

UTAHNS' VISION FOR 2050

# WATER



**Envision  
Utah**

*Your Utah,  
Your Future*



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UTAHNS' VISION FOR 2050

# WATER



YOUR UTAH, YOUR FUTURE

# PROCESS

## UTAH IS GROWING.



### TODAY

There are three million people living in Utah.

### 2050

By 2050 there will be 5.4 million—the population will nearly double in 35 years!

THAT MEANS

# 2 x the

HOMES    JOBS    SKIERS  
CARS    STUDENTS    FOOD

## OUR GOAL

HELP UTAHNS CREATE A VISION FOR UTAH'S FUTURE



### 11 TOPICS

Utahns' values guided the selection of 11 topics critical to the future of Utah.



### UTAHNS' VALUES

Values studies told us not just what Utahns care about, but why they care about those things.



### ACTION TEAMS

Experts from across the state studied the topics and helped shape potential scenarios for the future.

### SCENARIOS



### 8 ACTION TEAMS

OF 400 EXPERTS WORKED FOR 18 MONTHS TO DEVELOP POTENTIAL SCENARIOS FOR UTAH'S GROWTH ACROSS EACH TOPIC.

### YOUR UTAH, YOUR FUTURE SURVEY



### 53,000 UTAHNS

WEIGHED IN ON EACH TOPIC AND EACH SCENARIO, TELLING US WHAT THEY WANT UTAH TO LOOK LIKE IN 2050.

### VISION FOR 2050



### A COMBINATION

OF SURVEY RESULTS, VALUES, AND ACTION TEAM INPUT FORMED A VISION FOR UTAH'S FUTURE.

*With careful planning and stewardship, Utahns can have enough water to support agriculture, wildlife, and recreation and still provide sufficient water to meet the needs of growing communities.*

## INTRODUCTION

**WATER IS AN ESSENTIAL BUT LIMITED RESOURCE.** Because water sustains nearly everything Utahns hold dear, there are competing demands for the state's precious water supply. Utahns want water to be plentiful, readily available, and affordable in order to support food production, community growth, and economic development. They also desire to be good stewards of the environment and want an abundance of clean water available to sustain their natural surroundings.

**AS UTAH ADDS ANOTHER 2.5 MILLION PEOPLE BY 2050, MORE WATER WILL BE NEEDED TO SUPPORT THE POPULATION GROWTH.** These water supplies can come from some combination of three sources: conservation, local water projects (including conversions from agriculture to urban use), and large regional water projects. Utahns are willing to significantly reduce how much water they use, but they do not want new water supplies to diminish their ability to produce food in Utah or to come at the expense of wildlife or recreation. With careful planning and stewardship, Utahns can have enough water to support agriculture, wildlife, and recreation and still provide sufficient water to meet the needs of growing communities.

YOUR UTAH, YOUR FUTURE

# VISION FOR WATER

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## THE VISION

Utahns envision having clean, affordable water to support thriving communities and businesses, robust local agriculture, a healthy environment, and recreation. Even as the population grows, they see having enough water to support not only themselves but future generations. They envision using less water in their homes, businesses, and yards, so there is sufficient water for other uses like food production and habitat, as well as for new homes and businesses.



## GOALS

- 1** Ensure future generations have sufficient water to sustain Utah's population and a strong economy.
- 2** Use less water per person.
- 3** Provide enough water for agriculture to allow farms to thrive and increase food production.
- 4** Ensure water in streams and lakes is sufficient to sustain wildlife and recreation.
- 5** Maintain and improve water quality and groundwater storage in watersheds.
- 6** Balance the diverse needs for water.

## KEY STRATEGIES

- 1** Extend Utah's 2025 goal of reducing per-capita water use by 25% (from 2000) to at least 35% by 2050.
- 2** Reduce outdoor watering by meeting market demand for more houses on smaller lots, townhomes, condominiums, apartments, etc.
- 3** Allow, encourage, and incentivize water-wise landscaping and irrigation practices.
- 4** Significantly reduce the amount of agricultural water being converted to urban uses.
- 5** Improve water quality and groundwater storage by improving Utah's watersheds (e.g., by eradicating invasive species, replanting native grasses and trees, and improving grazing practices).
- 6** Adequately maintain, and replace where needed, existing water infrastructure.
- 7** Prepare for and develop new water supplies as needed.

For more details on these and other strategies, see the recommended strategies section beginning on p. 33.

BACKGROUND:

# WHERE WE ARE TODAY

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**WE NEED WATER TO DRINK, GROW FOOD, GENERATE POWER, MAKE ESSENTIAL PRODUCTS, PROVIDE JOBS, ATTRACT BUSINESSES TO UTAH, SUPPORT RECREATION AND TOURISM, AND SUSTAIN THE NATURAL ENVIRONMENT.**

With an arid southern region, Utah averages out to be the second driest state in the nation. In addition, the state receives very little moisture during the summer months compared to other places like Phoenix and Albuquerque. As a result, green yards, parks, and farms in Utah require more water. As the population grows by another 2.5 million people, Utahns will have to carefully plan and make hard choices about how to supply sufficient water to expanding cities and towns. These choices will also determine if there is enough water to promote jobs and economic development, feed the growing population, and protect the environment. In addition to the challenges of growth, the water infrastructure that serves the present population will need to be repaired and replaced at rates and at a cost never before experienced. For these reasons, water is among Utahns' top concerns when they look to the future.

Providing water to an additional 2.5 million people will require increasing the state's water supply through some combination of different methods:

- 1 Reducing per-capita water use.
- 2 Developing local projects such as wells, conversion of agricultural land and water to urban uses, additional storage, artificial groundwater recharge, treatment plants, pipelines, and watershed improvements.
- 3 Building the two larger projects that would divert water from the Bear and Colorado Rivers. Because these two rivers flow through multiple states, these states have entered into agreements that divide the water among them; these projects would utilize Utah's remaining allocations from these rivers.

Reducing the amount of water used for homes, landscaping, and businesses can delay the need for new water development projects.

Utahns currently use about 240 gallons of water per person each day for homes, yards, and businesses. Governor Herbert has set a statewide goal to use 25% less water per person by 2025 from 2000 levels. Utah has made significant strides in reaching this goal. Most areas of the state are already conserving 15% or more. In parts of southern Utah, conservation levels have reached 35%.

Some water for communities will likely come from agricultural lands. When agricultural lands are sold for urban development, the city or water agency in which the development occurs typically acquires the water used on that land. If Utah continues to grow as it has over the past 20 years, the state could lose up to 13% of its irrigated agricultural land by 2050, including 45% of Utah's land used to grow fruits and vegetables and 60% of Utah's orchards. Much of that land is prime farmland along the Wasatch Front with soils and climates that don't exist elsewhere in the state. Converting too much agricultural water to urban use will therefore erode

Utahns' ability to provide food to the state's growing population. In addition, treating agricultural water to make it suitable for human consumption can be expensive.

As we plan our water supplies for existing and new users, Utahns must also plan for periods of drought and climate variability. Utah frequently experiences droughts that last for years. Although snowpack currently provides most of Utah's water storage, climate models from Utah State University predict that northern Utah may become warmer, causing more precipitation to fall as rain instead of snow. Even though overall precipitation may remain the same, Utahns' water storage in snowpack will decrease. These same climate models also predict that southern Utah could become warmer and drier. As the state's climate changes, developing additional storage and maintaining healthy watersheds to absorb and slowly release water will become increasingly critical.

## CHANGE IN LOT SIZE



1998  
0.32 acres



2013  
0.25 acres

*22% decrease along the Wasatch Front*

Most areas of the state are already consuming 15% less water than in 2000. This has been driven in part by a market trend toward smaller lot sizes.

## CHANGE IN LANDSCAPING



*Conventional Utah landscape*



*Utah landscape with a 25% per capita reduction in water use*

While lot sizes continue to decline, we will have to consider what we grow on those lots. Most turf grass requires a lot of water, so shifting our landscapes to native or low-water plants will reduce consumption.

HOW WE CREATED A VISION:

# PEOPLE AND PROCESS

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**TO CREATE A VISION FOR THE FUTURE OF WATER IN UTAH, A TEAM OF EXPERTS GATHERED OVER A TWO-YEAR PERIOD TO SHARE KNOWLEDGE AND EXTENSIVELY RESEARCH AND DISCUSS OPTIONS FOR UTAH'S WATER FUTURE.**

Members of the State Water Strategy Advisory Team were selected by Governor Gary Herbert and Envision Utah to represent a spectrum of professional experience and political affiliations. Team members included water supply managers, legislators, administrators, farmers, professors, attorneys, advocates, and others from across the state. From 2013 to 2015, the team met to identify Utahns' choices related to water, create scenarios for public input, and synthesize a vision for the future. The State Water Strategy Advisory Team was also tasked with developing a proposed 2060 State Water Strategy, which may contain more detailed strategies than are included in this 2050 vision. The process of creating this vision also consisted of the following components:

- 1 A 2014 values study. This study was conducted by Heart+Mind Strategies to identify (1) what factors Utahns view as affecting their quality of life the most and (2) the underlying emotions and values tied to those factors. The study determined that Utahns view water as a top priority in the state because it is linked to many of the quality-of-life factors that are most important to Utahns. The study also found that Utahns want to ensure there is an adequate supply of clean, affordable water for a variety of needs (agriculture, population growth, jobs, environment, etc.). (More information on the values study can be found in the Utahns' Values section on p. 17.)
- 2 The "Build Your 2050 Utah" web app. This app allowed Utahns to identify behaviors and activities that affect water consumption and supply and interactively learn about the outcomes of making changes to those behaviors. More than 3,000 people across the state gave input through the app. Most expressed that water conservation should be a top priority in order to save water for other uses. Most participants also voiced that climate change should be considered when making decisions concerning the future of the state.

The action team used this information to create five different scenarios for the future of water in Utah. The scenarios differed in the sources of water used to serve the growing population, conservation levels, and allocations among various uses over the next 35 years. These scenarios (p. 21) were presented to the public in the Your Utah, Your Future survey in spring 2015, and 52,845 Utahns weighed in.

After receiving public input on the five water scenarios, the action team met to establish a vision, including goals and strategies, to achieve what Utahns said they wanted for water in 2050.

# ACTION TEAM MEMBERS



## CHAIRS



**TAGE  
FLINT**



*Weber Basin Water  
Conservancy District*



**TIM  
HAWKES**



*Trout Unlimited; Utah House  
of Representatives*



**WARREN  
PETERSON**



*Farmland Reserve, Inc.*

**Walt Baker***Utah Division of Water Quality***Richard Bay***Jordan Valley Water Conservancy District***Todd Bingham***Utah Manufacturers Association***Todd Brightwell***Economic Development Corporation of Utah***Joel Briscoe***Utah House of Representatives***Sterling Brown***Utah Farm Bureau***Charley Bulletts***Paiute Indian Tribe of Utah***Steve Clyde***Clyde Snow Attorneys at Law***Keith Denos***Provo River Water Users Association***Joan DeGiorgio***The Nature Conservancy, Utah Chapter***Stephanie Duer***Salt Lake City Public Utilities***Joanna Endter-Wada***Utah State University***Steve Erickson***Great Basin Water Network***Bob Fotheringham***Cache County Water Manager***Lynn de Freitas***Friends of Great Salt Lake***Robert Gillies***State Climatologist***Keith Grover***Utah House of Representatives***Jodi Hoffmann***Utah League of Cities and Towns***Scott Jenkins***Utah Senate***Kent Jones***State Engineer***Voneene Jorgensen***Bear River Water Conservancy District***JT Martin***IWM Integrated***Dan McCool***University of Utah***Eric Millis***Utah Division of Water Resources***Leland Myers***Central Davis Sewer District***Ralph Okerlund***Utah Senate***Shane Pace***Sandy City Public Utilities***Brad Petersen***Utah Governor's Office of Outdoor Recreation***Dale Pierson***Rural Water Association of Utah***Curt Pledger***Bureau of Reclamation***Gene Shawcroft***Central Utah Water Conservancy District***Mark Sovine***Grand County Water and Sewer District***Ron Thompson***Washington County Water Conservancy District***Jane Whalen***Citizens for Dixie's Future***Jody Williams***Holland and Hart LLP*

WHY WATER MATTERS:

# UTAHNS' VALUES

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In 2014, Envision Utah conducted a statewide values study to identify (1) what factors Utahns view as affecting their quality of life the most and (2) the underlying emotions and values tied to those factors.

**UTAHNS WANT  
CLEAN WATER TO  
SUSTAIN HUMAN  
LIFE AND PROTECT  
THE ENVIRONMENT;  
THEY ALSO WANT  
SUFFICIENT WATER  
TO GROW FOOD,  
COMMUNITIES, AND  
THE ECONOMY.**

Utahns primarily value having safe and secure communities, a strong economy with an affordable cost of living, and beautiful surroundings in which to enjoy time with family and friends. Water—and how we manage it—affects all of these three overarching values. Safe, clean water improves Utahns' sense of security. Affordable water that is available for a variety of uses promotes economic growth. And plentiful, clean water in lakes and streams supports habitats and recreation.

Specifically concerning water, Utahns value having plentiful, readily available, and affordable water for a variety of economic uses, with strong emphasis on local food production and community growth. They believe this will lead to economic growth, better communities, and financial security. They also value having clean water to sustain Utah's natural beauty and improve the environment for plants and wildlife. This creates a feeling of responsible stewardship of natural resources and the planet.

## WATER AND FINANCIAL SECURITY



*“I want water strategies that ensure plentiful water for food production, community growth, and economic development. Readily available water leads to a lower cost of living, better communities, and a sense of financial security.”*

## WATER AND STEWARDSHIP



*“I want clean water for nature and the environment because it sustains life and contributes to healthy living. This makes me feel like a better steward of my state and leads to less stress and a sense of enjoyment.”*

CHOICES FOR THE FUTURE:

# SCENARIO SUMMARIES

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The following scenarios were created by the State Water Strategy Advisory Team to represent possible outcomes for Utah's water in 2050. The scenarios differed in the following variables:

- Sources of water used to serve growing population
- Water conservation levels
- Allocations among various uses over the next 35 years

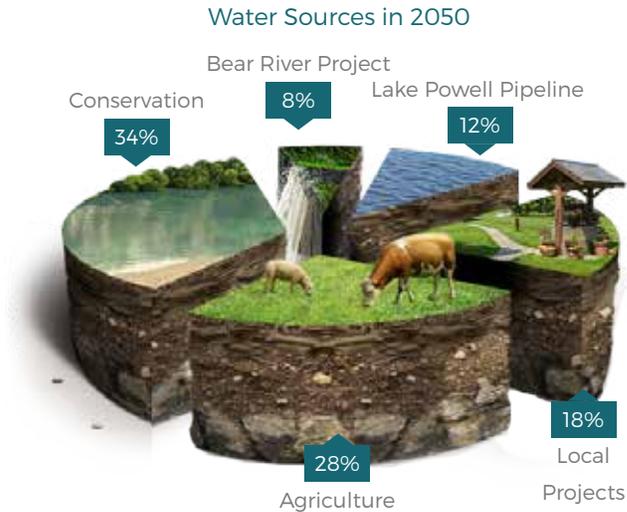
The scenarios were presented to the public as part of the Your Utah, Your Future survey in spring 2015.

The scenarios were titled Allosaurus, Bonneville Trout, Seagull, Quaking Aspen, and Segó Lily (the state fossil, fish, bird, tree, and flower).

THE TWO MOST FAVORED SCENARIOS WERE QUAKING ASPEN, WHICH WAS SELECTED BY 33% OF UTAHNS, AND SEGO LILY, WHICH WAS SELECTED BY 24%. (SEE P. 29.)

## ALLOSAURUS SCENARIO

*25% less use per person; new supply from projects and farms; max 30% grass in yards/parks*



Water use per person decreases by 25% from today's levels, which is 35% less than what was used in 2000. To supply water to our growing population, we build local water projects (wells, tanks, treatment plants, pipelines, efficiency improvements, etc.). We also build both the Lake Powell Pipeline to serve southwestern Utah and the Bear River Project to serve the Wasatch Front. These projects would use Utah's remaining rights to the Colorado and Bear Rivers. Because of reduced demand through water conservation and the significant amount of water taken from agriculture, all or portions of the Bear River Project may be delayed until

closer to 2050, though the Lake Powell Pipeline may still be required in the near term. A significant amount of our water also comes from agricultural lands that are replaced by homes and businesses as our communities grow. In addition, we buy more water from working farms, putting those farms out of production unless we spend money for improved technologies and other means of protecting food production. By 2050, sufficient water will either be developed or taken from other uses to satisfy new demands and to provide some reserve capacity for protection against droughts.

### WATER USE PER PERSON DECREASES BY 25% BECAUSE:

- Businesses use about 25% less water per job than today.
- We use 25% less water indoors and outdoors.
- Landscaping in yards and public open spaces is a maximum of 30% grass.
- Water use is discouraged through significantly higher water rates.

**WATER USE PER PERSON REMAINS THE SAME AS TODAY BECAUSE:**

- Businesses use the same amount of water per job as today.
- We use the same amount of water indoors and outdoors as today.
- Water use for yards, parks, and other public spaces does not change.

## BONNEVILLE TROUT SCENARIO

*Same use per person as today; new supply from projects and farms*

### Water Sources in 2050

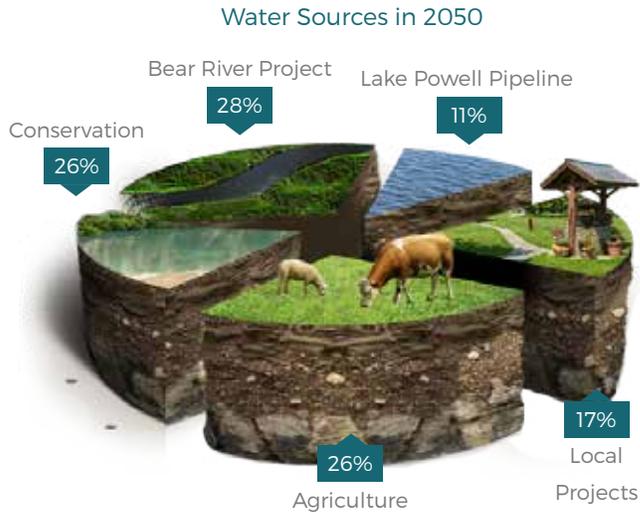


Water use per person remains the same as today, which is 15% less than what was used in 2000. To supply water to our growing population, we build local water projects (wells, tanks, treatment plants, pipelines, efficiency improvements, etc.). In the near term, we also build both the Lake Powell Pipeline to serve southwestern Utah and the Bear River Project to serve the Wasatch Front. These

projects would use Utah's remaining rights to the Colorado and Bear Rivers. A significant amount of our water also comes from agricultural lands that are replaced by homes and businesses as our communities grow. By 2050, sufficient water will be either developed or taken from other uses to satisfy new demands and to provide some reserve capacity for protection against droughts.

## SEAGULL SCENARIO

*15% less use per person; new supply from projects and farms; max 50% grass in yards/parks*



Water use per person decreases by 15% from today's levels, which is 25% less than what was used in 2000. To supply water to our growing population, we build local water projects (wells, tanks, treatment plants, pipelines, efficiency improvements, etc.). We also build the Lake Powell Pipeline to serve southwestern Utah and the Bear River Project to serve the Wasatch Front. These projects use Utah's

remaining rights to the Colorado and Bear Rivers. A significant amount of our water also comes from agricultural lands that are replaced by homes and businesses as our communities grow. By 2050, sufficient water will be either developed or taken from other uses to satisfy new demands and to provide some reserve capacity for protection against droughts.

### WATER USE PER PERSON DECREASES BY 15% BECAUSE:

- Businesses use about 15% less water per job than today.
- We use 15% less water indoors and outdoors.
- Landscaping in yards and public open space use a maximum of 50% grass.

**WATER USE PER PERSON  
DECREASES BY 25% BECAUSE:**

- Businesses use about 25% less water per job than today.
- We use 25% less water indoors and outdoors.
- Landscaping in yards and public open spaces uses a maximum of 30% grass.
- Water use is discouraged through higher water rates and regulatory restrictions.

## QUAKING ASPEN SCENARIO

*25% less use per person; new supply from projects, little from farms; max 30% grass in yards/parks*



Water use per person decreases by 25% from today's levels, which is 35% less than what was used in 2000. To supply water to our growing population, we build local water projects (wells, tanks, treatment plants, pipelines, efficiency improvements, etc.). We also build both the Lake Powell Pipeline to serve southwestern Utah and the Bear River Project to serve the Wasatch Front. These projects would use Utah's remaining rights to the Colorado and Bear Rivers. Because of reduced demand through

water conservation, all or portions of the Bear River Project may be delayed for a decade or more, though the Lake Powell Pipeline may still be required in the near term. As homes and businesses replace agricultural lands, the water from those farms is moved and used to develop new farmland, if such lands can be found. By 2050, sufficient water will either be developed or taken from other uses to satisfy new demands and to provide some reserve capacity for protection against droughts.

## SEGO LILY SCENARIO

*40% less use per person; new supply from local projects and farms; almost no grass in yards/parks*



Water use per person decreases by 40% from today's levels, which is 50% less than what was used in 2000. To supply water to our growing population, we build local water projects (wells, tanks, treatment plants, pipelines, efficiency improvements, etc.). Because of dramatic conservation and the significant amount of water supplied from agriculture, we do not need to build the Bear River Project to serve the Wasatch Front before 2050. A significant amount of our water also comes from agricultural lands that are

replaced by homes and businesses as our communities grow. In addition, we buy more water from working farms, putting those farms out of production unless we spend money for improved technologies and other means of protecting food production. By 2050, sufficient water will either be developed or taken from other uses to satisfy new demands and to provide some reserve capacity for protection against droughts except in southwestern Utah, which may not have sufficient water supply beyond 2045.

### WATER USE PER PERSON DECREASES BY 40% BECAUSE:

- Businesses use about 40% less water per job than today.
- We use 40% less water indoors and outdoors.
- Very little grass is used in landscaping for yards and public open spaces.
- Water use is discouraged through significantly higher water rates and strict regulatory restrictions.

**In this scenario, we do not build the Lake Powell Pipeline to serve southwestern Utah.** Instead, all water from irrigated farms in Washington and Kane Counties is bought by communities. However, **there is still not enough water for southwestern Utah to grow as projected beyond 2045**, which will inhibit job and economic growth well before 2045.

If we use only water from farms that are replaced by homes and businesses, there will not be enough water for southwestern Utah to grow as projected beyond the late 2030s. Without the Lake Powell Pipeline, the area cannot accommodate 50,000 to 130,000 of the residents projected to live there in 2050.

YOUR UTAH, YOUR FUTURE

# SURVEY RESULTS

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In April and May 2015, 52,845 Utahns shared their voice through the Your Utah, Your Future survey. Participants chose their favorite scenarios for water and other topics. After choosing their favorite scenarios, survey participants had the option to answer a series of questions to prioritize water among other issues, determine the most important outcomes related to water, and identify how willing they would be to take specific actions to ensure those outcomes. The survey results were cross-checked against a random-sample survey to ensure they represented the desires and opinions of Utahns.

1

### WHAT UTAHNS WANT FOR WATER

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Utahns consistently rate water as one of the state's top three priorities for 2050. On average, Utahns prefer to reduce overall consumption by 23% per capita between now and 2050. Because we have already conserved significantly over the past several years, this additional conservation effort would result in over 35% less water use per person between 2000 and 2050. Utahns want to build regional water development projects, but after taking significant measures to delay them through conservation. Utahns are not willing to shift significant amounts of water from agriculture to urban uses or remove all grass from their yards or open spaces.

2

### WHY UTAHNS WANT IT

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Utahns want to balance water demands so that future generations (their own children and grandchildren) have sufficient water for their families, the economy, food production, wildlife, and recreation.

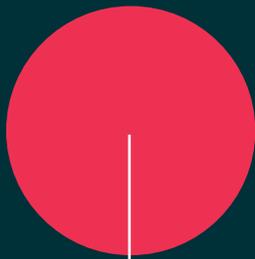
3

### WHAT UTAHNS ARE WILLING TO DO

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Utahns are very willing to take significant steps to reduce how much water they use, even at some personal expense, including changing their landscaping and irrigation systems, having smaller yards, and having less grass in yards, public parks, and other open spaces. They are also willing to fund the development of local and large-scale water projects after making significant conservation efforts.

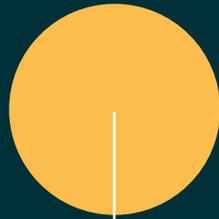
## WHAT UTAHNS WANT



33%

*25% less use per person;  
new supply from projects,  
little from farms; max  
30% grass in yards/parks*

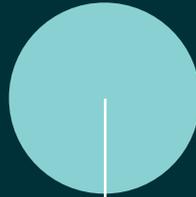
Quaking Aspen



24%

*15% less use per person;  
new supply from projects  
and farms; max 50%  
grass in yards/parks*

Seagull



20%

*40% less use per person;  
new supply from local  
projects and farms; almost  
no grass in yards/parks*

Sego Lily



13%

*Same use per person as  
today; new supply from  
projects and farms*

Bonneville Trout



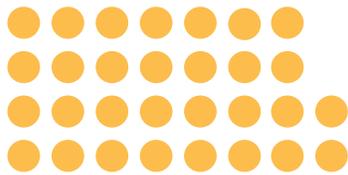
12%

*25% less use per person;  
new supply from projects  
and farms; max 30% grass  
in yards/parks*

Allosaurus

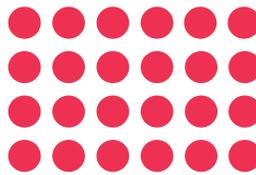
## WHY UTAHNS WANT IT (OR WHAT OUTCOMES UTAHNS EXPECT FROM WATER)

Survey participants were asked to allocate 100 points across these outcomes based on which they considered most important, under the assumption that we will supply sufficient water for urban growth.



30%

Ensuring there's plenty of water for farms and food production



24%

Ensuring there's plenty of water in our streams and lakes for wildlife



13%

Ensuring there's plenty of water in our streams and lakes for recreation



12%

Limiting how much we need to spend maintaining our yards



10%

Minimizing how much we need to spend on water infrastructure (pipes, reservoirs, etc.)



8%

Ensuring we have sufficient grass and other greenery in our yards, parks, and other landscaping

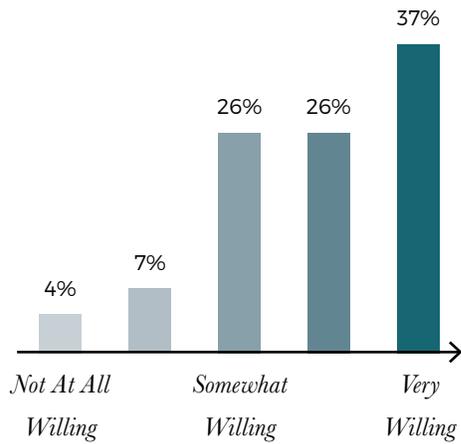


3%

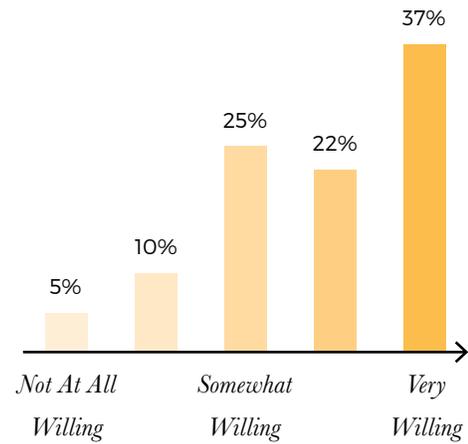
Ensuring we have large yards

## WHAT UTAHNS ARE WILLING TO DO TO CONSERVE WATER

*We will have to spend money on changing and maintaining our landscaping and irrigation systems (e.g., installing and maintaining drip irrigation systems).*



*In our yards, parks, and other landscaping, we will have less grass and other vegetation that uses a lot of water.*

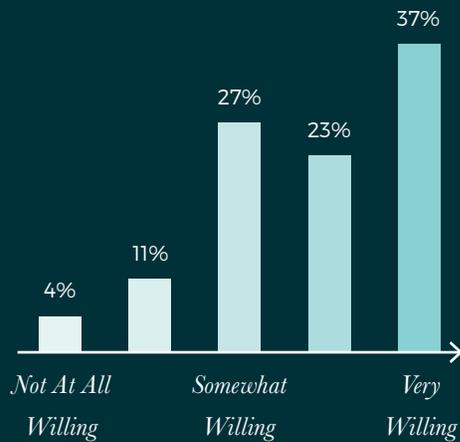


*Our homes will need to have smaller yards.*



## WHAT UTAHNS ARE WILLING TO DO TO EXPAND AGRICULTURE THAT IMPACTS WATER

*There will be less water to use for watering your lawn.*



*We will need to spend more money developing water infrastructure to move non-agricultural water to urban areas.*



REALIZING THE VISION:

# RECOMMENDED STRATEGIES

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## **1 Significantly reduce per-capita water use in Utah communities.**

- a) Reduce outdoor watering per household by meeting market demand for more houses on smaller lots, townhomes, condominiums, apartments, etc.
- b) Allow, encourage, and incentivize water-wise landscaping and irrigation practices.
  - Consider adopting rate structures that encourage conservation (e.g., tiered rate structures) without placing undue financial burdens on individuals and businesses.
  - Consider providing incentives and financial assistance to those implementing water-wise practices, such as making changes to landscaping, irrigation systems, or indoor fixtures and appliances.
  - Design open spaces and government-owned landscaping to be water-wise.
- c) Provide resources and education on water conservation to individuals and businesses.
- d) Maintain and improve water infrastructure to minimize system losses.
- e) Understand the basin-wide effects of local conservation activities (including the effects on the environment) and plan accordingly.

## **2 Ensure sufficient water for agriculture to increase our food self-sufficiency.**

- a) Sustain agriculture.
  - Improve the profitability of agriculture.

- Protect high-quality agricultural lands for food production through preservation tools that are consistent with private-property rights and Utahns' values.
  - Keep agricultural water in agriculture as much as feasible.
- b) Implement efficiencies in agriculture that reduce actual water depletion, and, where feasible, use the conserved water to put new lands into agricultural production.

**3 Adequately maintain, and replace where needed, existing water infrastructure; develop new water supplies as needed.**

- a) Develop a plan to fund infrastructure and new water supplies through a variety of sources.
- b) Implement programs that allow Utahns to reuse water, including greywater (reusable washwater), especially on large landscapes, while carefully considering the impacts on downstream flow.
- c) Increase aquifer storage and recovery where feasible.
- d) Consider increasing the capacity of existing reservoirs, mitigating impacts where feasible (e.g., by dedicating some portion of new storage to conservation pools and environmental flows).
- e) Improve watersheds so that they capture, hold, and release more water (e.g., by improving forest and rangeland management, using improved grazing techniques for livestock, increasing permeable surfaces in urban areas, and reintroducing beavers to watersheds).

- f) Continue to prepare for regional water development projects, while carefully evaluating timing and demand for those projects and continuing to emphasize conservation and analysis of alternatives.
  - Build regional projects only in conjunction with implementing conservation and local-supply programs and only when demand reaches appropriate benchmarks despite conservation.
  - Preserve and protect options for developing regional projects in the future (e.g., through planning, acquiring property for right of way, and conducting design, environmental, and engineering studies).
- g) Phase water and wastewater projects when feasible to reduce the cost to current users.
- h) Anticipate and preemptively meet water needs to avoid economic and social consequences of shortages.
- i) Protect Native American water rights by assisting tribes in putting water rights to use in Utah.

#### **4 Prepare for the potential impacts of climate change.**

- a) Diversify and increase water supply (e.g., through aquifer storage and recovery) to avoid over reliance on any one source of water.
- b) Improve watersheds so that they capture, hold, and release more water (e.g., through improving forest and rangeland management, using improved grazing techniques for livestock, increasing permeable surfaces in urban areas, and reintroducing beavers to watersheds).
- c) Improve drought resilience.

- d) Increase research on adaptive technologies (e.g., water reuse programs) and on the effects of climate change to existing practices and infrastructure.

## **5 Foster a thriving economy.**

- a) Provide assurance of a reasonable, long-term water supply.
- b) Maintain adequate supplies of relatively affordable water for large businesses; consider water needs when recruiting businesses.
- c) Ensure low-income families can maintain an affordable cost of living while still irrigating attractive water-wise yards (through water rate structures, assistance in changing landscaping and irrigation systems, or other means).
- d) Maintain laws and policies that promote a predictable, collaborative, and low-cost system for allocating water among competing uses.

## **6 Ensure water quality and quantity to adequately sustain and maintain the environment by improving watershed management and preserving natural systems.**

- a) Develop and implement watershed management plans for both surface and groundwater.
- b) Implement appropriate nutrient and salinity controls, while protecting Utah's agriculture.
- c) Increase opportunities to ensure appropriate flows in critical reaches of rivers.
- d) Adequately mitigate the environmental impacts of water projects.

**7 Improve the availability and quality of information about Utah's water.**

- a) Improve the quality of water data that is collected.
- b) Make water data, especially real-time data, more accessible to the public.
- c) Improve projections of climate changes' long-term impacts on local water.
- d) Improve understanding of the amount of water in and the function of water basins, including critical groundwater basins (e.g., by creating mass-balance models).

