

CONSERVATION IMPACTS STUDY

Understanding the potential impact of water conservation on water resource planning and the timing of large water development projects.

September 2020



INTRODUCTION

Water resource planning and development is a topic of great interest to the stakeholders concerned about the future of Great Salt Lake. **How water is used upstream has significant impact on the quantity and quality of water reaching the lake.** To inform future water resource planning decisions that may affect the lake, the purposes of this study are to:

- Examine the potential impacts of water conservation on water resource planning.
- Develop an action plan of additional studies needed to assist policy makers in more completely understanding the role of conservation in future water resource planning.

One important component of this project is understanding the potential impact of water conservation on the timing of the Bear River Development project. In 1991, this major water development project was initially projected to be needed as early as the year 2015. Since then, agricultural conversions, water conservation, and some smaller water development projects have significantly delayed the projected need for the project. If additional water conservation efforts can significantly decrease water use, there is the potential to further delay or reduce the magnitude of large water development projects such as the currently defined Bear River Development project.

POTENTIAL IMPACTS OF CONSERVATION BASED ON AVAILABLE DATA

This evaluation focuses on four primary water providers in northern Utah: Bear River Water Conservancy District (WCD), Cache Water District, Jordan Valley WCD, and Weber Basin WCD. These water providers have been selected for analysis because they have indicated an expected need for significant additional future water supply, including participation in, and delivering water from the Bear River Development project.

The following four figures summarize projected supply¹ and demand for each of these districts for various levels of per capita water use: historical use (from 2005 or earlier)², current use³, and use at current regional water conservation goals as defined by the State or Utah Division of Water Resources⁴. Where applicable, the figures also show the additional conservation that would be needed to postpone the Bear River Development project beyond the current planning window of 2065.

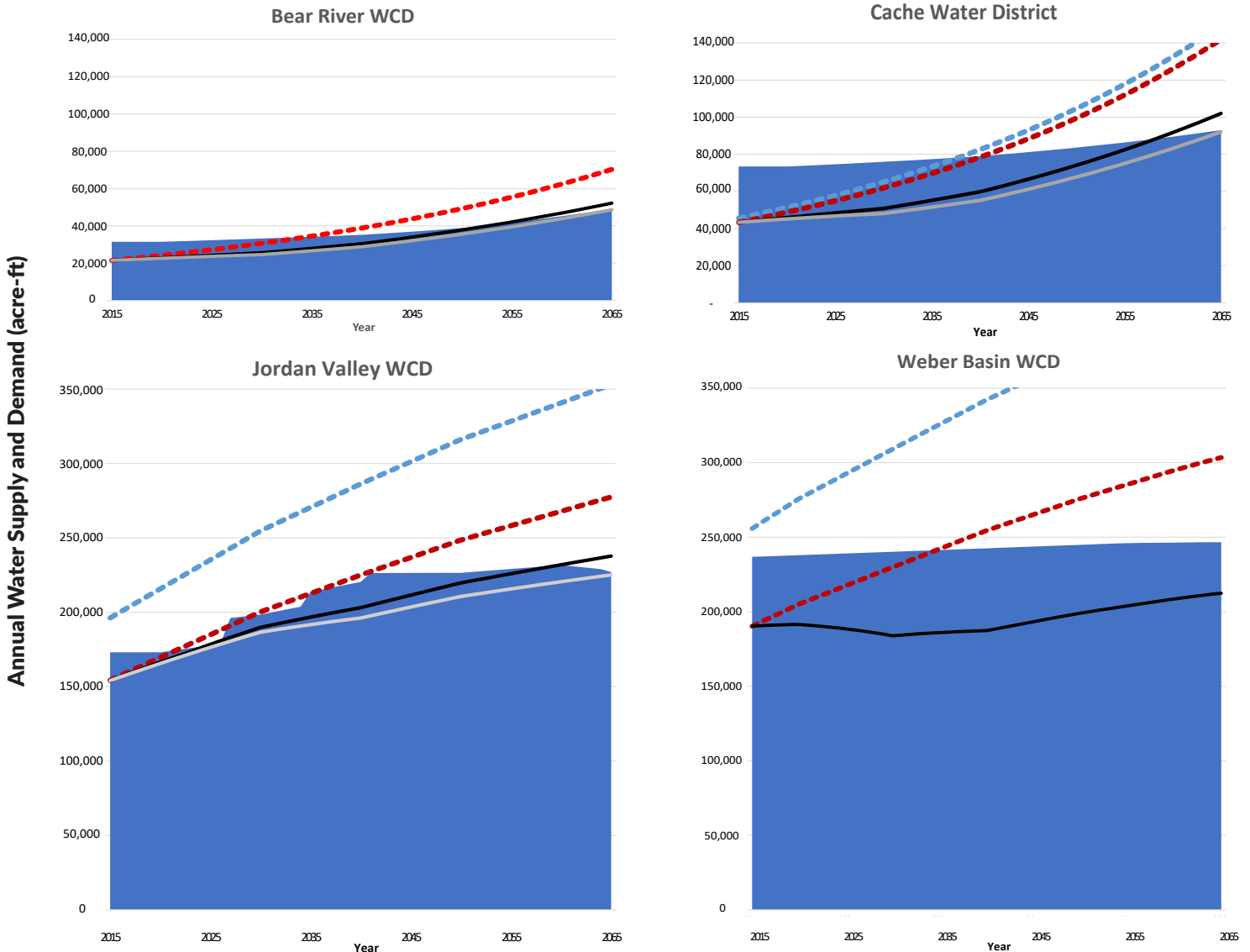
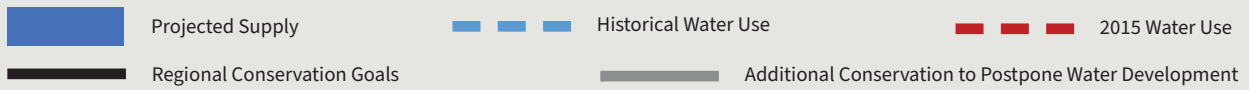
¹ Supply as defined in the master plans for each district. Includes maximizing use of existing sources, development of some smaller new sources, and a conservative estimate of water converted from agricultural uses to M&I as part of development activities, but does not include any water from the Bear River Development project. Both supply and demand consider the effects of climate change based on the limited, but best information available. It should be noted that two different population projection alternatives were considered for Bear River and Cache. For space reasons, only the more conservative aggressive growth scenario is shown here.

² Utah Division of Water Resources 2005 Municipal and Industrial Water Use Database. Note that there is some question as to the accuracy of historical use data for Bear River WCD. Correspondingly, this data has not been shown.

³ "Current" use based on 2015 data - Utah Division of Water Resources 2015 Municipal and Industrial Water Use Database

⁴ Utah's Regional M&I Water Conservation Goals (Hansen Allen & Luce / Bowen Collins & Associates, Nov. 2019)

LEGEND



CONCLUSIONS FROM SUPPLY AND DEMAND FIGURES

- Conservation efforts to date have significantly delayed the need for future water development projects.
- Meeting the current Utah Division of Water Resources Regional Water Conservation Goals could significantly postpone the need for future water supply development projects.
- To postpone water development projects beyond 2065, all entities except the Weber Basin Water Conservancy District will require additional conservation beyond the regional goals.

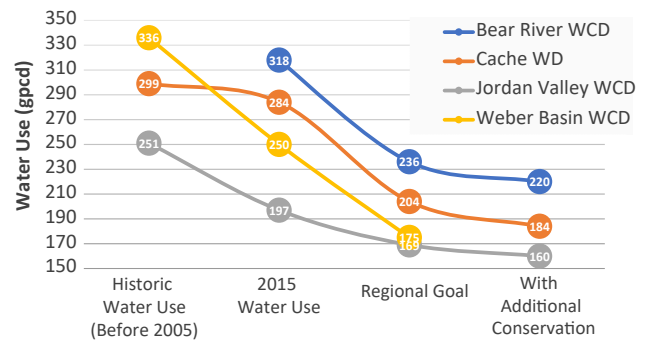
Water use in each District for various levels of conservation and the resulting impact on Bear River Development timing are as follows:

Impact of Water Conservation on Timing of Expected Need for Bear River Development

	Historic Water Use (Before 2005)	2015 Water Use	Regional Goals	With Additional Conservation
Bear River WCD	2035	2035	2055	> 2065
Cache WD	2040	2045	2055	> 2065
Jordan Valley WCD	2010	2040	2060	> 2065
Weber Basin WCD	2010	2035	> 2065	> 2065

Per Capita Water Use With Conservation (gallons per day)

	2015 Water Use	2065 Regional Conservation Goal	% Reduction from 2015 to Regional Goal	Additional Conservation Needed to Postpone Bear River Project	% Reduction from 2015 to Additional Conservation
Bear River WCD	318	236	25.8%	220	30.8%
Cache WD	284	204	28.2%	184	35.2%
Jordan Valley WCD	197	169	14.2%	160	18.8%
Weber Basin WCD	250	175	30.0%	175	30.0%
Weighted Average	232	181	22.1%	173	25.4%

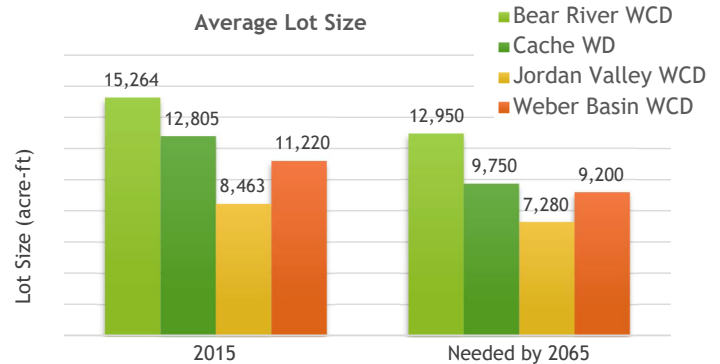
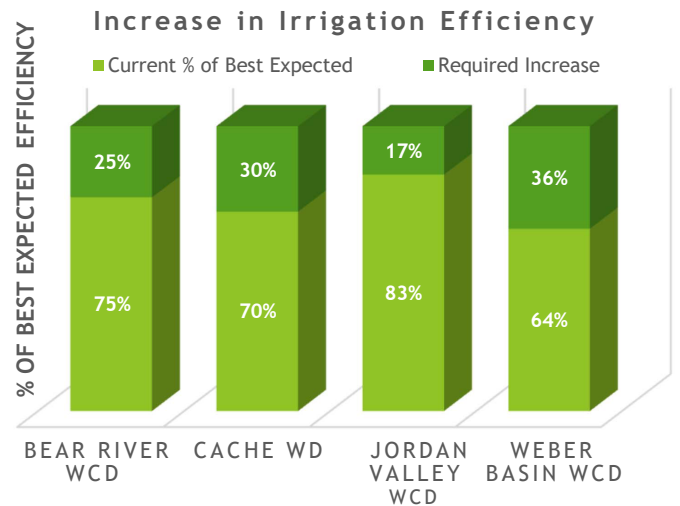


REQUIRED CONSERVATION TO POSTPONE BEAR RIVER DEVELOPMENT PROJECT

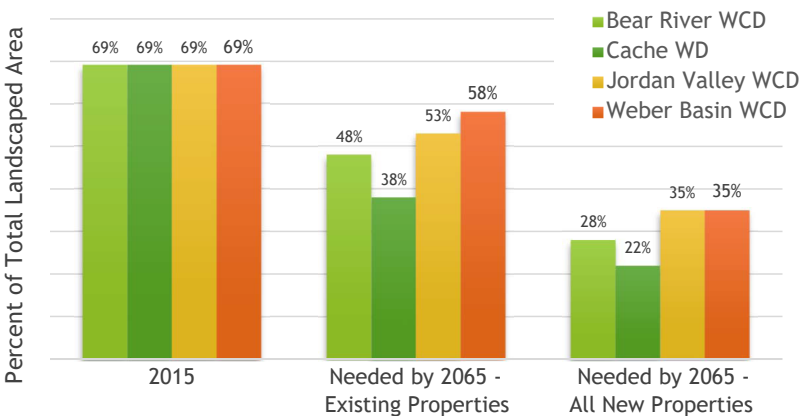
If Utahns want to achieve the level of conservation required to postpone the Bear River Development project beyond 2065, **it will require some dramatic changes to current water use habits.** Reaching this level of conservation will require active participation and acceptance by homeowners, businesses, municipalities, and legislators. Required actions to achieve this level of conservation include:

- Near 100% conversion of all indoor fixtures to high efficiency (including faucets, showers, toilets⁵, and washing machines)
- 50% reduction in indoor leaks and other indoor water waste
- Near 100% implementation of secondary water metering
- Increase in irrigation efficiency to near 100% of best expected⁶ (see figure).
- Average lot size⁷ reduced by 14% to 24%⁸ (see figure).
- Significant reduction of high water use turf grasses to other waterwise options, including conversion of existing residential landscapes and limited use of high water use turf grasses on all new development (see figure).

While some of these changes will not be difficult for Utah residents (e.g. conversion to high efficiency fixtures), others represent **a major change in the traditional approach to development** (e.g. reducing average residential lot size by 24% or limiting cool-season turfgrasses to 20% of landscaped areas).



Use of Cool-season Turf Grasses



⁵ Assumes 25% of toilets will meet current high efficiency standards (1.6 gallons/flush) with remaining 75% meeting ultra high efficiency standards (1.28 gallons/flush)

⁶ This is 100% of best expected, not 100% efficiency. It is not reasonable to expect that all irrigation systems can be run at 100% efficiency all the time. Best expected has been based on 70% total efficiency for sprinkler systems and 80% total efficiency for drip systems.

⁷ Average lot size should not be confused with new lot size. To bring the overall average lot size down across each district, the average size of new lots will need to be significantly smaller the values shown.

⁸ There are an infinite number of combinations between lot size and % of turf grass that could be considered. If lot size is further decreased in any District, the percentage of allowable turf grass could be correspondingly increased. The values shown are for one example scenario.

FUTURE STUDIES ACTION PLAN

The analysis contained here is based on the best available data but is missing important considerations in many areas. While the analysis contained here may provide some insight into the role of conservation in future water supply and demand planning, **additional analysis is needed to inform policy makers** before any firm decisions regarding future water development can be made.

As part of this project, input regarding additional needed study in this area was secured from stakeholders in the water industry (both agricultural and M&I), environmental interests, and state regulatory agencies. The following action plan is a summary of the most highly recommended studies based on the input received and observations during the study regarding **what additional information is needed to make informed water resource planning decisions**. Because this plan includes needed study at multiple levels, it is unlikely that any single entity will be able to implement the full action plan. Instead, it is recommended that stakeholders work together to complete their applicable portions of the action plan to provide a more complete water resources planning picture. Leadership at the state level is recommended to coordinate these efforts.



CONSERVATION IMPACTS STUDY ACTION PLAN

PRIORITY 1

Water Conservation Impacts Study Continued (Expanded Scope)

STUDY KEY ELEMENTS

- Refine Water Supply Data (Current and Future)
- Further Study Population Growth and Land Use Change Interactions, Especially in More Rural Areas
- Study Regional Water Supply Sharing
- Study and Refine Regional Water Demand Numbers

PRIORITY 2

Agricultural Water Conversion Study

STUDY KEY ELEMENTS

- Better Quantify Agricultural Conversion Potential within Study Area
- Evaluate Agricultural Conversion Impacts on Future Municipal Water Supply
- Consider Agricultural Water Efficiency Impacts on Conversion Quantity

PRIORITY 3

Cost of Water Conservation Study

STUDY KEY ELEMENTS

- Estimate Cost Range of Municipal Water Conservation Efforts
 - * Compare total conservation costs to costs of large water project development
- Rank Conservation Efforts by Cost
 - * Identify low hanging fruit for water conservation

PRIORITY 4

Study of Water Use and Conservation Behaviors

STUDY KEY ELEMENTS

- Answer the questions:
- What are the drivers to municipal water use behavior changes?
 - What market forces could best encourage conservation?
 - What is public's receptiveness for higher levels of water conservation?
 - What public relations or outreach strategies will be most effective?