Appendix C: 2018 System Conservation Pilot Program Update

Background

This appendix is an update to the Final Report on the Colorado River System Conservation Program (SCPP) in the Upper Colorado River Basin (SCPP Report) and provides information from the 2018 SCPP project year, including results and lessons learned specific to the final year of the SCPP.

I. 2018 System Conservation Pilot Program: Results

A. Summary of Selected Projects

Thirty proposals were received for 2018, from which 23 projects were selected. Nineteen of the selected projects were contracted and implemented at a funding amount of approximately $4 Million. The reasons four approved applicants chose not to participate varied. Six of the implemented projects had multiple participants (watershed approach or ditch company projects). Table C.1 summarizes the applications received and projects implemented by State.

Table C.1. – Total Number of Applications and Projects in 2018 by State

State	Applications Received	Projects Implemented
Colorado	5	2
New Mexico	4	3
Utah	12	6
Wyoming	9	8
Total	**30**	**19**

Table C.2 highlights the types of projects implemented in 2018. For the fallowing projects, no irrigation water was applied to the enrolled fields for the duration of the irrigation season, and for the split season deficit irrigation projects, no irrigation water was applied during a specified period of the irrigation season (e.g., June 1 through September 30). Some of the projects were a combination in which some fields were fallowed, some participated in split season deficit irrigation, and others were planted with crops that consumed less water (alternative cropping).

Table C.2. – Types of Projects Implemented in 2018

Project Type	2018
Fallow	8
Split Season Deficit Irrigation	9
Combination of Fallow, Split Season Deficit Irrigation & Alternative Cropping	2

Figure C.1 on page C.3, below represents the locations of the projects selected and implemented by project type in 2018.

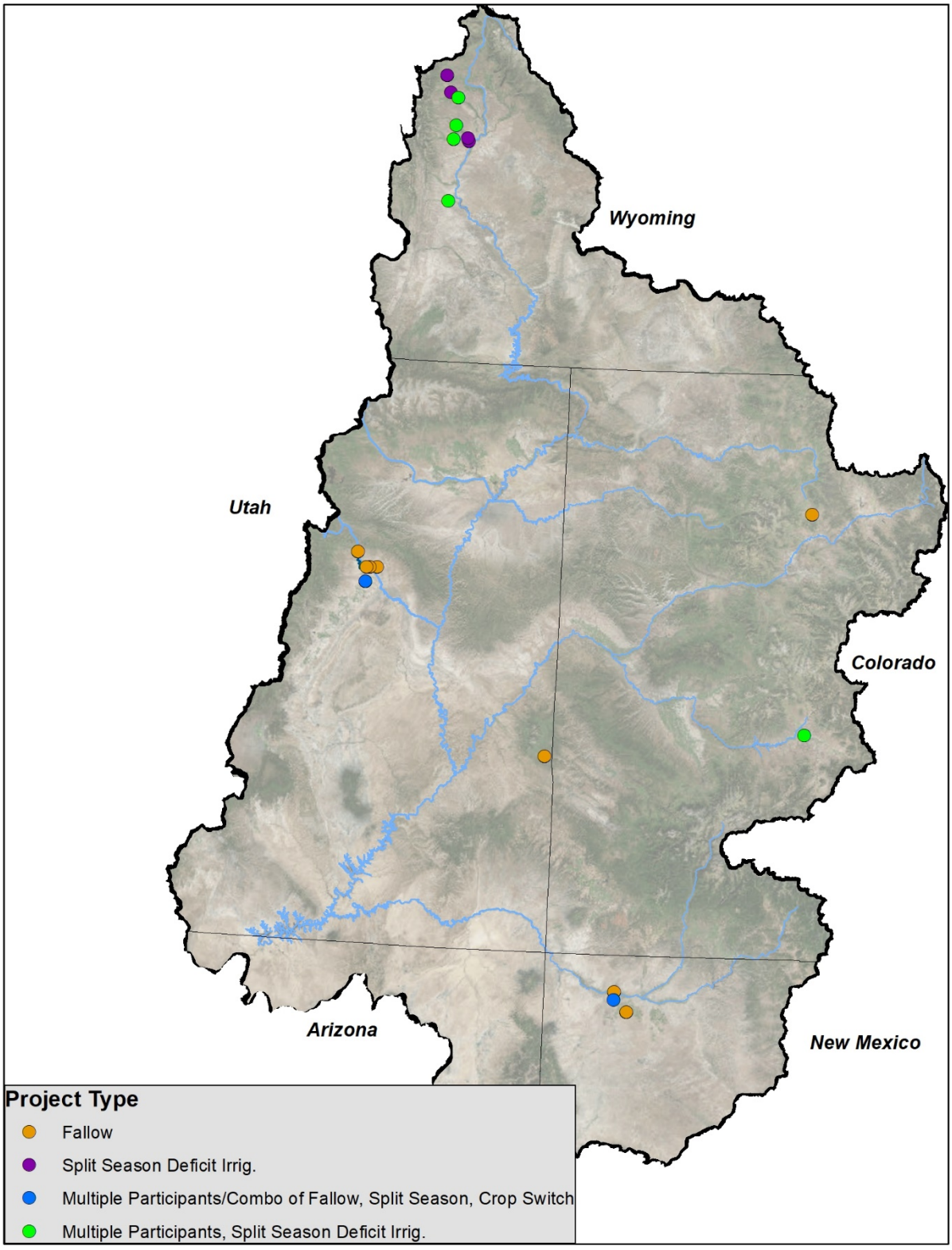

Figure C.1. – Location of the Projects Selected and Implemented in 2018

B. *Summary of the Contracted Conserved Water and Associated Costs*

The participants in SCPP were compensated based on an estimated average historical conserved consumptive use value associated with each project, as described in the SCPP Report. The method for calculating the potential conserved consumptive use varied by state depending on data availability. The methodology used for each state is documented in the SCPP Report.

Table C.3. shows the contracted consumptive use estimates by tributary and associated compensation for 2018. Based on the contracted historical consumptive use estimates, the Funding Agencies provided $3,965,491 to conserve 25,097 acre-feet of water in 2018.

Table C.3. – Total Conserved Consumptive Use (CCU) and Associated Compensation for the 2018 Projects

Tributary Name	State	Total Acreage	Crop	Project Type	Total Estimated CCU (acre-feet)	Cost per acre-foot	Total Cost
Egeria Creek	CO	1,941	Grass Pasture	Fallow	2,811	$ 150	$ 421,650
Tomichi Creek	CO	721	Grass Pasture	Split Season Deficit Irrigation	631	$ 79	$ 50,000
Animas River & San Juan	NM	64	Alfalfa	Combination of Fallow & Split Season Deficit Irrigation	169	$ 150	$ 25,281
Animas River & San Juan	NM	154	Alfalfa & Corn	Fallow	358	$ 150	$ 53,775
San Juan	NM	1,656	Variety	Fallow	3,626	$ 219	$ 793,985
Two Mile Creek	UT	250	Alfalfa Grass Mix	Fallow	183	$ 150	$ 27,516
Price River	UT	1,199	Variety	Combination of Fallow & Split Season Deficit Irrigation	2,317	$ 150	$ 347,015
Price River	UT	50	Alfalfa	Fallow	126	$ 140	$ 17,664
Price River	UT	51	Alfalfa	Fallow	129	$ 140	$ 18,017
Price River	UT	9	Alfalfa	Fallow	22	$ 140	$ 3,031
Price River	UT	53	Alfalfa and Grass Pasture	Fallow	132	$ 140	$ 18,487
Cottonwood Creek	WY	1,407	Grass Pasture	Split Season Deficit Irrigation	966	$ 150	$ 144,967
Fontenelle	WY	2,552	Grass Pasture	Split Season Deficit Irrigation	3,087	$ 150	$ 463,013
Horse Creek	WY	616	Grass Pasture	Split Season Deficit Irrigation	900	$ 150	$ 135,048
Middle and South Piney Creek	WY	4,777	Grass Pasture	Split Season Deficit Irrigation	4,936	$ 150	$ 740,430
Green River	WY	1,057	Grass Pasture	Split Season Deficit Irrigation	678	$ 150	$ 101,700
Muddy Creek	WY	151	Grass Pasture	Split Season Deficit Irrigation	127	$ 150	$ 19,050
North Piney Creek	WY	3,183	Grass Pasture	Split Season Deficit Irrigation	3,240	$ 150	$ 486,015
North Cottonwood Creek	WY	555	Grass Pasture	Split Season Deficit Irrigation	659	$ 150	$ 98,850
Total	**-**	**20,445**	-	-	**25,097**	-	**$ 3,965,491**

**Note that multi-year projects selected in previous years, that were still participating in 2018, are not shown in the above table, but their CCU estimates for 2018 are shown in Table E.1.*

C. *Summary of the SCPP Conserved Consumptive Use Analyses*

Similar to the first three years of the SCPP, individual project performance was evaluated for 2018 projects through project-specific verification plans. Each plan included an analysis of potential consumptive use during the conservation activity using climate data from a nearby climate station, reduced as necessary by water supply limitations. The purpose of the consumptive use analysis was to quantify the amount of water each project conserved by participating in the SCPP. These analyses were for study purposes only and did not impact participant compensation. Based on these analyses, an estimated 27,804 acre-feet of water was conserved in 2018. The individual results from these analyses and a discussion of the methodology is presented in Appendix E. Differences between the applicants' estimated conserved consumptive use savings and the final conserved consumptive use calculation are due to climate and water availability for the SCPP year.

II. 2018 System Conservation Pilot Program: Observations

A. *Program Administration and Project Implementation*

i. **Coordinated Participation**. In 2018, there were a total of 6 multi-party SCPP projects consisting of 56 participants: 4 projects in Wyoming and 1 in Colorado had multiple participants, and 1 project in Utah involved a canal company. See II.B.a, below.

ii. **Agency relationships**. Use of agents in 2018 by multi-party SCPP projects facilitated the contracting process.

iii. **Tribal participation**. Tribal participation in 2018 by a New Mexico participant accounted for approximately 14% of the estimated conserved consumptive use in the 2018 SCPP. Moreover, two applications were received from Tribes or Tribal enterprises in 2018, although only one ultimately decided to participate in the SCPP.[1]

iv. **Stabilized compensation**. In 2018, most participants were paid $150 per acre-foot of conserved consumptive use.

v. **Streamlining**. Streamlined project application, contracting and funding processes and timeframes.

a) Template System Conservation Implementation Agreement- Non-Tribal: A standard participation agreement was developed for all non-tribal participants to help further uniformity and fairness in the contracting process, as well as to ensure that project activity began only upon execution of the agreement.

b) Template System Conservation Implementation Agreement-Tribal: A standard participation agreement was developed for all Tribal participants to help further uniformity and fairness in the contracting process, as well as to ensure that project activity began only upon execution of the agreement.

[1] Tribal participation in the SCPP began in 2017, with a substantial Tribal fallowing project in New Mexico. The 2017 Tribal project yielded an estimated conserved consumptive use amount of 2,895 acre-feet—the second largest SCPP project in 2017. See Table D.1, Appendix D: System Conservation Pilot Program Consumptive Use Analysis (2017).

c) **Programmatic Funding Agreement**. For 2018, a new programmatic funding agreement broke down costs by project for each funding agency and determined total payments due. UCRC issued only two invoices to each funder that included all projects – once in the spring (before first participant payments were due) and once in the fall (for second/final payment to participants). Previously, UCRC invoiced each funding agency for their portion of each project payment at the beginning and end of each project.

d) **Refined SCPP Application**. The SCPP application was updated for 2018 to include an agricultural project attachment that was mandatory for agricultural applicants. The attachment collected information on a field-by-field basis, including cutting dates, methodology of conserved consumptive use estimates, and which headgates would be closed. These questions helped to decrease the administrative time required to process the applications.

e) **Aggressive timeframes**. In 2018, standard agricultural contracts were expedited in an effort to execute the contract before the start of project activity. Tighter deadlines for contract review were enforced for all involved parties, and the streamlined contract process helped to make contracting more efficient in 2018.

B. Operational Observations

a. Project types. In 2018, there were two new types of projects.

- ***Watershed Approach Projects*.** In 2018 there were multiple watershed approach projects. These projects were made up of multiple participants fallowing acreage along the same stream. Watershed approach projects were, in part, aimed at addressing the issue of shepherding water.
  - **Contracting**. For the watershed approach projects, an NGO acted as the contracting agent. The NGO contracted with the individual landowners and the UCRC contracted with the NGO. A single contract was developed with the NGO, and individual verification plans were developed for each participant. State and UCRC legal counsel also reviewed the NGO's contracts with the individual landowners. With multiple participants doing different project activities, more administrative time was needed for these projects. Without the NGOs coordinating with all of the participants on the stream, much more administrative time would have been required to contract separately with each landowner.
  - **Verification.** The watershed approach projects had multiple participants in each project and required more time to verify all the participating fields and headgates.
  - **Shepherding.** Watershed approach projects organized by NGOs in 2018 were the first attempt at addressing shepherding. If most or all users on a stream are

participating in the project then shepherding could occur naturally, at least to the next main tributary.

- ***Large ditch managed by a ditch company.*** One ditch company participated in 2018 as the contracting entity with several of their canal shareholders. Their participating shareholders were given the choice to do full season fallow, split season fallow, or switch to a crop that used less water. The ditch company was assisted by an NGO in administering the project. All water was diverted at the headgate, but water for participating fields was delivered to the end of the canal. The ditch company tracked water not used by participants and provided the UCRC with end of the year estimates on actual water delivered back to the river. This project approach was ideal, as it both quantified the water returned to the river and assured that other shareholders did not pick up the conserved water.

C. Project Costs, Benefits, and Risks & Outreach

a. Negotiating cost per acre-foot. In 2018, many applicants proposed a lower compensation per acre-foot than was proposed in previous years. Applicants that proposed a higher cost per acre-foot were asked if they would accept a lower unit price; however, not all projects were funded at the same cost per acre-foot in 2018 (See II. A. iv, above) as determined on a case-by-case basis, due to specific variations in projects.

b. Importance of focused outreach. Focused outreach continued through the final year of the program. Sixty-eight percent of the 2018 projects were associated with Trout Unlimited and its concerted outreach efforts, primarily in Utah and Wyoming.

Appendix D: System Conservation Pilot Program Consumptive Use Analysis (2017)

Background

The Upper Basin System Conservation Pilot Program, established through the System Conservation Agreement[2], promotes temporary, voluntary, and measurable reduction of consumptive use of Colorado River water. Though the SCPP likely provided benefits to the Colorado River System, its purpose was not to measurably increase levels in Lakes Powell and Mead. Rather, the program was designed to assess various aspects of and identify challenges relating to a program involving temporary, voluntary, and compensated reductions in consumptive use of Colorado River Water. As part of the SCPP, individual project performance is evaluated through project-specific verification plans which include a potential consumptive use analysis—reduced as necessary by water supply limitations—with climate data from a nearby climate station. The purpose of the consumptive use analysis is to quantify the amount of water each project conserved by participating in the System Conservation Pilot Program during the 2017 irrigation season.

As part of the 2017 project selection process, the conserved consumptive use estimates provided in the applications were reviewed, verified, and adjusted if needed. The estimates were generally based on historical averages that accounted for water supply limitations. However, some of the estimates were negotiated based on pending water right court cases or based on documented reports.

Approach

The following simplified approach was used to estimate actual consumptive use savings:

1. **Collect climate data from nearby climate stations.** A nearby climate station was selected for each project. Daily climate data, required for use with the Penman-Monteith method, was reviewed and corrected using ASCE standards as outlined in Appendix D ASCE Manual 70.
2. **Estimate potential consumptive use.** The potential consumptive use for the projects in each state was estimated using the following methods. For consistency, the method used in this analysis—either modified Blaney-Criddle or Penman-Monteith—was selected based on the method used for the application and the availability of meteorological data.
    - **New Mexico –** Modified Blaney-Criddle was used to estimate the conserved consumptive use in most of the applications; therefore, Modified Blaney-Criddle was used to estimate potential consumptive use for the associated analyses. Hargreaves, calibrated to Penman-Monteith, was used to estimate the conserved consumptive use in one application; therefore, a daily Penman-Monteith calculation was used to estimate potential consumptive use savings for 2017.

[1] "Agreement Among the United States of America, through the Department of the Interior, Bureau of Reclamation, the Central Arizona Water Conservation District, the Metropolitan Water District of Southern California, Denver Water, and the Southern Nevada Water Authority, for a Pilot Program for Funding the Creation of Colorado River System Water through Voluntary Water Conservation and Reductions in Use."

- **Utah –** Modified Blaney-Criddle was used to estimate the conserved consumptive use in the Utah applications and, therefore, was used to estimate potential consumptive use savings for 2017.
- **Wyoming –** Mapping EvapoTranspiration with High Resolution and Internalized Calibration (METRIC) was used to estimate the conserved consumptive use in the applications. Because this method was only used to develop estimates for 2011, a daily Penman-Monteith calculation was used to estimate potential consumptive use savings for 2017.
- **Colorado –** Modified Blaney-Criddle was used to estimate the conserved consumptive use in the applications and, therefore, was used to estimate potential consumptive use savings for 2017.

The potential consumptive use estimates were reduced by effective precipitation (per SCS NEH4 guidelines for the Penman-Monteith calculations and the SCS TR-21 method for the Modified Blaney-Criddle calculations) to determine the potential consumptive use from irrigation during the project-specific contracted dates of participation. The calculated consumptive use from an irrigation source water equals the maximum net savings during the fallowing or deficit irrigation period.

3. **Adjust results for water supply limitations.** In general, 2017 represented a good water supply year with warmer temperatures—allowing for a longer growing season. To account for water supply limitations, the following methods were used to adjust the potential consumptive use estimates based on the available information in each state:
    - **New Mexico** – According to the State Engineers Office, the ditches associated with the New Mexico projects were not supply limited in 2017; therefore, no water supply limitations were applied to the consumptive use estimate.
    - **Utah –** The State Engineers Office confirmed 2017 was a wet hydrologic year and Utah projects were not supply limited. Therefore, no water supply limitations were applied to the consumptive use estimate.
    - **Wyoming –** Diversion records are not recorded unless a ditch is being administered; however, the State Engineer's Office confirmed it was a wet hydrologic year and the consumptive use estimates were not adjusted by the average historical shortage.
    - **Colorado –** 2017 diversions records were reviewed to confirm that diversions were available for full supply on the tributaries of participating projects; therefore consumptive use estimates were not adjusted by the associated average historical shortage.

Results

Results from the consumptive use analyses are provided in Table D.1. In the observations column, "Actual water savings is close to the projected value" indicates the results from this analysis were within 10 percent of the projected conserved consumptive use estimate. "Actual water savings is higher/less than the projected value" indicates the results from this analysis were more/less than 10 percent of the projected conserved consumptive use estimate. In general, the majority of the conserved consumptive use estimates for the projects selected in 2017 were within 10 percent of the estimates provided in the

application. Note that differences in water savings from projected can be due to weather variations from average conditions, water supply variations from average conditions, or both.

Table D.1. The 2017 Estimated Conserved Consumptive Use (CCU) Results

Tributary Name	State	Total Acreage	Crop	Dates of Fallowing or Deficit Irrigation (2017)	Selected Climate Station	Cost per acre-foot	Total Cost for 2017	Estimated CCU per Application (acre-feet)	Estimated CCU per Analysis (acre-feet)	Observations
Animas River & San Juan River	NM	125	Alfalfa & Corn	April 1 - October 31	Farmington	$ 190	$ 56,679	298	296	Actual water savings is close to the projected value
Animas River & San Juan River	NM	40	Grass Pasture	April 1 - October 31	Farmington	$ 190	$ 18,103	95	88	Actual water savings is close to the projected value
San Juan River	NM	1,286	Corn, Alfalfa & Beans	March 1 - October 31	Towaoc	$ 217	$ 635,242	2,930	2,895	Actual water savings is close to the projected value
San Juan River**	NM	7	Turf Grass	April 1 - May 31; August 1 - October 31	-	$ 190	$ 7,391	Not Applicable	16	Participant estimated a 16 acre-feet decrease based on the installation of the new automated sprinkler system*
Price River	UT	28	Alfalfa & Oats	March 1 - October 31	Wellington	$ 190	$ 10,992	58	60	Actual water savings is close to the projected value
Price River	UT	371	Alfalfa & Tri-Mix Grain	March 1 - October 31	Wellington	$ 190	$ 175,332	923	915	Actual water savings is close to the projected value
Price River	UT	152	Alfalfa & Grass Pasture	March 1 - October 31	Wellington	$ 190	$ 59,157	311	322	Actual water savings is close to the projected value
Price River	UT	186	Grass Pasture	March 1 - October 1	Wellington	$ 190	$ 70,674	372	416	Actual water savings is higher than the projected value
Price River	UT	159	Alfalfa	June 1 - August 31	Wellington	$ 190	$ 43,341	228	239	Actual water savings is close to the projected value
Price River	UT	27	Alfalfa & Grass Pasture	March 1 - October 31	Wellington	$ 190	$ 12,675	67	68	Actual water savings is close to the projected value
Ferron Creek*	UT	240	Grass Pasture	May 1 - August 31 and October 1 to October 31	Ferron	$ 200	$ 76,248	381	454	Actual water savings is higher than the projected value
Fontenelle Creek	WY	276	Grass Pasture	June 20 - September 30	LaBarge	$ 190	$ 77,330	407	365	Actual water savings is close to the projected value
Fontenelle Creek	WY	492	Grass Pasture	July 1 - September 30	LaBarge	$ 190	$ 102,600	540	561	Actual water savings is close to the projected value
Fontenelle Creek	WY	878	Grass Pasture	July 1 - September 30	LaBarge	$ 190	$ 205,770	1,083	1,062	Actual water savings is close to the projected value
Fontenelle Creek	WY	717	Grass Pasture	July 15 - September 30	LaBarge	$ 190	$ 135,660	714	688	Actual water savings is close to the projected value
Uncompahgre River*	CO	10	Alfalfa, Corn & Clover	January 1 - December 31 Irrigated 1 full day per month May through September	Montrose No. 2	$ 200	$ 4,000	20	25	Actual water savings is higher than the projected value
Uncompahgre River*	CO	12	Alfalfa & Triticale	January 1 - July 14 October 16 - October 31	Montrose No. 2	$ 200	$ 4,800	24	17	Actual water savings is less than the projected value
Colorado River – Grand Valley*	CO	208	Corn & Alfalfa	January 1 - December 31	Grand Junction 6	$ 330	$ 110,220	334	527	Actual water savings is higher than the projected value
Town of Granby	CO	348	Grass Pasture	January 1 - December 31	Frasier	$ 190	$ 44,300	233	285	Actual water savings is higher than the projected value
Colorado River – Grand Valley	CO	1,252	Variety	April 1 - October 31; April 1 - September 30; April 1 - August 31;	Grand Junction 6	$ 163	$ 525,000	3,226	3,407	Actual water savings is close to the projected value

** Indicates a multi-year project that was selected in 2015 or 2016 and included different criteria for reviewing the CU estimates provided in the application due to the initial phase of the SCPP.*

***Project was selected, and costs incurred in 2016, but project activity did not occur until 2017*

Appendix E: System Conservation Pilot Program Consumptive Use Analysis (2018)

Background

The Upper Basin System Conservation Pilot Program, established through the System Conservation Agreement[3], promotes temporary, voluntary, and measurable reduction of consumptive use of Colorado River water. Though the SCPP likely provided benefits to the Colorado River System, its purpose was not to measurably increase levels in Lakes Powell and Mead. Rather, the program was designed to assess various aspects of and identify challenges relating to a program involving temporary, voluntary, and compensated reductions in consumptive use of Colorado River Water. As part of the SCPP, individual project performance is evaluated through project-specific verification plans which include a potential consumptive use analysis—reduced as necessary by water supply limitations—with climate data from a nearby climate station. The purpose of the consumptive use analysis is to quantify the amount of water each project conserved by participating in the System Conservation Pilot Program during the 2018 irrigation season.

As part of the 2018 project selection process, the conserved consumptive use estimates provided in the applications were reviewed, verified, and adjusted if needed. The estimates were generally based on historical averages that accounted for water supply limitations. However, some of the estimates were negotiated based on pending water right court cases or based on documented reports.

Approach

The following simplified approach was used to estimate actual consumptive use savings:

1. **Collect climate data from nearby climate stations.** A nearby climate station was selected for each project. Daily climate data, required for use with the Penman-Monteith method, was reviewed and corrected using ASCE standards as outlined in Appendix D ASCE Manual 70.
2. **Estimate potential consumptive use.** The potential consumptive use for the projects in each state was estimated using the following methods. For consistency, the method used in this analysis—either modified Blaney-Criddle or Penman-Monteith—was selected based on the method used for the application and the availability of meteorological data.
    - **New Mexico** Modified Blaney-Criddle was used to estimate the conserved consumptive use in most of the applications; therefore, Modified Blaney-Criddle was used to estimate potential consumptive for the associated analyses. Hargreaves, calibrated to Penman-Monteith, was used to estimate the conserved consumptive use in one application; therefore, a daily Penman-Monteith calculation was used to estimate potential consumptive use savings for 2018.

[2] "Agreement Among the United States of America, through the Department of the Interior, Bureau of Reclamation, the Central Arizona Water Conservation District, the Metropolitan Water District of Southern California, Denver Water, and the Southern Nevada Water Authority, for a Pilot Program for Funding the Creation of Colorado River System Water through Voluntary Water Conservation and Reductions in Use."

- **Utah –** Modified Blaney-Criddle was used to estimate the conserved consumptive use in the Utah applications and, therefore, was used to estimate potential consumptive use savings for 2018.
- **Wyoming –** Mapping EvapoTranspiration with High Resolution and Internalized Calibration (METRIC) was used to estimate the conserved consumptive use in the applications. Because this method was only used to develop estimates for 2011, a daily Penman-Monteith calculation was used to estimate potential consumptive use savings for 2018.
- **Colorado –** Modified Blaney-Criddle was used to estimate the potential conserved consumptive use in the applications and, therefore, was used to estimate potential consumptive use savings for 2018.

The potential consumptive use estimates were reduced by effective precipitation (per SCS NEH4 guidelines for the Penman-Monteith calculations and the SCS TR-21 method for the Modified Blaney-Criddle calculations) to determine the potential consumptive use from an irrigation water source during the project-specific contracted dates of participation. The calculated consumptive use from an irrigation water source equals the maximum net savings during the fallowing or deficit irrigation period.

3. **Adjust results for water supply limitations.** In general, 2018 represented a bad water supply year with warmer irrigation season temperatures. That meant potential consumptive use was higher than average, while water supply was below average. To account for water supply limitations, the following methods were used to adjust the potential consumptive use estimates based on the available information in each state:
    - **New Mexico** – According to the State Engineers Office, the ditches associated with the New Mexico participants' projects were not supply limited in 2018; therefore, no water supply limitations were applied to the consumptive use estimate.
    - **Utah –** Participant-provided diversion records, as well as state records, were used to determine supply limitations for Utah projects in 2018. Even though 2018 was a dry year in Utah, full reservoirs helped mitigate the low streamflow for many Utah participants. Two canal companies provided records on water delivered to the end of the canal in lieu of delivery to participants in 2018. The amount delivered less estimated irrigation application losses was used instead of Modified Blaney-Criddle for participants under those two canals. Application losses ranged from 40% for flood to 20% for sprinkler. The application losses accounted for losses that would have occurred if the water had been used to irrigate a field. Supply limitations were calculated as the difference between the irrigation water requirement (IWR) and the amount delivered less estimated application losses. If the amount delivered less application losses was greater than the IWR, then it was assumed that the participant got a full supply.
    - **Wyoming –** Wyoming had an average hydrologic year after receiving more snowpack than the other three upper division states in 2018. Diversion records are not recorded unless a ditch is being administered; however, because streamflow indicated that it was an average hydrologic year, the consumptive use estimates were adjusted by the average historical shortage.
    - **Colorado –** Streamflow records indicated that 2018 streamflow was similar to 2002 and 2012 streamflow, falling somewhere in the middle of the two years. Diversion records from 2002 and 2012 for the participating project ditches were reviewed to see if/when the ditches went out of priority. Supply limitations for 2018 were based on the ditches average shut off date for 2002 and 2012.

Results

Results from the consumptive use analyses are provided in Table E.1. In the observations column, "Actual water savings is close to the projected value" indicates the results from this analysis were within 10 percent of the projected conserved consumptive use estimate. "Actual water savings is higher/less than the projected value" indicates the results from this analysis were more/less than 10 percent of the projected conserved consumptive use estimate. Participants that receive a full supply were generally higher than the projected value in 2018 because of the warmer than average irrigation season. For example, in 2018, the San Juan project's estimated actual water savings was roughly 38 percent larger than the projected conserved consumptive use. Participants that are often supply limited showed conserved consumptive use lower than the projected value because of the dryer hydrologic conditions. Porcupine Ridge Ranch, for example, projected conserved consumptive use was 42 percent less than the estimated actual water savings. Note that differences in water savings from what was projected can be due to weather variations from average conditions, water supply variations from average conditions, or both.

Table E.1. The 2018 Estimated Conserved Consumptive Use (CCU) Results

Tributary Name	State	Total Acreage	Crop	Dates of Fallowing or Deficit Irrigation (2018)	Selected Climate Station	Cost per acre-foot	Total Cost for 2018	Estimated CCU per Application (acre-feet)	Estimated CCU per Analysis (acre-feet)	Observations
Egeria Creek	CO	1,941	Grass Pasture	May 1 - October 31	Yampa	$ 150	$ 421,650.00	2,811	1,633	Actual water savings is less than the projected value
Tomichi Creek	CO	721	Grass Pasture	July 1 - September 30 with one field receiving a 10 day irrigation	Gunnison	$ 79	$ 50,000.00	631	411	Actual water savings is less than the projected value
Uncompahgre River*	CO	10	Alfalfa, Corn & Clover	January 1 - December 31 Irrigated 1 full day per month May through September	Montrose No. 2	$ 200	$ 4,000.00	20	36	Actual water savings is higher than the projected value
Uncompahgre River*	CO	12	Alfalfa & Triticale	January 1 - July 14 October 16 - October 31	Montrose No. 2	$ 200	$ 4,800.00	24	28	Actual water savings is higher than the projected value
Animas River & San Juan	NM	64	Alfalfa	April 1 - October 31	Farmington	$ 150	$ 25,281.00	169	197	Actual water savings is higher than the projected value
Animas River & San Juan	NM	154	Alfalfa & Corn	April 1 - October 31	Farmington	$ 150	$ 53,775.00	358	436	Actual water savings is higher than the projected value
San Juan	NM	1,656	Variety	March 1 - October 31	Towaoc	$ 219	$ 793,984.50	3,626	5,015	Actual water savings is higher than the projected value
Two Mile Creek	UT	250	Alfalfa Grass Mix	April 15 - October 31	La Sal	$ 150	$ 27,516.00	183	130	Actual water savings is less than the projected value
Price River	UT	1,199	Variety	March 1 - October 31 or July 1 to September 1 or Crop Switch	Price	$ 150	$ 347,014.50	2,317	1,306	Actual water savings is less than the projected value
Price River	UT	50	Alfalfa	April 10 - October 31	Price	$ 140	$ 17,663.80	126	124	Actual water savings is close to the projected value
Price River	UT	51	Alfalfa	April 10 - October 31	Price	$ 140	$ 18,016.60	129	114	Actual water savings is less than the projected value
Price River	UT	9	Alfalfa	April 10 - October 31	Price	$ 140	$ 3,031.00	22	29	Actual water savings is higher than the projected value
Price River	UT	53	Alfalfa and Grass Pasture	April 10 - October 31	Price	$ 140	$ 18,487.00	132	64	Actual water savings is less than the projected value
Ferron Creek*	UT	240	Grass Pasture	May 1 - August 31 and October 1 - October 31	Ferron	$ 200	$ 76,248.00	381	516	Actual water savings is higher than the projected value
Cottonwood Creek	WY	1,407	Grass Pasture	July 15 - September 30	Daniel/Budd Ranch	$ 150	$ 144,966.50	966	1,397	Actual water savings is higher than the projected value
Fontenelle	WY	2,552	Grass Pasture	June 20 - September 30	LaBarge	$ 150	$ 463,012.50	3,087	3,726	Actual water savings is higher than the projected value
Horse Creek	WY	616	Grass Pasture	July 5 - September 30	Daniel	$ 150	$ 135,048.00	900	796	Actual water savings is less than the projected value
Middle and South Piney Creek	WY	4,777	Grass Pasture	July 15 - October 15	Budd Ranch	$ 150	$ 740,430.00	4,936	5,858	Actual water savings is higher than the projected value
Green River	WY	1,057	Grass Pasture	July 20 - September 30	Budd Ranch	$ 150	$ 101,700.00	678	1,432	Actual water savings is higher than the projected value
Muddy Creek	WY	151	Grass Pasture	July 15 - September 30	Budd Ranch	$ 150	$ 19,050.00	127	175	Actual water savings is higher than the projected value
North Piney Creek	WY	3,183	Grass Pasture	July 1 - September 30	Budd Ranch	$ 150	$ 486,015.00	3,240	3,726	Actual water savings is higher than the projected value

Tributary Name	State	Total Acreage	Crop	Dates of Fallowing or Deficit Irrigation (2018)	Selected Climate Station	Cost per acre-foot	Total Cost for 2018	Estimated CCU per Application (acre-feet)	Estimated CCU per Analysis (acre-feet)	Observations
North Cottonwood Creek	WY	555	Grass Pasture	June 15 - October 11	Daniel	$ 150	$ 98,850.00	659	655	Actual water savings is close to the projected value

** Indicates a multi-year project that was selected in 2016 and included different criteria for reviewing the CU estimates provided in the application due to the initial phase of the SCPP.*