflect low share of lease spending in basin and adverse impacts including livestock effects.

Economic sustainability and program design considerations. During this study, the WBWG has raised the question of where a tipping point might be for Western Colorado agriculture and its agriculturally-focused communities. From the standpoint of sustainability, there could be more reason for concern at the local, community level, than at the regional level across Western

Colorado. The bottom line is that the location and concentration of reductions in agricultural production matters. Even under the smaller, Moderate demand management scenario, the total number of acres assumed to be fallowed across Western Colorado (about 12,700 acres) would be more than the total number of irrigated acres in Eagle County or Dolores County, for example.

From the standpoint of Western Colorado as a whole, a demand management program involving up to four to five percent of the irrigated forage acres in Western Colorado (about 30,000 acres or 60,000 acre-feet per year) would be within the range of historical variability in hay production and could be economically manageable if:

- Participation and impacts were widely distributed among and within the four Western Colorado basins;
- Frequency and duration of participation was limited to avoid demand management becoming an irrigated land retirement program;
- The program provided the opportunity for participants to opt out under exceptionally dry conditions like 2002, 2012 and 2018; and
- The program offered opportunities for split season fallowing or other forms of deficit irrigation which could reduce impacts and costs.

Water conservation payments to Colorado ranchers could top $120M; is it enough?

by **Jerd Smith** | Sep 30, 2020 | **Climate and Drought**, **Colorado River**, **Conservation and Efficiency**, **Economics and Finance**, **Water Supply** |

Colorado River on the West Slope. Credit: Kevin Maloney

With another drought year draining the Colorado River system, a new economic study suggests that a wide-scale water conservation program in Colorado to reduce stress on the river could cost more than $120 million, depending on the amount of water saved for use in the program.

The study

(https://www.coloradoriverdistrict.org/wp-content/uploads/2020/09/upper-basin-demand-management-economic-study-in-western-colorado_corrected-09272020.pdf)

examined how much money it would take to adequately compensate ranchers and farmers who agree to temporarily remove water from Colorado's West Slope hay meadows and corn fields using a practice known as fallowing. It also looked at how such a conservation program would affect the farm economy and the communities and workers who rely on it for jobs.

“Potentially the program could be beneficial to the participants,” said BBC Managing Director Douglas Jeavens, a principal with BBC Consulting, which conducted the work. “The payments have to be large enough to offset any losses,” he said.

The water saved would go into a special drought pool in Lake Powell. The pool is envisioned as a way for Colorado and other states in the Colorado River Basin’s Upper Basin—Wyoming, Utah and New Mexico—to further protect their ability to use the river’s water even as Lake Powell continues to shrink.

Kathleen Curry, a former lawmaker and rancher in the Gunnison River Basin, said the analysis covered all the variables at play.

“I thought they did a good job,” she said. “The numbers they came up with are reasonable.”

The study looked at two different scenarios. Under a moderate scenario it examined the impact of fallowing 25,000 acres of West Slope land annually over five years, and an aggressive scenario under which 100,000 acres of land would be fallowed for the same period of time.

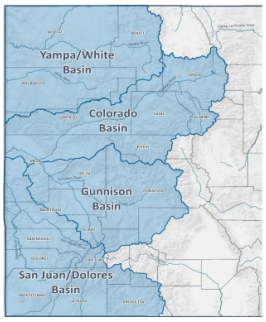
The study, released Sept. 25, was sponsored by the Glenwood Springs-based Colorado River District, the Durango-based Southwestern Water Conservation District, and Tri-State Generation and Transmission. It adds important new detail to a statewide discussion about whether Colorado should participate in the drought pool.

Since the state began studying the pool’s feasibility in 2019, West Slope ranchers have said repeatedly that they can’t make a decision about whether to participate if they don’t know how much money they would be paid and how such a program would affect the local economy.

The study provides some preliminary answers.

Across the Yampa, Colorado, Gunnison and Dolores river basins, under the moderate scenario, ranchers would see a net benefit of nearly $9 million, while under the aggressive scenario, the net benefit would rise to $36 million over a five-year period. The water in the study was priced in a range starting at $194 an acre-foot and rising to $263 an acre-foot.

Individual ranchers who agree to fallow 100 acres of land could see an annual benefit, after expenses, of more than $50,000 under at least two scenarios, according to BBC's analysis.



The Colorado, Yampa/White, Gunnison and Southwest basins were evaluated for secondary impacts of a demand management program that eventually could include the entire state. Source: Colorado River District

In modeling changes to the economy, the study found that 55 jobs would be lost under the moderate scenario, while 236 jobs would be lost under the aggressive scenario.

It also found that hay prices would rise 6 percent as supplies tighten and livestock populations would shrink by 2 percent.

Another key concern for ranchers and others is whether taking water off the fields could harm other water users on the river farther downstream.

"This is a critical issue," said Jeavens. "But we think looking ahead we could design a program that either reduces or eliminates that risk."

The pool would be filled with 500,000 acre-feet of water, roughly half of which would likely come from Colorado, should it, along with Wyoming, Utah and New Mexico, agree that filling the drought pool is doable.

Under a broader statewide study also underway, ranchers and cities would be asked to voluntarily set aside water for the drought pool and would be paid for whatever water they contributed to the program.

The Colorado Water Conservation Board, which is conducting the statewide feasibility analysis, declined to comment on the West Slope economic study.

Whether Colorado's Front Range will embark on a similar study focusing on its contributions to the conservation program isn't clear yet.

Previously Front Range cities have said they would be willing to contribute whatever water and/or cash is necessary to fill the drought pool in a way that is fair to cities and agricultural producers, as well as to different regions of the state.

The Colorado River, which starts high in Rocky Mountain National Park, supplies roughly half of the drinking water on the Front Range and is also used to irrigate millions of acres of hay meadows, corn fields and other crops on both the West Slope and Eastern Plains.

But if the drought-stressed river continues its decline, it could feasibly trigger involuntary cutbacks under the Colorado River Compact for the Upper Basin states, affecting both Colorado's West Slope and Front Range.

Though such a scenario is still considered unlikely, policy makers and others want to see Colorado develop some kind of insurance against such a catastrophic event.

Who would pay for the conservation program remains to be decided. Some have suggested that thirsty state's in the Colorado River's Lower Basin—California, Nevada and Arizona—ante up any needed cash. Others believe that a new set of fees or taxes could fund the ambitious effort.

Don Schwindt, a rancher who sits on the board of the Southwestern Water Conservation District, said the study is a good step forward, but he wants more detailed analyses.

"These numbers are as good as any that have been generated. But the simple answer right now is that this is not enough money to generate the water. For my operation, I have to have a higher dollar than those averages or I am going to go broke.

“We’ve moved forward,” he said, “but we don’t have anything we can take to the bank yet.”

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(https://www.watereducationcolorado.org/wp-content/uploads/2020/02/WEco-Fresh-Water-News-Editorial-Policy.pdf)

Related Coverage

Study on potential cutbacks in Colorado River water due in January
(https://www.watereducationcolorado.org/fresh-water-news/study-on-potential-cutbacks-in-colorado-river-water-due-in-january/)
November 19, 2018

Colorado and its fractious water users sign off on Colorado River drought plan in closely watched vote
(https://www.watereducationcolorado.org/fresh-water-news/colorado-and-its-fractious-water-users-sign-off-on-colorado-river-drought-plan-in-closely-watched-vote/)
November 16, 2018

THE SOUTHWESTERN WATER CONSERVATION DISTRICT
Developing and Conserving the Waters of the
SAN JUAN AND DOLORES RIVERS AND THEIR TRIBUTARIES
IN SOUTHWESTERN COLORADO
West Building – 841 East Second Avenue
DURANGO, COLORADO 81301
(970) 247-1302

August 28, 2020

CWCB Board Members
Director Mitchell
Colorado Water Conservation Board
1313 Sherman Street, Room 718
Denver, CO 80203

Re: Demand Management Feasibility Investigation Progress Report

Dear CWCB Board Members and Director Mitchell:

I am writing on behalf of the Southwestern Water Conservation District ("SWCD") and with regard to the Demand Management Feasibility Investigation Update Report presented at the Colorado Water Conservation Board's July meeting. SWCD appreciates your staff's time and dedication to facilitating the CWCB demand management workgroups over this past year and, more recently, to creating this very detailed report. SWCD looks forward to providing feedback on the report. However, we are unable to do so by the requested deadline because there has not been sufficient time for SWCD's Board of Directors and interested members of the public to review and collectively discuss their questions and perspectives on the report. SWCD intends to have that discussion at its next regular meeting, which is in the middle of October. SWCD will prepare and submit any written comments shortly thereafter.

Sincerely,

Robert Wolff
Board President
(970) 247-1302

SOUTHWESTERN WATER CONSERVATION DISTRICT
DRAFT 2021 BUDGET
BUDGET DETAIL VERSION 10-5-2020

	ACTUAL 2019	ADOPTED BUDGET 2020	YEAR TO DATE 09/30/20	ESTIMATED YEAR END 2020	DRAFT BUDGET 2021	NOTES
Beginning Fund Balance	**2,829,216**	**3,116,867**	**3,244,629**	**3,244,629**	**3,814,454**	
Revenues						
Property Tax	1,539,766	1,620,102	1,571,179	1,620,102	1,620,102	Preliminary estimate available October 13th
Specific Ownership Tax	148,587	100,000	96,252	115,000	100,000	2021 mill levy TBD (.403 in 2020, .407 in 2019)
Interest, PILT & Other Tax Revenue	43,078	35,500	37,784	40,000	35,500	2021 Total AV TBD
Other Income	218,889	172,679	157,291	172,511	162,998	($4,020,104,741 in 2020, $3,822,849,358 in 2019)
Interest Earned	41,066	40,000	46,031	60,000	40,000	Investment interest
Loan Interest	408	275	275	275	139	Bauer Lake loan, final payment 2021
Miscellaneous	10,641	5,000	4,731	4,800	5,000	CWCB reimbursement of Roundtable recorder duties
Water Seminar Registration	6,346	6,000	0	0	6,000	
ALP/ WIP Cost Sharing	9,749	200	70	100	200	
ALP Cost Sharing - Wages	29,633	0	0	0	0	
San Juan Recovery Program Water User Cmt	50,873	50,873	50,873	50,873	50,873	TBD, final 2021 committee budget
Stream Gaging Reimbursement	25,706	32,481	18,613	18,613	23,185	Conservative estimate, may acquire other partners in 2021
Water Information Program	44,467	37,850	36,698	37,850	37,600	
TOTAL REVENUES	1,950,320	1,928,281	1,862,506	1,947,613	1,918,600	
TOTAL RESOURCES	**4,779,536**	**5,045,148**	**5,107,135**	**5,192,242**	**5,733,053**	
Expenses						
Water Management & Development	381,277	1,564,440	317,446	467,638	814,371	
SWCD Grant Program	113,828	400,000	230,396	266,198	400,000	
Previously Committed Grants	114,999	85,694	0	34,694	185,625	
Fort Lewis College Water Action Plan					4,493	*remaining amount to bill off grant
High Desert Conservation District (2018 - Extension Approval Pending)					5,056	
Hermosa Company Ditch (2018 - Extension Approval Pending)					6,400	
La Plata Water Conservancy District (2018 - Extension Approval Pending)					11,238	
Mancos Conservation District					7,437	*remaining amount to bill off grant
Redmesa Reservoir & Ditch Company					75,000	
Southwest Conservation Corps (Dolores RRP)					25,000	
Town of Ophir (2018 - Extension Approval Pending)					51,000	
Project Reserve Fund	-	350,000	-	-	-	
San Juan Recovery Program Water User Cmt	102,130	101,746	58,710	101,746	101,746	
SWCD Project Water Rights	-	10,000	-	-	10,000	
Weather Modification (SW Colorado)	50,320	117,000	28,340	65,000	117,000	Includes $27,000 cost share on remote generator 2020 and 2021
Emergency Contingency Reserve Fund	-	500,000	-	-	-	
Data Collection	102,715	141,140	43,179	115,780	146,022	
Center for Snow & Avalanche Studies	5,000	7,000	7,000	7,000	7,000	
Stream Gaging/Federal	88,315	108,500	26,979	93,140	113,382	$94,146+$1,736 Slick Rock (2021 $17,500 new gage installation TBD)
Stream Gaging/Colorado	2,400	2,640	-	2,640	2,640	

	ACTUAL 2019	ADOPTED BUDGET 2020	YEAR TO DATE 09/30/20	ESTIMATED YEAR END 2020	DRAFT BUDGET 2021	NOTES
Water Quality Studies	7,000	13,000	9,200	13,000	13,000	CPW/CDPHE mercury testing, San Miguel Watershed Coalition & Pine River Watershed Group
Southwestern Colorado Permanent Radar	-	10,000	-	-	10,000	
Ongoing Organizational Support	55,881	60,850	49,879	56,379	43,350	
Event Sponsorships	4,581	6,000	1,000	1,000	6,000	
Western Water Futures Games (Gunnison)	-	1,500	-	-	1,500	Sponsorship of FLC team
Ditch & Reservoir Co. Alliance Conf.	500	500	500	500	500	
Other Requests	4,081	4,000	500	500	4,000	2020: FLC Event, NWRA Table Talks
Dues & Memberships	19,300	22,350	22,879	22,879	22,350	
Club 20	300	300	300	300	300	
CO River Water Users Assn	60	100	-	-	100	
CO Water Congress	8,052	10,000	11,293	11,293	10,000	Includes WOTUS amicus brief
Ditch & Reservoir Co. Alliance	250	250	250	250	250	
Family Farm Alliance	9,300	9,300	9,300	9,300	9,300	
National Young Farmers Coalition (Local)	100	500	500	500	500	
Special Districts Assn	1,238	1,400	1,236	1,236	1,400	
Other Requests	-	500	-	-	500	
Bonita Peak Community Advisory Group	5,000	5,000	5,000	5,000	5,000	
Water Bank Working Group	17,000	17,500	11,000	17,500	-	
Demo CSU Farm/Water Efficiency	10,000	10,000	10,000	10,000	10,000	
Water Education	107,865	121,095	64,239	93,733	122,795	
Water Info Program	65,239	72,095	42,601	72,095	72,295	2021 SWCD match $35,400
Water Seminar	15,260	18,000	880	880	18,000	
Water Education Colorado	10,000	10,500	10,500	10,500	11,000	
Water Leader Program Scholarship	3,250	5,000	3,500	3,500	5,000	
Water Festival	8,116	9,500	758	758	10,500	2021 intern, improved handouts
Watershed Education Program	6,000	6,000	6,000	6,000	6,000	San Miguel Basin
Technical Support	410,593	415,500	264,940	309,000	415,500	
Attorney Fees/General Counsel	222,182	140,000	120,557	140,000	140,000	
Attorney Travel Exps/General Counsel	18,587	15,000	1,152	1,500	15,000	
Litigation/General Counsel	19,160	30,000	27,962	20,000	30,000	
Colorado River Litigation/General Counsel	-	40,000	-	-	40,000	
Attorney Fees/Special Counsel	8,854	10,000	28,381	30,000	10,000	Peggy Montano, Michelle Magruder
Attorney Exps/Special Counsel	68	5,000	-	1,000	5,000	
Lobbying Fees	50,000	50,000	49,750	50,000	50,000	TBD increase for state lobbyist
Lobbying Expenses	1,469	5,500	708	1,500	5,500	TBD increase for state lobbyist
Engineering Fees/ General	45,600	45,000	22,711	45,000	45,000	Carrie Padgett
Engineering Fees/Special Projects	44,673	25,000	-	-	25,000	2020: Pete Foster
Technical Other Expenses	-	50,000	13,719	20,000	50,000	Colorado River modeling, Chris Treese (2020)
District Staff	187,755	272,629	141,164	169,274	202,302	
Wages - Executive Director	94,295	146,450	71,794	71,794	-	
Wages - General Manager	-	-	-	-	100,000	
Wages - Programs Coordinator	49,956	50,393	37,533	51,500	50,393	$24.23/hour for estimated 2,080 hours
Wages - Payroll Taxes	11,468	17,716	8,778	15,500	13,535	
Wages - Retirement Benefit	5,795	11,811	5,187	8,913	9,024	TBD 6% employer match
Wages - Health & Life Insurance	26,241	46,260	17,872	21,567	29,350	TBD personnel committee recommendation at October meeting

	ACTUAL 2019	ADOPTED BUDGET 2020	YEAR TO DATE 09/30/20	ESTIMATED YEAR END 2020	DRAFT BUDGET 2021	NOTES
Bonus - Executive Director or General Manager	-	-	-	-	-	
Bonus - Programs Coordinator	-	-	-	-	-	
Meetings & Travel	75,993	105,500	34,966	38,500	83,500	
Director Fees	17,400	21,000	13,975	16,000	20,000	
Director Travel	22,843	31,000	5,383	5,500	30,000	
Registration Fees	6,116	8,500	6,293	7,000	8,500	
Meeting Expenses	10,337	10,000	1,165	1,500	5,000	
Staff Travel	19,297	35,000	8,150	8,500	20,000	
Administration	61,229	80,296	66,488	74,816	75,912	
Audit	8,200	8,400	8,200	8,200	8,600	
Accounting	28	500	2,120	3,000	5,000	Bill.com, QB, etc $2000, FZA $2,000-$2,500 annually
Capital Outlay	3,718	15,000	15,260	15,260	5,000	2020: Conference room A/V upgrade, 2021 upgrade office artwork $3,000, new GM computer $1,
Casual Labor	90	200	-	200	200	
Manager's Discretionary Budget	-	2,000	759	759	2,000	
Equipment Leasing	1,800	1,800	1,350	1,800	1,800	
Insurance - General Liability	6,384	6,000	6,734	6,734	7,300	
Legal Notice	276	600	43	500	600	
Miscellaneous Exps	290	500	97	500	500	
Office Exps	7,987	7,500	3,762	4,000	6,000	*Reallocation of accounting exps to the Accounting line item
Postage	942	1,000	1,268	1,500	1,500	Increase for faster delivery, later distribution date
Rent	29,063	30,796	24,525	29,063	31,412	2% contractual increase
Staff Training & Professional Development	-	2,500	-	-	2,500	
Telecommunications	2,451	3,500	2,371	3,300	3,500	Includes Spectrum, Zoom, Verizon (desk & cell phones), Website
County Treasurer Fees	45,302	52,668	46,021	52,668	52,668	
TOTAL OPERATING EXPENSES	**1,428,610**	**2,814,118**	**1,028,323**	**1,377,788**	**1,956,419**	
TABOR Contingency Reserve	-	84,424	-	-	58,693	3% of total budgeted expenses
Emergency Contingency Reserve	-	96,414	-	-	95,930	5% of total budgeted revenues
TOTAL APPROPRIATED FUNDS	**1,428,610**	**2,994,956**	**1,028,323**	**1,377,788**	**2,111,042**	
Excess Revenue Over (Under) Expenses	**521,710**	**(1,066,675)**	**834,183**	**569,825**	**(192,442)**	
ENDING FUND BALANCE	**3,350,927**	**2,050,192**	**4,078,812**	**3,814,454**	**3,622,011**	

	SWCD Project Reserve Fund *(fund created in fall 2018)*	SWCD Emergency Contingency Reserve Fund *(fund created in fall 2019)*
12/31/2017 Balance	**$135,365.79**	**$12,671.35**
2018 Interest Income	$3,816.52	$281.35
2018 Investment 06/08/2018	$60,000.00	$0.00
2018 Budgeted Investment 12/31/2018	$350,000.00	$0.00
2018 Grant Program Unused 12/31/2018	$240,697.00	$0.00
12/31/2018 Balance	**$789,879.31**	**$12,952.70**
2019 Interest Income 12/31/2019	$16,086.56	$263.90
2019 Budgeted Investment 12/31/2019	$350,000	$500,000
2019 Grant Program Unused 12/31/2019	$285,401	$0
12/31/2019 Balance	**$1,441,366.87**	**$513,216.60**
Projected 12/31/20 Interest Income	$40,000.00	$13,000.00
2020 Budgeted Investment 12/31/2020	$350,000.00	$500,000.00
2020 Grant Program Unused 12/31/2020	$58,802.00	$0.00
Projected 12/31/20 Balance based on Budget	**$1,890,168.87**	**$1,026,216.60**

Total Cash Assets as of August 31, 2020	$	4,093,865.00
Total in Reserve Funds as of December 31, 2020	$	2,916,385.47
Projected Remaining Undesignated Cash for 2021	$	1,177,479.53

Southwestern Water Conservation District
Budget Process

This schedule and procedure abides by requirements of Local Government Budget Law and procedures recommended by the Colorado Department of Local Affairs (DOLA).

1. **August board meeting:** Board appoints a budget officer (typically the executive director) and reviews goals and activities. Budget Officer presents draft of goals and activities for the coming year to the board for discussion, prioritizing, and preliminary approval.

2. **September budget workshop:** Between the August board meeting and the September budget workshop, Budget Officer works with the Secretary-Treasurer to develop a draft budget based on goals for the coming year. Initial draft budget presented to the board by Budget Officer (statutory deadline is October 15). Budget Officer advises board of Assessors' estimates of assessed values. Board discusses draft budget and directs staff to make any agreed-upon changes.

3. **October board meeting:** The Board will review the revised budget, including September changes, and the draft budget message. *The Board will endeavor to have the draft budget substantially complete as a result of discussion at the October meeting.* After October 15th, this draft budget will be available for public inspection. Notice that the draft budget is available for inspection, as well as the date of the December public budget hearing, will be published.

4. **December board meeting:** Board conducts public hearing on the proposed budget. Following the public hearing, the board may revise the proposed budget in response to public comment and as otherwise allowed by state statute. Board adopts the budget based on final assessed valuations and sets the mill levy based upon receipt of final assessed valuations from the nine counties by the statutory deadline (December 10). Budget Officer certifies the mill levy to the County Commissioners by the statutory deadline (December 15).

5. **Prior to January 31:** Budget Officer files the budget, budget message, related resolutions, and mill levy certifications with DOLA prior to deadline (January 31). SWCD's adopted budget is then publicly available on the DOLA Local Government Information System.

Adopted by motion on October 31, 2019 to be effective for the 2021 budget and all future years until specifically modified by board action.

HARRIS WATER ENGINEERING, INC.
954 EAST SECOND AVENUE, #202
DURANGO, COLORADO 81301
970-259-5322
carrie@durangowater.com

Memorandum
October 5, 2020

To: SWCD Board of Directors
From: Carrie Padgett
Subject: Engineering Report for the October 13 and 14, 2020 Board Meeting

The following is a summary of the topics Carrie Padgett worked on for SWCD since the last Board meeting, during the months of August and September 2020. For more background and detail please contact me.

San Juan and Upper Basin Endangered Fish Recovery Programs

The fall time frame is typically when a lot of program activities occur, so fewer meetings are held by the committees. I attended a hydrology meeting for the program in late September and participated in two Upper Basin Executive Committee conference calls. I have included in the board packet annual program report.

A Water Development Steering Committee meeting will be held tomorrow. As you may recall, water development interests' contract with Tom Pitts and Tom Wesche for representation on the SJRIP committees. Tom Wesche will announce his retirement from the Biology Committee tomorrow on our call. Tom will be recommending to the committee that I replace him as the water development interests' representative on the Biology Committee. I am overly excited for this opportunity and hope the committee supports Tom's recommendations. I will provide the board an update on the outcomes of the meeting during the board meeting.

Navajo Reservoir Operations

The quarterly operations meeting was cancelled in August due to pandemic.

Water Bank

I have participated in a few Water Bank Work Group activities since my last update. I attended multiple webinars specific to reviewing and understanding the draft secondary impact study in August and September. The final report of the study may be found on the WBWG's website (or feel free to email for a copy). I have included in the board packet a copy of the fact sheet summarizing the study and the executive summary. I look forward to the presentation at the upcoming meeting and welcome any comments at that time.

The group has had one webinar to talk about next steps now that the study is complete. Additional outreach will be occurring surrounding the study through the end of the year (i.e. presentations for WBWG members, Roundtables, stakeholders, etc…). The group has decided to take a break on pursuing anything until further recommendations are made by CWCB regarding Demand

Management. We plan to meet again in December (or later) to discuss potential ideas of new projects or other areas our group's collective knowledge would be welcomed.

Paradox Salinity Project

No activities occurred specific to the draft EIS during this time period. I do not have any new updates on the draft EIS process.

Animas Watershed Partnership (AWP)

We had our monthly webinar steering committee on July 9 for AWP. At this meeting, Warren provide a progress report on his GIS work for the Florida River Assessment. The group brainstormed funding ideas, outreach opportunities, and provided partner updates. The steering committee will continue to host monthly webinars for Warren to provide progress on his grant work and provide updates to the committee.

Demand Management Workgroup

I participated in the CWCB Demand Management workshop held in early September. This was an all-day workshop reviewing outcomes from each workgroup and work conducted by CWCB's contractor to help better "unpack" Demand Management. Some of my key takeaways from that meeting were:

- The cost of the program is heavily tied to the program's structure and time frame. Depending on the funding source, the benefits of the program may change as well as the cost of the program.
- The source of funding may affect if the program has an economic benefit to Colorado or not. Funds outside of the state would show a positive impact where funds coming from the state would show a neutral or even negative impact.
- Tension exists between a program that is both equitable and voluntary. While an ideal program would like to avoid disproportionate impacts, how do you still make it voluntary but not too restrictive to prevent these types of impacts.
- As always, the work has answered some questions but also lead to many more that would need to be answered before a program is implemented.

Water Rights

I assisted Beth and Laura on several water right cases. I aided by reviewing applications, preparing, and reviewing exhibits. For further details, please contact me or Beth.

swimming upstream

Field Report 2020

San Juan River Basin Recovery Implementation Program
Upper Colorado River Endangered Fish Recovery Program

Download our digital edition at
www.coloradoriverrecovery.org
www.gov/southwest/sjrip

Desolation Canyon on the Green River

In this issue

COVER PHOTO BY M. TILDON JONES, USFWS

swimming upstream

Swimming Upstream is a publication of the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program. These programs are national models of cost-effective public and private partnerships. The programs are working to recover endangered fishes while water development continues in accordance with federal and state laws and interstate compacts, including fulfillment of federal trust responsibilities to American Indian tribes.

Melanie Fischer • Julie Stahli
Melissa Mata
Co-editors

UPPER COLORADO RIVER ENDANGERED FISH RECOVERY PROGRAM (UPPER COLORADO PROGRAM)
U.S. Fish and Wildlife Service
P.O. Box 25486, DFC
Lakewood, CO 80225
(303) 236-9881 Phone
(303) 236-8739 Fax
ColoradoRiverRecovery.org

THOMAS E. CHART
Program Director

PROGRAM PARTNERS
Bureau of Reclamation
Colorado River Energy Distributors Association
Colorado Water Congress
National Park Service
The Nature Conservancy
State of Colorado
State of Utah
State of Wyoming
U.S. Fish and Wildlife Service
Utah Water Users Association
Western Area Power Administration
Western Resource Advocates
Wyoming Water Association

SAN JUAN RIVER BASIN RECOVERY IMPLEMENTATION PROGRAM (SAN JUAN PROGRAM)
2105 Osuna Road, NE
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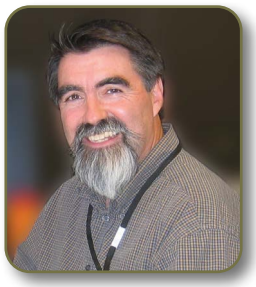
(505) 346-2542 Fax
southwest.fws.gov/sjrip

MELISSA MATA
Program Coordinator

PROGRAM PARTNERS
Bureau of Indian Affairs
Bureau of Land Management
Bureau of Reclamation
Jicarilla Apache Nation
Navajo Nation
State of Colorado
State of New Mexico
Southern Ute Indian Tribe
The Nature Conservancy
Ute Mountain Ute Tribe
U.S. Fish and Wildlife Service
Water Development Interests

Program Director's Message

By **Tom Chart,** *Program Director, Upper Colorado Program*



It's mid-April, 2020. I am drafting this note while sitting at my telework station in our spare bedroom in our home in Evergreen, Colorado. We are entering our second month of staying at home as dictated or advised by our community leaders in response to the pandemic. COVID-19 rages on in various parts of our country and around the world with some early indications we may be "flattening the curve" here in Colorado—maybe? From conversations with many of you, it seems we all are generally rolling with the cards this virus has dealt us. We are adjusting to the new norm of maintaining physical distance from each other, conducting even more conference calls (didn't seem possible) and video meetups, and younger parents are balancing their work load against homeschooling their children. I wish the best to you and your loved ones—it seems we will be dealing with this for quite some time.

As we look toward our Post-2023 future, we, as stakeholders in the Upper Colorado and San Juan river recovery programs, are dealing with our own particular flavor of uncertainty. Can we secure funding to keep these collaborative partnerships moving toward species recovery at a reasonable pace? The current proposals to downlist humpback chub and razorback sucker are tangible signs of progress, but they also provide important perspective to us in our role as big river conservationists. The proposals to change the listing status of these two species clearly recognize the importance of sustained management (e.g. of flows, habitat, fish ladders and screens, captive populations of endangered fish, and control of invasive species) in a highly regulated river system like the Colorado River. To date, Congress has demonstrated bi-partisan support of our chosen brand of Endangered Species Act implementation; one in which we have spread the costs of mitigating the effects of water depletions as broadly and painlessly as possible. The result has been a collective and synergistic approach to ecosystem conservation that far outweighs what we could have accomplished with project by project depletion impact mitigation. We will come up with a Post-2023 solution, and along the way will hopefully get closer to describing what Colorado River conservation will look like in the very long term.

More immediately, project leaders busy themselves with packing bearings on boat trailers, tuning up boat motors, repairing nets, and applying new data analyses to old data sets. Of course, they would rather be netting northern pike in Yampa River backwaters before they spawn or looking for juvenile razorback sucker on the San Juan River. But they are scientists who respect the value of the best available information.

Tom Chart

The Green River Canal Fish Screen: From Entrainment to Freedom for Endangered Fish

By **Dave Speas**, *U.S. Bureau of Reclamation (USBR)*

People across the basin use water from natural rivers to irrigate crops, create electricity and to provide water to homes and businesses. When canals are not screened, fish can enter canals along with water that is being diverted. Entrainment of fish in irrigation canals is problematic for populations of endangered species. For many years, the Green River Canal near Green River, UT was no exception, as nothing stood between endangered fish entering the canal and ending up on a farmer's field.

The Green River Canal originates about a half-mile below the historic Tusher Wash diversion dam, which diverts about 700 cubic feet per second (cfs) from the Green River year-round (*Figure 1*). Most of this water (600 cfs) passes through a small, partially screened power plant and back to the river. About 80 cfs enters the Green River Canal, mostly for agricultural purposes. The canal flows about eight miles toward the town of Green River and feeds many lateral canals along the way, irrigating the community's renowned melon crops.

In 2012, the Upper Colorado Program installed a passive-integrated-transponder (PIT) array near the top of the canal to figure out how many fish were being entrained. The results were striking. In 2013, almost 700 endangered fish, representing all four species, were detected entering the canal. In fact, 301 razorback sucker became entrained in a single day. In subsequent years, entrainment rates reduced as flow rates increased, but remained at alarming levels through 2018.

As the search for a solution to the entrainment problem became more and more urgent, engineers became focused on a solution installed in New Mexico in 2014. The Hogback Diversion weir wall on the San Juan River near Shiprock is a 550'-long concrete wall which runs at a shallow angle from one bank of the Hogback Canal to the other. Operation is simple: a few inches of water flows over the crest of the weir wall and into the canal. Because these endangered fish swim close to the bottom, most follow the bottom of the wall until they end up back in the river. Fish could also swim back upstream and out the way they came in.

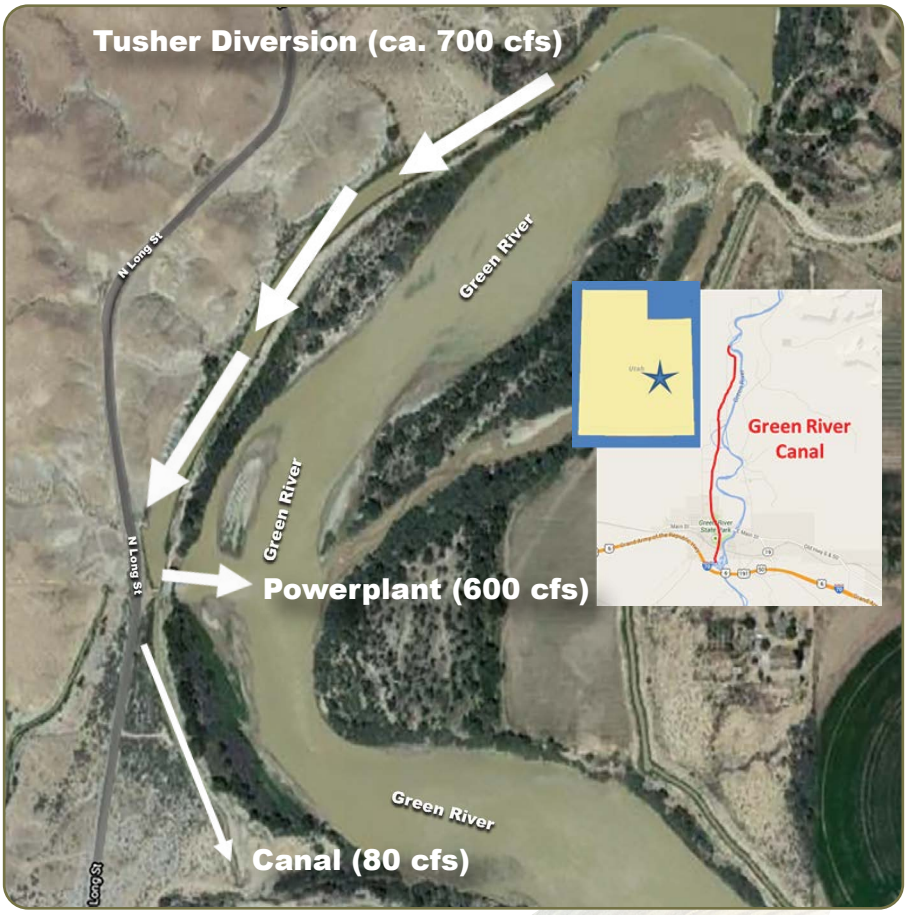


PHOTO BY USBR

Figure 1. Location and layout of the Green River Canal near Green River, UT, prior to construction of the Green River Canal in 2019. River and canal flow direction is from top to bottom.

The Hogback weir kept 89% of fish out of the canal; only a few fish passed over the wall. Engineers thought they could improve the screen by adding something to the crest of the wall. The final design included horizontal screen panels attached to the downstream edge the weir wall (*Figure 2*). About 90% of the water flowing over the wall falls through thousands of tiny holes punched in the panels, and flows into the canal. The other 10% of the water--and anything in it, like fish—continues to flow over the panel and falls off the edge into a return channel. Like the Hogback Diversion, fish who don't try to jump over the weir wall would have the option of moving downstream and back to the river through the return channel, or swim back out the top of the canal; importantly, though, any fish jumping over the wall would return to the river rather than entering the canal.

The Green River Canal screen was completed prior to the 2019 irrigation season. The new canal screen included several antennas to detect PIT-tagged fish entrained in the canal. During the irrigation season, 1,007 PIT-tagged fish visited the canal above the screen, comprised mostly of razorback sucker and bonytail. Of these fish, 545 exited the canal via the fish return channel, and the remainder presumably exited the area through the canal head gates a few hundred feet upstream. Most

Continued on page 4

The Green River Canal Fish Screen: From Entrainment to Freedom for Endangered Fish, *continued from page 3*

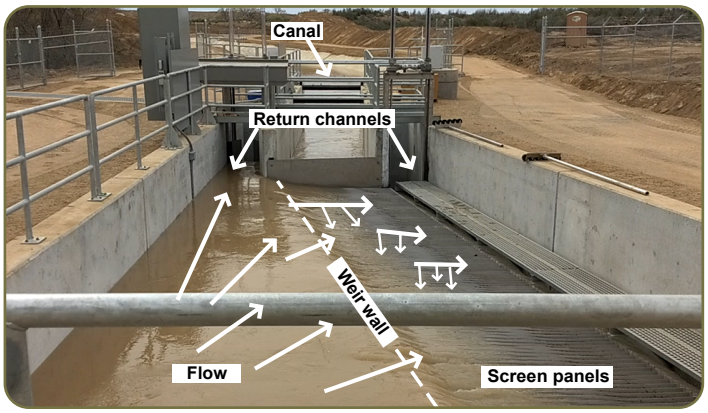


PHOTO BY USBR

Figure 2. Green River Canal fish screen in operation, looking downstream. Water flows across the screen panels from left to right; about 90% falls through the screen to the canal but 10% (and fish) flows into one of two return channels back to the Green River. Photo courtesy Ryan Christianson, USBR.

importantly, no fish were detected on the PIT antennas below the canal screen, suggesting a 100% success rate of the new screen design.

At present, endangered fish are no longer in danger of entering the Green River Canal and the canal company continues to receive water that is now free of large woody debris, which the Upper Colorado Program participants and partners can be proud of. This success story is the product of persistent efforts on the part of coordinators and committees, vital cooperation of the Green River Canal Company, some truly innovative and thoughtful hydraulic and structural engineers, and personnel, machinery, and materials supported by the Upper Colorado Program's capital construction fund. From an endangered fishes' perspective, these efforts proved to be worth every penny.

A Library of Fish in the Desert

By **Emily S. DeArmon and Steven P. Platania,** *Division of Fishes, Museum of Southwestern Biology (MSB), University of New Mexico*

June 1959 was memorable for 67 year old Milton Seibel of Arboles, Colorado. As that years' meager San Juan mountain snowmelt waned and daylight hours advanced towards their maximum, Seibel escaped his farm to partake in his favorite pastime. A few hours after settling along the bank of the San Juan River in pursuit of that which is elusive, Milton was rewarded with a 415 millimeter (mm) SL (16½ inches) male Colorado pikeminnow (MSB 3235) which he pulled from an expansive pool abutting the rocky bluff. The supersized minnow, called "salmon" by local residents, was caught at a popular fishing hole off old NM 362 (Rosa Road) about three miles downstream of the New Mexican pioneer village of Rosa. The unusual fish was proudly carried home by Mr. Seibel and carefully placed in his freezer to await the arrival of an honorable guest from Albuquerque.

About three months later, on Saturday August 29, 1959, Dr. William J. Koster, Ichthyologist and Curator of Vertebrates in the Department of Biology at the University of New Mexico, anxiously accompanied Mr. Seibel back to the Rosa fishing hole with hopes of catching lightning in a bottle. Defying seemingly overwhelming odds, Mr. Seibel proceeded to reel in another, even larger, Colorado pikeminnow (590 mm, 24¼ inches, female; MSB 3234; Figures 1 and 2) from the now infamous fishing hole. Less than 24 hours later, Dr. Koster was carefully ferrying both trophies back to Albuquerque, knowing he had acquired the first two Colorado pikeminnow from the San Juan River Basin.


PHOTO © W.J. KOSTER

Figure 2. The second Colorado pikeminnow, 590 mm SL, MSB 3234, caught on August 29 1959 in the San Juan River downstream of Rosa by Milton Seibel.


PHOTO © W.J. KOSTER

Figure 1. August, 29 1959, Milton Seibel holds his prize catch of a Colorado pikeminnow (MSB 3234) from the San Juan River downstream of Rosa.

Fast forward about forty years to the beginning of the new millennium. The Division of Fishes at the University of New Mexico that was created in 1939 by the late Dr. Koster is a well-established repository for fish from New Mexico and the American Southwest. Navajo Reservoir is nearing its fourth decade in operation and the San Juan River Basin Recovery Implementation Program is approaching its 10 year anniversary. Endangered Colorado pikeminnow and razorback sucker are routinely stocked in the San Juan River and the first wild spawning of razorback sucker has been documented (Figure 3). Larval and juvenile fish are now archived in the museum.

As the collection of fish tissue at the repository grows, so does the ability to address a suite of questions on the recovery of the endangered species. The first discovery occurred after a spate of developmental deformities were detected in the annual catch of larval San Juan River suckers (Figure 4). Biologists examined over 55,000 larval and early juvenile suckers from throughout the San Juan River to

Continued on page 5

PHOTO © BEN GOLDFARB

Figure 3. Larval fish collected from the San Juan River.

PHOTO © ASIR

Figure 4. Early juvenile San Juan River flannelmouth sucker displaying opercular deformities ranging from mild (bottom image) to severe (top image).

determine the frequency of the potentially lethal deformity. They discovered that the presence of the opercular deformity was significantly greater in razorback sucker than in the other two native suckers and forwarded museum material on to toxicologists and histologists for further investigation.

By 2017, the number of endangered fish present in the San Juan River resulted in a concurrent increase in the number of larval specimens collected annually. In 2018, a project was undertaken to determine the spawning periodicity of these two endangered fishes, their larval growth rates, and environmental factors correlated with spawning of these two species. Like the opercular deformity investigation, this study relied exclusively on material already available and permanently housed in the MSB Division of Fishes.

Researchers selected larval specimens from hundreds of samples containing the two endangered species taken from 2009 to 2017. One can determine the age of a fish by counting the number of rings present on the bones of the fish, just as in tree rings. The fish bones that provide the most reliable readings are those in its inner ear (=*otoliths; Figure* 5). In larval fish, researchers can see and count daily growth rings thereby determining a fish's age in days (*Figure* 6), when it spawned, and its larval rate of growth.

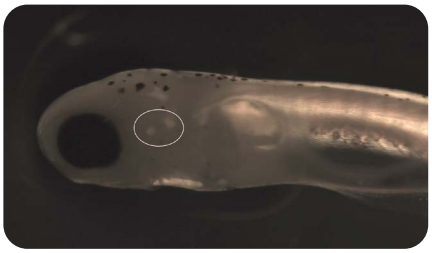


PHOTO © ASIR

Figure 5. Larval San Juan River sucker, 12 mm in length, with otoliths back-illuminated (two otoliths are located inside the white oblong sphere).

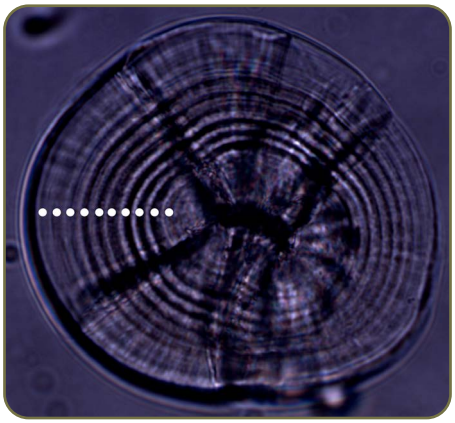


Figure 6. Image of one of the above otoliths showing daily growth rings. The white spots indicate the daily growth rings (n=10) deposited by this fish. Photo by ASIR

The larval fish showed correlations between spawning and discharge, slower growth rates for Colorado pikeminnow and razorback sucker than in the Green River, and that their spawning period is shorter than previously predicted; all important information related to the recovery of these two species.

Most recently, Tracy Diver, former U.S. Fish and Wildlife Service biologist, initiated a cutting-edge genetic study to determine the number of breeding Colorado pikeminnow and razorback sucker in the San Juan River. Using genetic information extracted from tissue samples of MSB larval Colorado pikeminnow and razorback sucker (2009–2018), Ms. Diver and her team documented annual variation in the number of spawning Colorado pikeminnow (3–50) and razorback sucker (65–109) as well as showed sibling relationships between individual specimens. They plan to expand this work to include larval endangered fish collected downstream of the Paiute Waterfalls and from the 2019 larval fish samples. These represent only a few of the museum based San Juan River projects that have occurred over the past decade. (*Figure 7*)

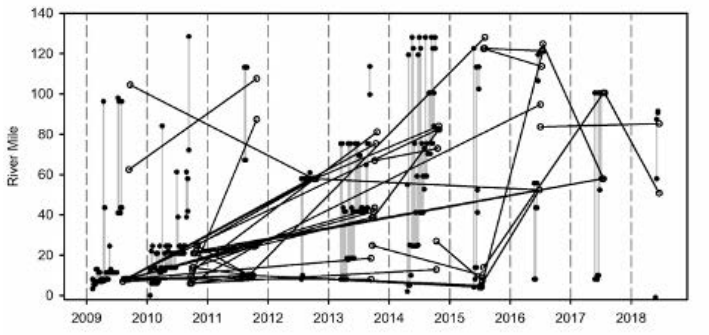


Figure 7. Predicted full-sibling relationships between pairs of larval razorback sucker collected between 2009 and 2018. Full-siblings over space and time are connected by grey lines (within year) and black lines (between years). Year of collection are separated by vertical dashed grey lines.

Sixty-some years after capture of the first Colorado pikeminnow in the San Juan River, the village of Rosa is submerged several fathoms under Navajo Reservoir and Mr. Seibel lay at rest on his 1919 homestead. While both the community where the fish were caught and the man who collected the fishes have been gone since 1963, MSB 3234 and 3235 persist, in nearly the same condition as 60 years earlier

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A Library of Fish in the Desert, *continued from page 5*

when catalogued into the burgeoning fish collection at the University of New Mexico (*Figure* 8). And since then, thousands of additional San Juan River fish samples, the products of a variety of recovery efforts, are neatly organized on the shelves in the Division of Fishes (*Figure* 9). Arranged like books in a library, they shelter irreplaceable information awaiting to be revealed by the next curious researcher who uncaps a jar. In the meantime, like library books, MSB 3234, 3235, and all subsequent San Juan River acquisitions will continue to be cared for, in perpetuity, at the University of New Mexico.

PHOTO © EMILY DEARMON

Figure 8. The two Colorado pikeminnow (A: MSB 3235 and B: MSB 3234) collected by Milton Seibel in 1959 as they appear in 2020.

PHOTO © EMILY DEARMON

Figure 9. The wet collection of the Division of Fishes at the MSB in 2020.

Record Number of Juvenile Razorback Sucker Captured in San Juan River

By **Ben Schleicher**, *USFWS*

PHOTO BY USFWS

In 2018, the San Juan River saw some of the lowest runoff in recent history, leading to low, warm and very clear summer base flow conditions. This proved to be ideal conditions for larval razorback sucker spawned in the wild to successfully survive and recruit to an older age class. A record number (n=164) early juvenile life stage razorback sucker were captured during summer sampling performed by American Southwest Ichthoyological Researchers (ASIR). Six young-of-year razorback sucker were then collected in the fall by New Mexico Department of Game and Fish (NMDGF). Interest created by these findings led to a sampling trip in spring 2019 to document over-winter survival of this 2018 cohort of wild razorback sucker.

Between 25 March and 4 April 2019, the San Juan River was sampled from Shiprock Bridge in NM River Mile (RM) 147.9 downstream to Clay Hills in UT (RM 2.9) using electrofishing rafts. The objective was to capture and identify wild-spawned razorback sucker early in the season, before these age-1 fish had grown significantly. It was thought that sampling efforts that occur later in the calendar year may have been unable to effectively distinguish these wild-produced, age-1 recruits from the smallest hatchery-reared razorback sucker stocked into the river early that fall [minimum stocking length = 300 mm total length (TL)] and that might have lost their passive integrated transponder (PIT) tag.

A total of 45 fish identified as wild age-1 razorback sucker were collected along with one identified as razorback sucker X flannelmouth sucker hybrid. These age-1 fish were collected from RM 119.0 downstream to RM 17.0 and varied from 100-197 mm TL. Of the 45 age-1 razorback sucker collected, 43 were PIT-tagged, the other two were too small to tag at time of capture. Two fish were recaptured during fall 2019 sampling efforts. One was a razorback sucker that grew 90 mm in seven months, the other was a fish originally identified as a razorback sucker in spring 2019, but after growing 115 mm in the seven months between captures, this fish was subsequently identified as a razorback sucker x flannelmouth sucker hybrid. We are hopeful that being able to collect and PIT-tag these young razorback sucker will allow us to examine over-winter survival rates, identify habitats utilized by this life stage of fish, and help us hone our identification skills to be able to more accurately find and correctly identify this rare life stage of endangered fish in the field.

Matheson Wetland Valuable Nursery Habitat

By **Zach Ahrens**, Utah Division of Wildlife Resources (*UDWR*)

All creatures need habitats in which to feed, grow, seek refuge and reproduce. Stream fishes like those of the Colorado River Basin require access to a variety of habitat types throughout their lives to achieve these life history events. Loss of such habitat is one of many threats facing native fishes of the Colorado River basin.

Studies have shown that floodplain wetland habitats—when kept free of exotic predator fishes—can be valuable nurseries for young razorback sucker to grow and survive their first year. Management of wetlands on the Green River, such as Utah's Stewart Lake, has demonstrated the potential for these habitats to help recover the razorback sucker and other endangered fishes. Delivery of water from Flaming Gorge Reservoir to the Green River, timed to mimic natural spring runoff, supports this management by carrying drifting larval suckers into off-channel refuge habitats. Similar facilities have not been developed on the Colorado, until now.

Matheson Preserve co-owners, UDWR and The Nature Conservancy, teamed up with the U.S. Bureau of Reclamation to help razorback sucker access this critical wetland area. During the 2018-2019 winter, the Preserve's largest wetland pond was deepened and reconnected to the Colorado River, providing access for razorback sucker. In 2019, screens—wide enough for tiny fish, but too tight for large predators to pass—were installed to provide a larval safe-haven. A flood gate was also installed to keep the wetland wet while baby suckers grow and to release the fish when their growing season ends each year.

Although the gate and screens were not installed until after runoff, biologists at UDWR were able to entrain larval razorback sucker into the wetland. The renovated river-floodplain connection helped bring water into the Preserve's often dry Central Pond again. The flooding created both open water and vegetated aquatic habitats critical to feeding and refuge for young suckers. Razorback sucker larvae were captured in the Preserve in the highest numbers observed since project planning began. In spring 2020, larval razorback sucker were entrained using the new infrastructure and are safely growing: a first for the Colorado River.

These preliminary successes highlight the exciting potential for razorback sucker recovery. With a little help from Mother Nature and a dedicated recovery team, wetlands of the Colorado may pitch in with those of the Green to help razorback sucker complete their life cycle in the wild once again.

PHOTOS BY ZACH AHRENS, UDWR

Update: Palisade High School Fish Hatchery Project

By **Michael Gross,** *USFWS*

The Palisade High School Fish Hatchery, in partnership with Ouray National Fish Hatchery-Grand Valley Unit (Ouray NFH-GVU), filled the newly constructed on-campus recirculating aquaculture system in June 2020 with plans to bring in 250 razorback sucker mid-July. These endangered fish will be raised by students and released into the upper Colorado River in late spring 2021, immediately boosting populations of the highly depleted species, all while giving young science-minded high school students the opportunity to practice hands-on fish culture.

Beginning in 2018, Palisade High School students raised an impressive $40,000 through various fundraisers and a slew of community donations to upgrade an old storage building at the edge of campus, equipping it with all the essentials needed to facilitate the indoor aquaculture operation. The aquaculture system itself was purchased by the Upper Colorado River Endangered Fish Recovery Program and Bureau of Reclamation, and consists of three 235 gallon circular tanks, dual bag filters, ultraviolet filter, auxiliary biofilter and a 150 gallon sump tank.

PHOTOS BY MICHAEL GROSS, USFWS

Palisade High School students will operate the facility with guidance from Ouray NFH-GVU personnel. This project will give students the opportunity to learn a wide array of topics including: raising endangered fish, recirculating aquaculture, ichthyology, fish biology and much more, helping to foster the next generation of fisheries scientists and aquaculturists. Congratulations to the Palisade High School students, School District 51 and the Grand Valley community for all of the incredible support to make this happen.

A Gauntlet of Mouths

By **Tildon Jones,** *Upper Colorado Program*

Nonnative fish introductions into river habitats are a major program concern, but many wonder why Program partners are so concerned about the addition of new species to our western rivers? The Colorado pikeminnow is the largest minnow species native to North America, and was historically the top predator in the Colorado River basin. How could such a large predator be impacted by new species of nonnative fish?

It starts when Colorado pikeminnow hatch from eggs. Newly hatched pikeminnow larvae are very small (about 1/2 inch long) and have not fully developed all their fins. As they drift down river to nursery habitats with slower currents, they are vulnerable to even small minnows that can eat the tiny larvae. Studies have confirmed that introduced bait fish like red shiner can consume pikeminnow larvae when they arrive in nursery backwaters.

As the larval pikeminnow grows and develops its full complement of fins, its swimming ability improves, but new predator species emerge as potential threats. Nonnative smallmouth bass spawn and hatch during a similar time in summer as Colorado pikeminnow, but their fry grow much more quickly. A smallmouth bass hatched on the same day as a Colorado pikeminnow can grow large enough to eat the pikeminnow in as little as two weeks. To make matters worse, the two species inhabit similar habitats in their first summer, so encounters are frequent.

After their first summer, pikeminnow are considered to be "juveniles" for the next several years, at a size of 4-15 inches. At this stage, they start to outgrow the size that smallmouth bass can fit into their mouth, and pikeminnow typically move downstream into lower river reaches. Unfortunately, the lower rivers have higher concentrations of a new predator—the walleye. Researchers have consistently documented pikeminnow in the stomachs of walleye in both the Green and Colorado rivers, and walleye are capable of consuming pikeminnow half their size.

Finally, upon reaching adult size (>18 inches) after seven or more years, the Colorado River's largest native fish is still vulnerable to a new nonnative predator often illegally introduced. Northern pike can reach lengths of more than 39 inches and at that size, they are capable of consuming small adult pikeminnow. With their large mouth and sharp teeth, northern pike are ambush predators that dash out from vegetated cover to grab other fish that swim by. Native fish in areas with high concentrations of northern pike have been captured with bite marks indicating an unsuccessful attack.

Because the Colorado pikeminnow were the primary predator species native to the basin, many native fishes, including pikeminnow, evolved to grow slowly and take advantage of different habitats than the adults. And because pikeminnow do not have teeth in their mouth, none of the native fishes have sharp fins or scales for defense. As a result, even the largest predator in the Colorado River basin is vulnerable to the new species of fish that have been introduced throughout the basin, and they must outgrow or avoid predation at every stage of life. Because Colorado pikeminnow take such a long time to mature (7+ years) they are threatened with predation every year until they reach spawning age. This is why the Upper Colorado Program is so concerned with nonnative fish introductions and spends more than a quarter of the annual budget controlling their numbers.

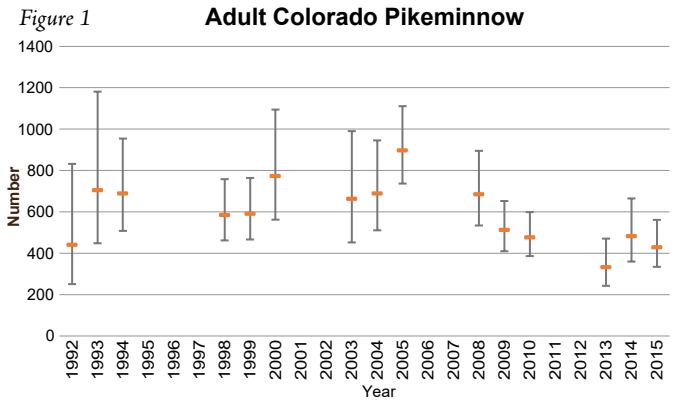
Status of Colorado Pikeminnow in the Colorado River

By **Darek Elverud**, *USFWS Grand Junction Fish and Wildlife Conservation Office*

The Colorado River upstream of Lake Powell contains one of the two naturally reproducing and recruiting populations of endangered Colorado pikeminnow in the world. Monitoring of Colorado pikeminnow in the Colorado River began in 1992. It typically takes approximately 6 years for a Colorado pikeminnow to reach the adult size of 450 mm TL. Researchers complete four to five sampling trip each year from Government Highline Dam, near Cameo, Colorado, downstream to the confluence of the Green and Colorado rivers in Canyonlands National Park, Utah. This stretch of river is a total of 194 miles. Researchers primarily utilize electrofishing boats to sample for Colorado pikeminnow in the Colorado River, but also employ trammel nets to sample backwater habitats where electrofishing equipment is less effective. Sampling for Colorado pikeminnow occurs for three consecutive years, followed by a two or three-year break when no sampling occurs. A recovery goal of 700 adult Colorado pikeminnow for the Colorado River was established in 2002. A Colorado pikeminnow is considered an adult if the fish is greater than or equal to 450 mm TL.

From 1992 until 2015, the Colorado pikeminnow population has ranged from a high of 897 in 2005 to a low of 332 in 2013 (*Figure 1*).

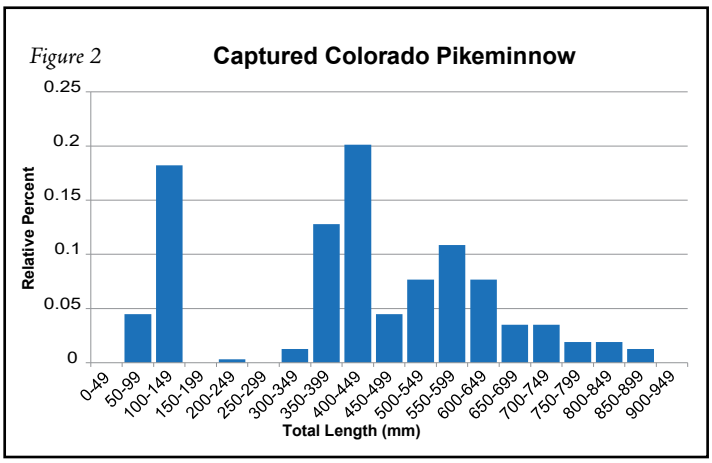
Figure 1



The most recent estimate was 429 adult Colorado pikeminnow in 2015. Confidence limits for the estimates overlap in many of the years, indicating that while the estimates change, the difference is not always statistically significant between years.

In 2019, a total of 314 individual Colorado pikeminnow were captured during sampling. Twenty-three were captured a second time 2019, and one Colorado pikeminnow was captured a third time. Captured Colorado pikeminnow range from 76 to 898 mm (TL). Seventy-three Colorado pikeminnow were captured in 2019 from the year class produced in 2018 (*Figure 2*).

Figure 2



These 73 age-1 Colorado pikeminnow were too small, less than 150 mm TL, to receive a PIT-tag when captured in 2019. Figure 2 also indicates that the record number of young-of-year Colorado pikeminnow produced in 2015 has resulted in a large number of juvenile Colorado pikeminnow (350-449 mm TL) that are approaching the size at which they become adults.

The Colorado pikeminnow population in the Colorado River is currently below the goal of 700 adults. The population peaked in 2005 and then declined until 2014. Annual survival estimates calculated during this period indicate that adult Colorado pikeminnow survival in the Colorado River remained constant. The constant adult survival estimates indicate that the decrease in the population between 2005 and 2013 was due to an insufficient number of juvenile Colorado pikeminnow surviving until adulthood to offset adult mortality. Data collected in 2019 indicating several large year classes (2015 and 2018) of juvenile Colorado pikeminnow being present is encouraging and these fish will hopefully contribute to the rebound of the Colorado pikeminnow population in the Colorado River.

PHOTO BY DAREK ELVERUD, USFWS

Travis Francis, USFWS, holds an adult Colorado pikeminnow captured on the Colorado River.

The Competitive Drive of Anglers Benefits Endangered Fish

By **Randy Hampton**, *Colorado Parks and Wildlife*

One costly effort that Upper Colorado Program partners face is nonnative fish control in popular fishing reservoirs. Controlling nonnative fish not only involves expensive and maintenance-intensive screens and diversions, it involves thousands of hours of employee time to manually perform sometimes unpopular electrofishing removals. Efforts take many years to make an impact and can be altered by weather, runoff, water level, and angler apathy or even hostility. For the managers at Colorado Parks and Wildlife (CPW), the question was: Is there a better way to make the public an enthusiastic partner in recovery efforts?

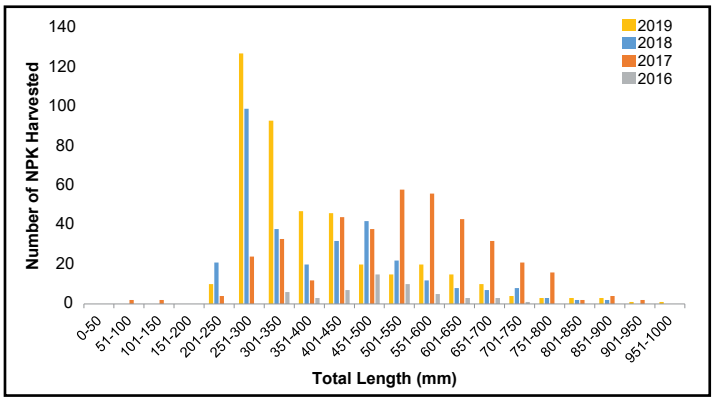
Beginning in 2015, CPW biologists began offering competitive ways for anglers to get involved in nonnative fish control. Approaches include weekend fishing tournaments, season-long 'catch-and-keep' competitions, and specially tagged nonnative fish that reward anglers with valuable prizes. While anglers see competition for cash and prizes, biologists see valuable reductions in nonnative species. Funding for the awards and prizes is provided by the Colorado Water Conservation Board through the Species Conservation Trust Fund.

At Ridgway Reservoir in Southwest Colorado, the results have been impressive. "Since 2015, we've seen a 79 percent reduction in smallmouth bass at Ridgway," explains John Alves, Senior Aquatic Biologist for the Southwest Region. "We have also integrated the angler submitted harvest into our population estimates, allowing us to spend less staff time in recapture efforts."

At Elkhead Reservoir near Craig, biologists report an estimated 52 percent decrease in adult smallmouth bass. "We're also able to impact the northern pike population at Elkhead," says Lori Martin, Senior Aquatic Biologist for the Northwest Region. "In 2019, tournament anglers turned in more than 400 northern pike, the most since the tournament began in 2016."

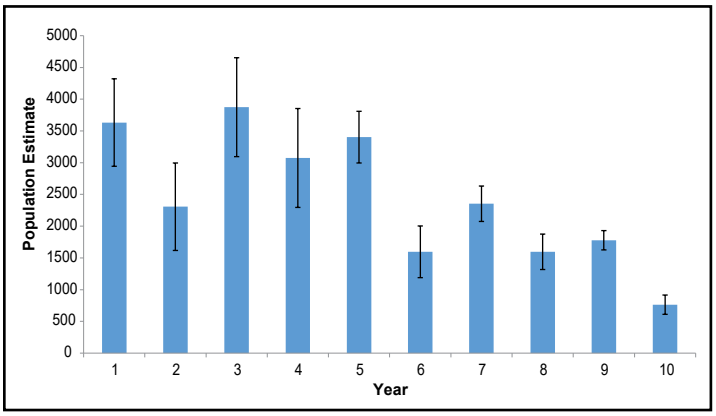
The 2019 competition at Ridgway State Park ran during the month of July. Anglers received one raffle ticket for each smallmouth bass they turned in at a CPW checkstation. The raffle grand prize winner claimed a $2,500 award. Prizes were also given to the anglers with the most smallmouth bass turned in as well as prizes for smallest and largest smallmouth submitted. A total of $12,000 was available in prizes.

At Elkhead Reservoir, the 2019 competition included $1,500 cash prizes for specially tagged smallmouth bass and northern pike. A prize of $750 was also given to the angler who turned in the most smallmouth and the angler with the most northern pike. Daily prizes were also given during the tournament.



Graph showing northern pike harvest length during tournaments at Elkhead Reservoir 2016-2019

Annual participant Levi Archuleta won $750 by catching 35% of the smallmouth bass in the 2019 Elkhead tourney.



Graph showing smallmouth bass populations at Ridgway Reservoir both pre- and post-tournament 2015-2019

Chase Nicholson of Ridgway claimed $5,750 in 2019 by harvesting the most, largest (tie), and smallest smallmouth bass during the tournament. These competitive anglers are key to making the competition work.

PHOTOS BY CPW

Northern Pike Management: Successes and Setbacks

By **Kevin McAbee**, *Upper Colorado Program*

Ever since northern pike began increasing in number and range in the Yampa River in the 1980s, the Upper Colorado Program has known they are a threat to recovery of endangered fish. Northern pike removal began in earnest in the Yampa River in the early 2000s to reduce the number of large predators in the river.

In a 2015 report, researchers from Colorado State University analyzed the effectiveness of the Upper Colorado Program's northern pike removal efforts in the Yampa River. They concluded the amount of effort being used for in-river removal would not achieve the Upper Colorado Program's goals of controlling northern pike. They determined the large number of new pike produced each year from reproduction, and the number of pike swimming downstream from lakes, reservoirs, and ponds, was offsetting the work the Upper Colorado Program was undertaking in the river.

Importantly, the report recommended three steps the Upper Colorado Program could take to improve the effectiveness of removal efforts: 1) disrupt northern pike spawning in the river; 2) increase removal effort in the Yampa and Green rivers; and 3) prevent or reduce escapement of from off-channel sources and reservoirs. As described in these examples, the Upper Colorado Program heeded the advice of sound science and adjusted the way it managed northern pike. As a result, the Upper Colorado Program has seen a measurable reduction in northern pike numbers across the upper basin in the last five years (story on page 12).

Unfortunately, simultaneously to the successes, there have been setbacks. Specifically, northern pike have been introduced into new locations, likely through illegal introductions (see story below). Each time a northern pike is introduced to a new location, it lengthens the time and increases the money required to meet Upper Colorado Program goals.

Mamm Creek: Successfully preventing escapement from off-channel sources

Along the mainstem Colorado River between Glenwood Springs, Colorado and Cisco, Utah, there are many gravel pit ponds which connect to the river at it rises during spring runoff. Each year when the ponds connect, fish can enter or leave the pond. Fish that remain after the river has receded are given a vegetated, calm location to lay eggs and a small area to easily eat other fish; this is the perfect area for a large ambush predator like a northern pike. Each summer, large adult pike spawn, create many offspring, and eat the copious prey in the pond. Each subsequent spring, the pond contains many one year old pike that have grown in this protected environment and which are large enough to live in the river.

One such set of ponds are the Mamm Creek Pits, between Rifle and Silt, Colorado. This complex of three pits was discovered to have northern pike after the large runoff in 2011; Pit 1 had hundreds of northern pike, while Pits 2 and 3 had just a few.

Aerial photo of Merwin Trap at outlet breach in Mamm Creek Pit #1 from Google Earth imagery. Photo taken in June 2016.

In 2015, Colorado Parks and Wildlife (CPW) used a new tool to remove northern pike in Pit 1, called a 'Merwin Trap', which is an oversized trap net. During runoff, this net captured any fish that tried to leave the pond when the river was connected and prevented new fish from entering the pond. Later in the summer, it removed northern pike that resided in the pond.

The Merwin trap was an overwhelming success. Over 500 northern pike were removed from pit #1 in its first two years of use, including some as big as 40 inches! By 2019, CPW no longer captured any northern pike in Pit 1. Using standard boat electrofishing, CPW also removed the last northern pike from Pits 2 and 3 in 2017. Therefore, the Upper Colorado Program believes it has removed all northern pike from this off-channel source. Removing this off-channel source has improved conditions in the river as well. Upper Colorado Program crews have only caught one northern pike in the river in 2018 and 2019.

Two New Locations of Northern Pike Recently Discovered

Northern pike have been illegally introduced into a new upper Colorado River basin reservoir, lake, or pond at least five times since 2000. Each time northern pike is introduced into a new location where it could escape downstream and impact endangered fish, additional recovery actions are required. Two recent introductions demonstrate how one action by a member of the public can offset years of work by the Upper Colorado Program.

In 2018, CPW determined northern pike had been introduced in Kenney Reservoir near Rangely, Colorado, likely illegally by a member of the public. Kenney Reservoir is an on-river reservoir on the White River. The concern for the Upper Colorado Program is that this introduction could cause the White River to have a reproducing population of northern pike,

continued on page 12

Two New Locations of Northern Pike Recently Discovered, *continued from page 11*

like in the Yampa River. The Upper Colorado Program has worked hard to try and eliminate this population before it spreads downstream, but a few northern pike have already been captured in the river downstream of the Reservoir.

Similarly, in 2018, CPW discovered northern pike and yellow perch in the East Rifle Municipal Pond. The source of these two fish is unknown. However, it is possible that the northern pike and yellow perch were illicitly stocked directly into the pond. CPW hopes to shift their efforts from the newly northern pike free Mamm Creek Pits to East Rifle Municipal Pond.

The Upper Colorado Program is committed to reducing the impact of northern pike on endangered fish. However, we need the public's help to do so.

Follow Your State's Fishing Regulations

DO NOT MOVE FISH!

If you know anyone who has moved fish illegally, please report them to your state wildlife agency.

Spring Netting Reduces Northern Pike Abundance in the Yampa River

By **Kevin Bestgen,** *Colorado State University (CSU),* **Kevin McAbee,** *Upper Colorado Program* **and Koreen Zelasko[1],** *CSU*

As the Yampa River thaws each April, biologists from Colorado Parks and Wildlife (CPW), the U.S. Fish and Wildlife Service (USFWS), and Colorado State University (CSU) brave the frigid temperatures to set nets in the slow, weedy edges of the river (called backwaters). The goal is to remove predaceous, invasive northern pike and reduce negative effects on native and endangered fishes. Setting nets is a newer, experimental technique designed to capture northern pike before they deposit eggs in shoreline vegetation. Early spring netting offers the dual benefit of removing large, adult predators and reducing the number of small pike born each year.

Based on the steady and substantial decline in the number of northern pike removed from the river, the work seems successful (*orange line on Figure 1*). However, simply counting the number of pike removed is not a reliable method for understanding how many are actually in the river.

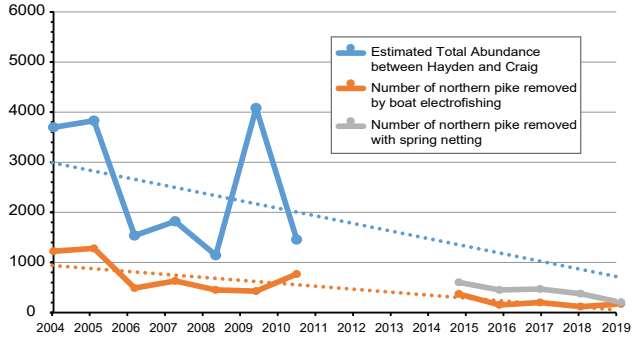
To accurately determine northern pike abundance in one reach of the river, crews undertook a mark-recapture study. First, USFWS crews used boat electrofishing to capture 84 northern pike in the river before netting began. Each fish received a tag to uniquely identify it in the "mark" portion of the study. Next, crews performed normal removal work (netting and boat electrofishing), documenting the proportion of fish that had a tag. This was the "recapture" portion of the study. In total, USFWS and CPW removed 251 northern pike, of which 23 had tags.

Using statistical analyses, researchers at CSU compared the proportion of fish recaptured (23 of 84) to the total number of fish removed (251) to estimate that just over 900 northern pike inhabited the Yampa River between Hayden and Craig in 2019.

Previous mark-recapture estimates performed between 2004 and 2010 determined that as many as 4,000 northern pike inhabited this reach (Figure 1). Comparing the 2019 estimate to earlier estimates, researchers concluded that the downward trend in northern pike was substantial and legitimate (*dotted blue line on Figure 1*). These results support continued use of boat electrofishing and backwater netting as effective northern pike removal techniques.

Biologists will continue to set nets in the frigid Yampa River conditions in early spring and perhaps expand this approach to other reaches, to provide additional control of nonnative northern pike, and move the endangered fishes forward on the path to recovery!

Figure 1 **Results of Northern Pike Removal Efforts**



Northern pike captured by gill net in the backwaters of the Yampa River.

The backwaters of the Yampa River are ideal habitat for spawning northern pike.

PHOTOS BY TORY EYRE, CPW

Jerrod Bowman of Navajo Nation named 2020 Researcher of the Year

By **Melissa Mata,** *San Juan Program*

Jerrod Bowman, Fish Biologist with the Navajo Nation Department of Fish and Wildlife was selected as the 2020 Outstanding Researcher of the Year. Jerrod is responsible for daily management of the Navajo Agricultural Products Industry (NAPI) grow-out ponds for razorback sucker. His role includes maintenance and up-keep activities of the ponds and informing partners when problems arise. He helped set-up the flow-training system for razorback sucker. In addition, Jerrod is responsible for harvesting and stocking razorback sucker greater than 300mm at various locations, with support from the Nation and assistance from the U.S. Fish and Wildlife Service. In the last year, with Jerrod's assistance, Navajo Nation acquired funds from the Bureau of Indian Affairs to help improve NAPI ponds by installing harvest kettles in both Hidden Pond and East Avecot. In addition, Jerrod has been instrumental in solving and alleviating problems at the Public Service Company of New Mexico (PNM) fish passage. Between 2011-2017, the PNM Fish Passage was operated selectively. During that time, only 183 razorback sucker moved upstream. In 2018 and 2019, the PNM Fish Passage structure changed operation to allow more than 600 suckers to move upstream. Coincidently in 2019, the San Juan Recovery Program detected larval razorback sucker 20 miles further upstream than previously found. This would not be possible without support from Jerrod and the Nation to maintain PIT-tag technology and keep the passage structure clear from obstructions. Much of the conservation and research advancement produced in the last few years would not have been possible without Jerrod's hard work and dedication to the San Juan Program.

PHOTO BY TOM CHART, USFWS

Melissa Mata, Program Coordinator for the San Juan Program, presents Jerrod Bowman, Navajo Nation, with the 2020 Researcher of the Year Award.

You are What You Eat: A Dietary Approach to Survival of Bonytail

By **Cheyenne Owen,** *Upper Colorado Program,* **Zane Olsen,** *UDWR,* **Matthew Fry,** *USFWS,* **Dale Ryden,** *USFWS,* **Travis Francis,** *USFWS,* **Brian Sheer,** *USFWS,* **Michael Gross,** *USFWS,* **Haden Vanwinkle,** *USFWS,* **Ted Smith,** *CPW,* **Gibson Gaylord,** *USFWS*

Program hatcheries stock over 35,000 adult bonytail per year, however survival appears to be extremely low. Program partners have begun working together to address issues that could influence post-stocking survival, including nutrition. High levels of mesentery fat and fat deposition in livers have been observed, which could negatively impact liver function and metabolism.

Several efforts to determine an optimal bonytail diet are underway. In summer 2019, Wahweap State Fish Hatchery (Big Water, UT) tested a low energy, commercial pond diet (32% protein and 6% fat) supported by bug lights which attract prey, on young-of-year (YOY) bonytail in grow-out ponds, and observed increased growth and lower percent body fat than previously recorded. Health Condition Profile (HCP) findings also showed that only 5% of bonytail sampled from this study had fatty livers and only 5% had excessive mesentery fat; compared to 65% and 55% in bonytail sampled during last year's HCP. Recent HCP results show that 95% of bonytail sampled from this study had normal livers and only 5% had excessive mesentery fat; compared to 35% with normal livers and 55% with excessive mesentery fat in last year's HCP. J.W. Mumma Native Aquatic Species Restoration Facility (Alamosa, CO) tested the same diet on adult bonytail in late summer 2019. Growth was similar between the control commercial trout diet and the experimental commercial pond diet over 106 days; although higher growth per feed fed was observed with the control diet. This study is ongoing and further analyses are forthcoming.

Starting fall 2019, Ouray National Fish Hatcheries- Randlett (Vernal, UT) and Grand Valley Unit (Grand Junction, CO) both participated in studies testing either YOY or adult bonytail growth performances in recirculating systems on six diets produced at the USFWS Bozeman Fish Technology Center. YOY and adult bonytail gained more weight on a lower protein and fat diet (40% and 12%, respectively) than the control diet (45% protein and 15% fat) over a 56 day period.

Commercial feed ground and sifted to a smaller size to feed YOY bonytail at Wahweap State Fish Hatchery during feed study.

PHOTOS BY ZANE OLSEN, UDWR

Bug lights overhang pond at Wahweap State Fish Hatchery.

Results of all diet studies will be used to choose an optimal bonytail diet. Encounters of bonytail will be monitored into the future to determine impacts on post-stocking survival.

Endangered Fish Benefit from Expanding River Partnerships

By **Don Anderson,** *Upper Colorado Program*

A broad spectrum of people and organizations in the upper Colorado River basin have a vested interest in keeping more water in local rivers – not only to recover endangered fish, but also to improve sport fishing, protect water quality, support rafting and kayaking, maintain attractive riverways, generate hydropower, and help the upper basin states meet delivery obligations to the lower basin.

The Upper Colorado Recovery Program has seen various groups emerge in recent years as kindred spirits in these efforts to keep more water in the Colorado River and its tributaries. While many are not specifically affiliated with our Program, their efforts nevertheless align with Upper Colorado Program flow objectives. In 2019, for example, organizations as diverse as the Colorado Water Trust, the Yampa River Fund, the Roaring Fork Conservancy, and the Colorado River District took bold actions to secure more water for instream flows, providing benefits for multiple interests including (but certainly not limited to) the Upper Colorado Program.

The Colorado Water Trust (CWT) describes itself as "a small non-profit that works with people using win-win solutions across the state of Colorado to keep rivers flowing and communities healthy". It has a long history of working to enhance flows in various Colorado River tributaries. In 2019, for the first time, CWT launched an initiative that acquired 327 acre-feet of water to generate clean hydroelectric power from the Colorado River in Colorado's Grand Valley, while also enhancing flows for endangered fish through the crucial '15-Mile Reach' above the Gunnison River confluence. "We were thrilled to establish this innovative and groundbreaking partnership with Orchard Mesa Irrigation District, Grand Valley Water Users Association, and the Walton Family Foundation to help support a historic hydroelectric facility and benefit endangered fish," says Executive Director Andy Schultheiss, "This is exactly the kind of win-win partnership we love to facilitate."

The Yampa River Fund (YRF) describes itself as "a collaborative community-based organization dedicated to identifying and funding activities that protect the water supply, wildlife habitat, and recreational opportunities provided by the Yampa River". YRF launched in 2019 with extraordinary assistance from The Nature Conservancy, the Yampa Community Foundation, and more than 20 community partners in the Yampa Valley region. YRF already has amassed a multi-million-dollar endowment, and it expects to use its resources in various ways in coming years, including enhancing critical low flows in the Yampa River through leases of reservoir water. YRF Manager Andy Baur says, "Our Fund will invest in conservation activities that support valley livelihoods and ensure a healthy, flowing Yampa River for generations to come. To the extent our efforts also benefit native species like the Colorado pikeminnow and razorback sucker, we think that's a wonderful additional outcome of these extraordinary local efforts."

Finally, the Upper Colorado Program also benefited from a 2018 water contract that the Roaring Fork Conservancy (RFC) entered into with the Colorado River Water Conservancy District as an experimental arrangement. The contract for water from Ruedi Reservoir was used primarily to move winter water down the Fryingpan River (a Colorado River tributary) and prevent 'anchor icing' that impairs coldwater fisheries. In 2019, 299 acre-feet of this leased water remained 'left over' and available to the Upper Colorado Program to augment low flows in the 15-Mile Reach. Thus, both cold-water fish in the Fryingpan River and warm-water endangered fish farther down in the Colorado River benefited from the RFC's innovative experiment.

It takes a village to keep a hard-working river like the Colorado alive, healthy, and continuing to deliver benefits to roughly 40 million Americans who rely on its flow. Many organizations make their own modest contributions to that gargantuan effort, and that list of organizations continues to grow. Happily, a broad array of river enthusiasts get to enjoy the fruits of their collective labors, including the Upper Colorado Program.

PHOTO BY THE RIVER DISTRICT

Endangered species updates


PHOTO BY USFWS

Ben Schleicher holds an adult Colorado pikeminnow caught in the Colorado River.

Colorado pikeminnow

Colorado pikeminnow are showing different trends in the three basins where they occur. In the Green River basin, recent analyses of data through 2018 indicate that the population continues a declining trend since 2000. For the Colorado River upstream of Lake Powell, Colorado pikeminnow numbers are low, but the population appears to be more stable and fluctuating. Some signs point to a new group of young fish spawned in 2015 that may be entering adulthood. Stocking of Colorado pikeminnow into the San Juan River has led to increasing numbers of the fish there, with wild-spawned larvae and now juveniles observed.


PHOTO BY UDWR

Humpback chub encountered in Westwater on the Colorado River.

Humpback chub

Humpback chub inhabit rocky-canyon, whitewater habitats. Large populations of humpback chub are found in the Little Colorado River and are increasingly common in western Grand Canyon. In the upper basin, the Black Rocks and Westwater Canyon populations are stable with recent increases over the past 4 years. The Desolation/Gray Canyons and Cataract Canyon populations also appear stable, but with fewer fish. Conservation partners are investigating ways to re-introduce humpback into Dinosaur National Monument, which is now considered extirpated. The USFWS proposed to reclassify humpback chub as a threatened species in January of 2020.


PHOTO BY UDWR

A bonytail raised at UDWR's Wahwep Fish Hatchery in Big Water, Utah

Bonytail

Over 452,000 bonytail have been stocked in the upper Colorado River basin since 1996, of which over 17,500 have been encountered. The majority of encounters (85%) are detections, with most detections (83%) occurring via stationary PIT-tag arrays. Nearly half of bonytail encountered have been at-large for less than 30 days, though several individuals have been at-large greater than 2,000 days. In 2019, all four Program hatcheries conducted bonytail Health Condition profiles, a system to assess fish health and condition. Across facilities, 33-100% of the bonytail tested possessed fatty livers and 55-100% contained excessive mesentery fat. Based on these results, the Program is implementing new diets to improve bonytail fitness.


PHOTO BY NPS

Close up of a razorback sucker held by Kevin Thompson of CPW.

Razorback sucker

Good news continued for razorback sucker in 2019 and 2020. In the spring of 2019, 45 age-1 razorback sucker were found on the San Juan River, a record for the species in that basin. A few of them were then detected on antennas in McElmo Creek, documenting survival through their second summer. A record number of seven floodplain wetlands connected along the Green and Colorado rivers, providing safe, food-rich habitat for larval razorback sucker to survive their first summer of life. In the lower basin, sampling in Lake Mohave found high numbers of razorback sucker at multiple sampling locations. The USFWS is preparing documents to propose downlisting the species to threatened.

What's in the Hump of a Humpback Chub?

By **D.L. Ward,** *U. S. Geological Survey* **and M.B. Ward,** *University of Utah*

The function of the hump on adult humpback chub has been the subject of longtime conjecture. Hypotheses about the purpose of the hump range from it being a feature that makes it easier to swim in swift water to speculation about how the hump may have reduced predation vulnerability to Colorado pikeminnow. We used comparative histology of the head region of captive-reared and wild specimens of humpback chub to evaluate whether histological examination could give insight into the function of the hump. Tissues were sectioned, stained, and photographed under a microscope at 2×, 4×, and 40× magnification. The hump is composed almost entirely of skeletal muscle, with little nervous system innervation or fatty tissue. Hump muscle and dorsal muscle appear very similar in terms of muscle cell size, fat content, and connective tissue content. No apparent differences exist between the hump tissues of wild-caught and captive-reared individuals. Histological analysis and study of the anatomical structure of the head through dissection, along with evidence from other species, suggest that the hump evolved to reduce predation vulnerability. Although the reason for the evolution of the hump in humpback chub remains uncertain, additional information about the composition of the hump can help to support or refute theories related to its function. To read the full article, please click the link below.

Citation:

Ward, D.L., and Ward, M.B., 2020, What's in the hump of the humpback chub?: Western North American Naturalist, v. 80, no. 1, article 12, p. 98-104, https://scholarsarchive.byu.edu/wnan/vol80/iss1/12/

Fish Illustration © Joseph R. Tomelleri

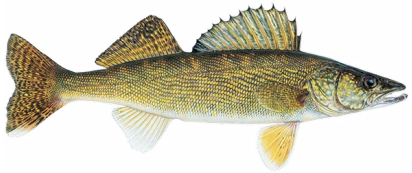
HELP PREVENT THE SPREAD OF NONNATIVE SPECIES

CATCH & keep

KNOW THE LAW

SMALLMOUTH BASS

NORTHERN PIKE



WALLEYE

UTAH AND WYOMING HAVE
CATCH & KEEP
REGULATIONS IN CERTAIN RIVER REACHES. IT IS ILLEGAL TO RETURN THESE FISH TO THE RIVER.

One hundred years ago only 13 native species swam in the upper Colorado River and its tributaries–today they have been joined by more than 50 nonnative species. Introduction and establishment of problematic nonnative predators affect native fishes, the UDREFRP and SJRBRP programs, anglers, and local communities with high environmental and economic costs. Removing illegally introduced species is expensive and time-consuming. We must all join forces to prevent the spread of these problematic nonnative predators to preserve native fish in the river and desirable sportfisheries in reservoirs.

Review your state fishing regulations. State regulations may vary based on river mile and are the **LAW**. Regulations on the river may be **very different** than in reservoirs. **KNOW THE LAW.**

http://cpw.state.co.us/Documents/RulesRegs/Brochure/fishing.pdf
https://wildlife.utah.gov/fishing/fishing-regulations.html
https://wgfd.wyo.gov/Fishing-and-Boating/Fishing-Regulations
http://www.wildlife.state.nm.us/fishing/game-fish/