September 10, 2018
Drought Review and Reporting Committee Meeting Summary

Vice-Chair - Division of Emergency Management

Six counties within the state of Utah have declared drought disasters: San Juan, Box Elder, Wayne, Grand, Emery, and Carbon counties. The Division of Emergency Management tries to coordinate resources as efficiently as possible and assist them in finding the help that they need. The Division can assist them with the Governor's Office and with the Department of Agriculture. The Division can also help coordinate with other federal resources, such as FEMA. The wildfires not only cause issues with the smoke in the air, but should there be a rainstorm after the fire, then debris flows result. Disasters have surfaced in local communities which have created dangerous situations for the residents.

A drought declaration on a county by county basis is more of an awareness than open up resources within the state or federal governments. The resources that the Division is providing is information mostly. As a note, the U.S. Department of Agriculture provides assistance for those that have drought declarations.

Water Supply Availability Committee

Brian McInerney, NWS

Robert Gillies, State Climatologist

Brent Rhees, Bureau of Reclamation

In the summer of 2016, the state of Utah was concerned about drought because of the dry periods from 2012 to 2016. However, the precipitation in December and January of 2016-2017 was 300% to 400% of normal. Such high precipitation filled the reservoirs, and eased many concerns over drought restrictions. The current year, 2018, there were record low snow packs and associated record low spring runoff. The summer of 2018 has also experienced the warmest summers on record. The reservoirs are all about half full, if not less in many cases. The recovery from these depletions is dependent on three cases: precipitation in the fall to fill the soil moisture, snow storage in the mountains, and a large spring runoff. Current weather reports show dry conditions all through September. Should the records show an average amount of precipitation, the local reservoirs will fill to a certain level but Lake Powell and Lake Mead will continue to drain. This scenario is going to get worse as the climate becomes more stagnant due to the high pressures in the west, the low pressures in the east, and temperatures continue to warm. The research alludes to an upcoming year of El Nino, which is promising, but there can be wet periods experienced amidst dry conditions. Predictions are also showing that the minimum temperatures are warming and greater intensity storms with less frequency are going to constitute the new normal.

The main storage reservoirs in the Colorado River Basin are Lake Powell and Flaming Gorge. Lake Powell was at 60% capacity at the end of 2017; this year the projection is to be 46% capacity. The drop

accumulates to 3 million acre-feet of storage. The model predicts 2019 storage at the end of the year to be 41% of average capacity. Flaming Gorge has done well, ending last year at 93%, this year it is projected to end at 90% full.

Utah has the densest reclamation projects in the West, and mostly located in the central to northern part of the state. The reservoirs they manage are: Hyrum, Newton, Rockport, Echo, Lost Creek, East Canyon, Causey, Pineview, Willard Bay, Jordanelle, Deer Creek, Upper Stillwater, Currant Creek, Soldier Creek, Starvation, Moon Lake, Red Fleet, Steinaker, Scofield, Huntington North, and Joe's Valley. On September 1, 2017 the average reservoir storage was 80% full. On a twenty year average, the Bureau expects the storage to be at 69% towards the end of the water year. As of September 1, 2018, the average reservoir storage is at 65% capacity, 4% below the expected average. Part of the reason the average storage recorded this year being so close to the twenty year average is in part due to the benefits of the 2017 wet year. Also, the reservoirs particularly in the northeast corner are designed for an eight year drought; this 2018 year is considered the second year of drought. The twenty year average and the annual recorded average do not include Flaming Gorge or Lake Powell. As a side note, the dam at Steinaker will be undergoing repairs shortly and will not be holding any storage.

At the Division of Water Resources, they continue to ramp up their messages on water conservation and water efficient practices for municipal water suppliers and users. The DWRe also encourages water supply diversity throughout the state. They are working with the Upper Colorado River Basin states, which are Colorado, Wyoming, Idaho, and New Mexico to formulate Drought Contingency Plans realizing that drought is going to continually occur.

There are 154 stream gages that are monitored across the state, twenty-four hours a day by the US Geological Survey. This year has experienced many instances where the staff at USGS has had to adjust equipment to adapt to the low flows in the streams. These adjustments, along with the change in channel shape/width has affected the accuracy of the gage readings. This has required additional work in determining the current channel area.

As less water becomes available, the lesser water rights are unfulfilled. As the summer progresses, increasing number of lesser water rights are unfulfilled, as per the norm. This year, users that typically have water throughout the summer, some water users are turned off sooner than anticipated.

Task Force 1 – Municipal Water & Sewer Systems

Scott Baird, Department of Environmental Quality

Water conservation is having an impact on the municipal water systems. Most of municipal systems have short term drought plans that are triggered by distinct events, but do not have long term drought plans in place. As a general statement, most of the municipalities do have enough water for the next few years depending on water conservation. There is not a long-term drought plan relating to climate change.

There is no real concern in regards to the sewer systems. The plants are capable of handling less water flowing into them. The primary impact in the long run is the reliance of cities on the dilution to deal with the wastewater effluent leaving the plants. This would impact the controls that are currently in place and how the water is treated before returning to the water bodies.

In regards to water quality, as drought situations occur, the decrease in water levels causes the nutrients to be concentrated, resulting in higher opportunities for harmful algal blooms. Several lakes and reservoirs have been closed due to these harmful algal blooms.

Task Force 2 – Agriculture

LuAnn Adams, Department of Food and Agriculture

92% of Utah is currently classified as experiencing some level of drought, with the southeastern quarter of the state in extreme drought conditions. As a result of this drought, livestock AUMs on federal land have been temporarily reduced in multiple parts of the state. There is an upswing of commuter permits trying to find forage, where ranchers are turning to Wyoming and Idaho. The wildfires have consumed all or part of the twenty-nine federal grazing allotments, which produce an estimated 29,497 AUMs annually. The loss of these AUMs will result in the loss of nearly $3 million annually in economic benefits for rural Utah until livestock resume grazing in recovered areas. The ranchers are having to sell their livestock at these auctions because they have lost not only their summer pastures but also their winter pastures. Cowboys are currently still looking for their cattle that have been scattered due to the wildfires. About fifteen ranchers have applied for emergency livestock watering assistance for roughly 10,000 head of livestock. Streams are drying up, wells are drying up; people are forced to haul water when they have never had to haul water before. Some ranchers are selling animals early to lessen the burden of having to provide feed, which in the case of emergency sales can result in livestock being sold at 60% of normal value.

Some places, for example in Blanding, there is no more irrigation water. Areas have seen reductions in alfalfa; typically these areas will get three yields of crop annually, and this year were only able to produce one sparse yield. As a result, hay this winter will be sold at a premium rate. Currently, due to the lack of green grass in the pastures, the ranchers are feeding their livestock hay. Due to these high stress conditions and lack of normal nutrition, mother cows and sheep are likely to abort their young, which will add again to the economic downturn.

A prevalent livestock disease currently is dust pneumonia. As the wind blows the soil into atypical areas, Pidgeon Fever is surfacing in increasing incidences. A significant number of producers have called for consultation concerning an increase in “pinkeye” in their cattle. This increase may be attributed to the bacterium Moraxella bovis, which could be a direct result from continuous smoke plumes from wildfires or an increase in face flies at water sources.

The Bureau of Land Management has the privilege of managing 23 million acres of land on behalf of the American people in the State of Utah. Their charge is to manage for multiple use and sustained yield; a task that proves difficult in the event of drought.

Task Force 3 – Commerce and Tourism

Linda Gillmor, Office of Rural Development

A concern that the Governor’s Office of Economic Development has is in the decline in tourism that decreases the number of locals hired for the tourism industry. Surprisingly though, the tourism has stayed fairly stable in area where there is provided alternative activities, such as summer activities at ski

resorts. Most of the effects of drought are seen in the smaller counties, particularly near reservoirs, that are experiencing the decrease in tourism.

When stories about wildfires hit the media, tourism decreases due to the fear of the tourists not having a place to stay. For example, the Brian Head fire. Although the fire was called “Brian Head”, the ski resort remained open along with neighboring cities, but the tourism significantly decreased because of the name of the wildfire. It comes highly recommended that those reporting the fire activities also report on when the fire is contained and extinguished, along with businesses that remain open. This change will greatly benefit the smaller communities that rely heavily on tourists.

Task Force 4 – Wildfire

Brian Cottam, Division of Forestry, Fire and State Lands

The Division does not staff fire-fighters, to fight the fires that are occurring, the Division cooperates with local governments and their firefighting entities.

Historical records have shown that the year following an unusually wet season is plagued with an increase in wildfires. Typically within the State of Utah, the average number of fires annually is 1,100; this year the total count is at 1,242 as of September 9, 2018 with still months till the end of the year. On average, the state of Utah burns 125,000 acres annually. Currently, the acres burned is at 221,000, which is approaching double of what is normally anticipated each year. Nearly 370 structures have burned and at least 86 homes this year alone. Particularly in the Dollar Ridge fire, the trailers that burned were the permanent residences of some of the local population but were counted as structures instead of homes. Therefore, there is likely far more than 86 homes that have been burned.

Looking at the damage the fires have done in terms of dollars: what is typically considered suppression costs, the State spends $50 million, and currently they have spent $80 million this year. In terms of number of fires, the state is not experiencing an unusual count; however, the costs, size, etc. numbers are outrageously high compared to normal. For example, a typical year experiences two or three fires that cost the State at least a million dollars. This year the count is currently at 12 (not including Labor Day weekend fires).

The drought is driving these numbers. The key to containing these fires is all in the initial attack on the onset of a fire. Because of the extreme dry conditions, the starting point of these fires are in difficult to reach locations and cripple the initial attack. A general public misconception in regards to wildfires is the perceived lack of danger following a rain event. Because of the extreme dry conditions, the risk of starting a fire are just as likely after the rain event as was before.

Task Force 5 – Wildlife

Mike Fowlks, Division of Wildlife Resouces

The biggest concern that the Division of Wildlife is habitat degradation due the drought and having more wildlife on the landscape than the land can support. To help mitigate this, the Board of Wildlife has issued more big game permits to the areas most affected by drought. Already they have observed fawn

mortality rates increase within the big game population. For example, within the San Juan County the study they were conducting on the local fawn, 100% mortality of those collared, which leads to conclusive results that there is 100% mortality of all fawn in San Juan County.

Over 300,000 acres were affected by wildfire. The state of Utah has the Watershed Restoration Initiative that helps fund the rehabilitation efforts in the areas affected by fire. Because this is the biggest fire season since 2012, the cost to restore the land is going to be astronomical. So far, the cost to re-seed what has burned will cost $5.3 million; the estimated total does not include the fires the occurred over Labor Day weekend. This high cost funnels money away from other state projects they had scheduled to do to pay for this rehabilitation.

The flooding events experienced in Duchesne County completely destroyed the fisheries from a mile below Strawberry Reservoir to Starvation Reservoir; there is no aquatic habitat left, including the Blue Ribbon fishery. The endangered fish species have been gathered up and placed in a fish hatchery for protection.

The negative impacts experienced in agriculture mirror that of the wildlife, and as a result, the Division of Wildlife works closely with UDAF. They have been collaborating on grazing solutions and increasing big game permit numbers. When there is a drought, the wildlife turn to the crops for the livestock for sources of nutrients and cause damage. DWR is trying to mitigate that damage with the Department of Ag. The annual budget for covering wildlife damages to agriculture is $700,000 and the Division is anticipating on spending all of it this year.

Task Force 6 – Economic Impacts

Richie Wilcox, Governor's Office of Management and Budget

The main responsibility is to aggregate all the economic losses in regards to the drought. Since the reports were not submitted to the Governor's Office of Management and Budget prior to the meeting today, there is little to report on.

The meeting adjourned without the conclusion of declaring Utah to be in a state of emergency.

Attachment 1: Task Force 1 Municipal Water & Sewer Systems

As reported by L. Scott Baird JD, MPA

Deputy Director at the Utah Department of Environmental Quality

Any existing and potential drought related problems

Drinking Water: We don't now know how extensive the problem is that some water systems just frankly have no idea what the demand on their system is and why and when. Nor do they all know how much of their current source water portfolio they are utilizing. The new water use data program recently required by the legislature will make water systems understand the fringes of their demand curves much better. It is intended to encourage conservation and will facilitate identification of excessive water losses that can be targeted and fixed. Tied to this program is our new system-specific sizing standards to help right-size water systems so they don't run dry but also don't over compensate.

Water Quality: The primary impact of drought on water quality is in reduced stream flows and low lake levels. Reduction of water in our streams and lakes results in an overall increase in concentrations of pollutants. In addition, drought can affect water temperature and by extension dissolved oxygen concentrations thus affecting the health of aquatic life. Long periods of warm temperatures without significant weather events also increases the probability of the formation of harmful algal blooms in nutrient rich waters.

The capability of municipal water systems and sewer systems to withstand drought impacts

Drinking Water: We encourage and track water systems that have an emergency response plan in place. While this is typically for distinct events, the plan lays out contingency plans and redundancies that are useful in a drought situation. Many of our water systems are either woefully unprepared for their one or two water sources to run dry or are planning on relying heavily on one of the state's large wholesale water providers. This works well to offset a few years of drought but would not be a solution for long term climate change. In addition to this water systems that have undergone master planning are much better suited to address drought issues because they have at least thought about future capacity needs and considered ways to meet it.

Water Quality: The state's wastewater systems are capable of handling varying flows and thus are not expected to be widely affected by drought directly. Indirectly, extended periods of drought or more long-term changes in our climate system that result in reduced water flows and warmer temperatures could require additional treatment for wastewater treatment plants to comply with in-stream water quality standards that depend on dilution. Further, long-term drought could drive additional reuse projects in the wastewater sector that could further deplete instream flows and lake levels.

Municipal fire fighting capabilities related to low system pressures or supplies.

Drinking Water: We identify the need to provide capacity, both quantity by having enough storage and pressure by having the correct pipe size, in our rules. This will also continue to be mentioned in the new rules from last year's legislation. However, we rely on the fire authority to know what is needed. We then merely check against that number to make sure they have enough.

Attachment 2: Task Force 2 Agriculture

As reported by LuAnn Adams

Commissioner of Department of Agriculture and Good

Utah Department of Agriculture & Food
Effects of Drought, 2018 Summary Report

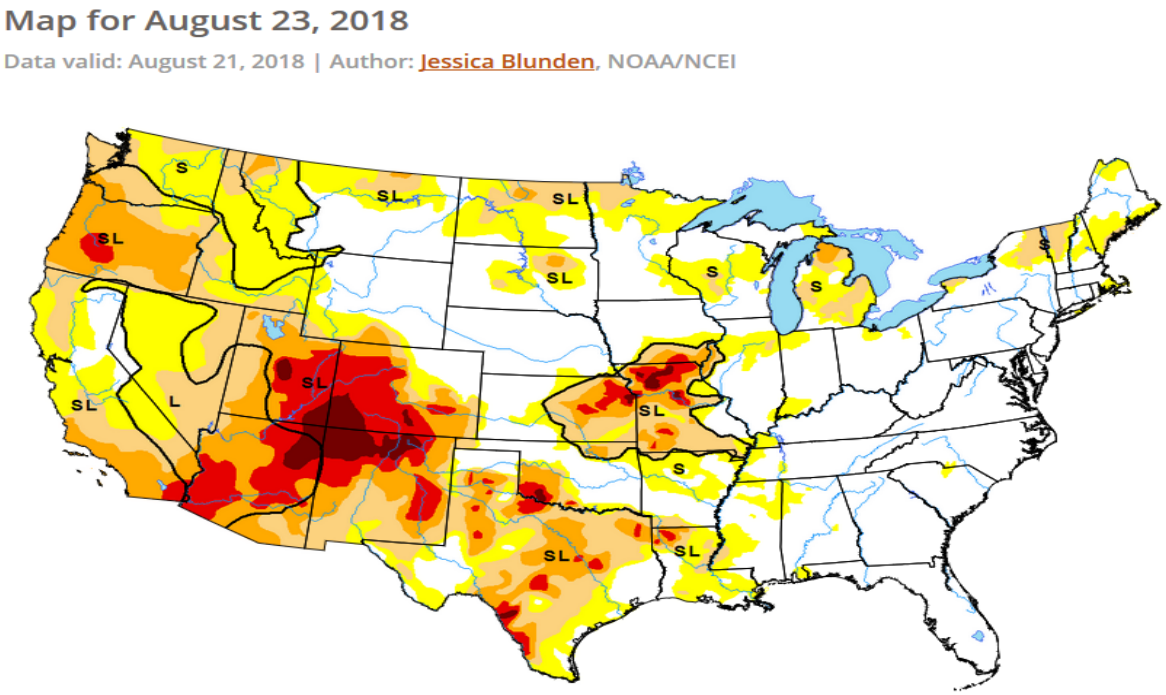
Known drought related impacts:

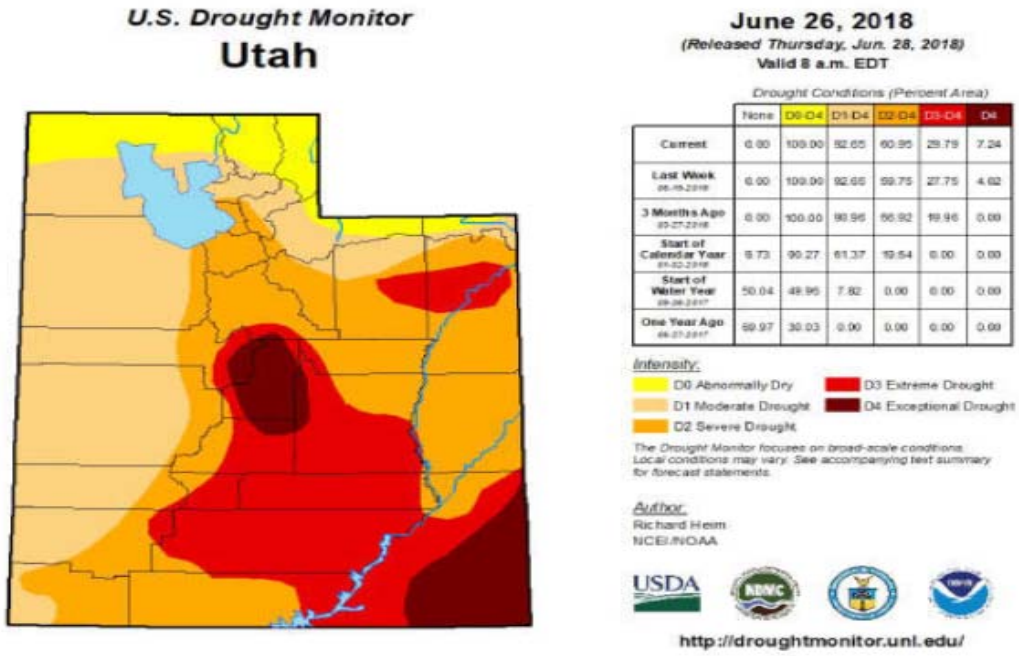
1. 92% of Utah is currently classified as experiencing some level of drought, with the southeastern quarter of the state in extreme drought conditions.
2. Livestock AUMs on federal land have been temporarily reduced in multiple parts of the state due to drought conditions.
3. First year commuter permits have increased, signaling permittees' need to seek livestock forage outside the state, mainly in Idaho and Wyoming.
4. Wildfires have consumed part or all of 29 federal grazing allotments, which produce an estimated 29,497 AUMs annually. The loss of these AUMs will result in the loss of nearly $3 million annually in economic benefits for rural Utah until livestock resume grazing in recovered areas.
5. Around fifteen ranchers have already applied for emergency livestock watering assistance for roughly 10,000 head of livestock.
6. Some producers have called for consultation concerning an increase in "pinkeye" in their cattle. This increase may be attributed to the bacterium Moraxella bovis, continuous smoke plumes from wildfires, or an increase in face flies at water sources.
7. Some ranchers are selling off animals early to lessen the burden of having to provide feed, which in the case of emergency sales can result in livestock being sold at 60% of normal value.

Future impacts under prolonged drought:

- *Wildfire* – Wildfires occur more frequently, burn hotter, and burn more acres in drought years. This leads to a loss of rangeland for sheep and cattle and destroys watering structures and fences on the range. It also increases erosion since the plants' roots are unable to stabilize the soil, further degrading the range and its suitability for grazing.
- *Stockwatering and irrigation water shortages* – Reduced snowmelt in drought years diminishes streamflows, reduces aquifer recharge, lowers water tables, and results in increased pumping which depletes aquifers and can dry up wells. This can result in a loss of watering holes or streams which water livestock and in a reduction or complete loss of water used to irrigate crops. In addition, the loss of a perennial such as alfalfa to drought may result in extra expenses to replant the crop.
- *Livestock Diseases* - The increase in dry and dusty conditions may increase incidences of soil borne bacteria such as Corynabacterium paratuberculosis as the winds blow the soil into atypical areas, which can cause Pigeon Fever in horses. Also, this disease may be spread from concentrating biting insects at water sources.
- *Insects* – We anticipate seeing a greater concentration and wider distribution of insects in pastures, other forage, and crops. Droughts tend to create ideal conditions for insect reproduction, increasing numbers. With the drought reducing the availability of forage on the range, these larger populations move into crops and irrigated pastures.

- *Increasing heat index* - Lack of irrigated crops means fewer cooler and wetter microclimates and less canopy over bare soil, which increases the solar exposure and heat retention of the soil. This exacerbates the effects of the drought, especially with wildfires and monsoons.
- *Erosion* - The increasing heat index creates stronger monsoons which erode soil which is parched by drought or has been burned, reducing its ability to resist erosion.
- *Economic impacts* – The crop losses and expenses incurred in hauling in water, pumping water instead of diverting surface water, or drilling new wells due to stockwatering and irrigation water shortages can be extreme. Farmers have fixed costs (fertilizer, fuel, etc.) but less crop revenue in drought years to help cover these costs.





Following a dry winter and spring, two parts of Utah are enduring "exceptional drought" conditions.

CREDIT U.S. DROUGHT MONITOR

Attachment 3: Task Force 3 Commerce & Tourism

As reported by Linda Clark Gillmor

Director, Office of Rural Development

The following email sent on September 4, 2018 to representatives of the Utah Ski Association, Division of Parks & Recreation, Department of employment Security, National Park Service, Bureau of Land Management, U.S. Forest Service. (Note: GOED either didn't have contact information for all of the entities listed above, or they didn't respond, so a request was emailed to the Office of Tourism to get more complete data). County Commissioner responses are listed after Tourism and Ski Industry responses. They received a slightly different email request.

*Dear ******

As you are probably aware, Utah's drought conditions have reached a level of severity that impacts tourism and commerce across the state!

I am representing the Governor's Office of Economic Development (GOED) on a "Drought Review and Reporting Committee" (which by state statute is triggered by such a severe drought)

To truly measure the impact of the current drought conditions, I am asking that each of you reply to this email by answering the following 2 questions:

- What is the industry that you represent?

- What existing and potential drought related problems is your industry experiencing, such as:

- *loss of sales tax revenues?,*
- *increases in unemployment?, or*
- *decreases in tourism visitation levels and lodging receipts?*
- *other?*

GOED has been requested to gather this information prior to a Drought Review and Reporting Committee (DRRC) meeting on September 10.

Please don't worry about extensive details at this point unless they are readily available.

In order to have your concerns brought to this group for consideration in determining the most immediate needs for the state's response to this drought, please have your responses back to me by this Thursday, September 6th.

Thank you for taking a few minutes to represent your county!

Sincerely,
Linda Clark Gillmor
Director, Office of Rural Development

Tourism:

Respondent: David Williams (Utah Office of Tourism)

According to research conducted by RRC Associates regarding the 2017-18 ski season:

- Snowfall was down 26% in the Rocky Mountain region
- Utah skier visits were down 9.6% from a record season in 2016-17, going from 4.58 million the prior season to 4.145 million visits in 2017-18. However, the 4.145 million visits were nearly identical to the 10-year average of 4.141 million.
- Utah ski/snowboard-related spending fell 7.6% from an estimated $1.431 billion in 2016-17 to $1.322 billion in 2017-18, but $1.322 billion was still the 2nd highest spending in the last five years of RRC doing the research.
- Along with less snowfall, Utah experienced higher than average temperatures. [Most Utah resorts have snow-making ability, but they are still dependent on cold temperatures to make snow]. The trend of warming temperatures is a concern.

Traditionally, better snow years lead to higher numbers of skiers and more ski-related spending. Utah's resorts did well in 2017-18 despite challenging circumstances, but the industry is definitely hoping for more snowfall this winter. A prolonged drought could lead to less visitors and less spending. Now that there are ski passes available that include resorts in several states and countries, it is easy for skiers to purchase one of these passes and then simply travel to one of the resorts on the pass where conditions are most favorable.

Other negative effects of the drought:

- Drought conditions could lead to an increase in the number and/or size of wild fires throughout the west. The Brian Head fire in 2017 received a lot of publicity, and visitors stayed away even though Brian Head resort and the town of Panguitch were still open for business. Wild fire coverage in the media often results in less visitors.
- Visitors already comment about inversions and air pollution in Utah in the winter. Smokey haze during the summer from wild fires throughout the West can only reinforce the perception of Utah having an air pollution issue. This could lead to less meeting and convention planners choosing Utah for their events.
- Many of Utah's state parks are reservoirs. Visitation is down at several of them. We aren't sure if this is due to the drought or other factors. We assume there will be a member of the committee from Utah State Parks who would have more insight.

Ski Industry:

Respondent: Nathan Rafferty (President & CEO Ski Utah)

All of the above (referring to list in email request, see below)

- loss of sales tax revenues?,
- increases in unemployment?, or
- decreases in tourism visitation levels and lodging receipts?
- other?

No water = no snow = no good.

The following email was sent out to Rural Commissioners & Council Members on September 4, 2018:

Dear Rural Commissioners and Council Members:

As you are probably aware, Utah's drought conditions have reached a level of severity that impacts tourism and commerce across the state! We expect that this drought has also impacted each of your counties.

I am representing the Governor's Office of Economic Development (GOED) on a "Drought Review and Reporting Committee" (which by state statute is triggered by such a severe drought)

To truly measure the impact of the current drought conditions, I am asking that at least one representative from your commission reply to this email, answering the following question:

What existing or potential drought related problems is your county experiencing, such as:

- ***loss of sales tax revenues?,***
- ***increases in unemployment?, or***
- ***decreases in tourism visitation levels and lodging receipts?***
- ***impact on other industries within your county, such as grazing or farming?***
- ***other?***

GOED has been requested to gather this information prior to a Drought Review and Reporting Committee (DRRC) meeting on September 10.

Please don't worry about extensive details at this point unless they are readily available.

In order to have your concerns brought to this group for consideration in determining the most immediate needs for the state's response to this drought, ***please have your responses back to me by this Thursday, September 6th.***

Thank you for taking a few minutes to represent your county!

Sincerely,
Linda Clark Gillmor
Director, Office of Rural Development

Respondent: Stan Summers, Box Elder County Commissioner

We have put a drought resolution in effect because of all that you've mentioned
But you did not say anything about fires….We've had 80 plus fires, And have burned over 100,000
Acres.

Respondent: Gregory Todd and Ron Winterton, Duchesne County Commissioners & Irene Hansen, Duchesne Economic Development Director

What existing or potential drought related problems is your county experiencing, such as:

- **loss of sales tax revenues?,** Agriculture including both full and part time ranching is a mainstay of the Basin and certainly Duchesne County. Duchesne County oftentimes ranks in the top 4 producers statewide in multiple areas. And immediate effect is felt whenever the producers are being financially impacted. The coffee shop to the care dealers and everything in between is adversely affected during a drought!!! It is hard to put your finger on a feeling or a cloud of uncertainty that simply hands over our thirsty state. People seem apt to take less risk in business decisions during a drought. Our energy industry who is already conserves water in every possible way, are very concerned. We believe this is affecting some of their decisions for investment.

- **increases in unemployment?,** Our unemployment has been dropping because of an uptick in the Energy Industry. However upon closer reflection companies who rely on 75% or more of their revenue on Ag Producers have not increased the number of employees they currently have. Several managers have not replaced those who have quit or retired.

- **decreases in tourism visitation levels and lodging receipts?** This weekend September 8, is one of our largest events in Duchesne County. The Fun Family Day at Starvation. The low water is making several of the events difficult or impossible to do. The organizer of the fishing tournament is expecting a 20% decrease in angler participation because of the shockingly low water levels. The results will mean a reduction in rooms rented and gas and meals purchased in Duchesne City. Our travel and tourism personnel have reported many phone calls from

people this spring and summer who have considered changing plans for family reunions and vacations because of the drought conditions**.**

- **impact on other industries within your county, such as grazing or farming?** Grazing allotments are always being analyzed and are at risk!! When drought conditions are factored in land managers are much more likely to err on the side of maintaining healthy condition of grasslands. Drought causes a radical reduction of grazing availability. Some ranchers have had to sell livestock early because grazing was not viable and alfalfa and hay becomes scarce. As water turns have been reduced alfalfa farmers may only get 2 crops instead of 3 substantially reducing the winter stockpile. Corn fields are so dry their stock growth is visibly shorter than on a normal water year.

- **other?** Droughts cause a dry brittle and extremely fragile landscape that is highly susceptible to simple mistakes people can and will make. Even a muffler on an OHV can easily cause dry grass to catch on fire. Residents become extremely frustrated as their normal routine is constantly questioned because of dry conditions. 2018 wildfires have cost the state and county millions. We do feel extremely fortunate their there was no loss of life in the Dollar Ridge Fire.

Respondent: Natalie Randall, San Juan Economic Development Director on behalf of the Commission

Per the email correspondence with commission I've included a response below as relates to tourism and economic development.

I'll reach out to industry partners. However, I can say visitation is down. We don't have set numbers, and the TRT hasn't seen a dip at this point (although increased room rates could contribute to this, additionally it does take time to see change in this collection). Although county, region, and state wide we've heard reports of a decrease in visitors. Some factors (related to drought) we believe contribute include: fire ban and air quality. The effects have been seen by visitor centers, lodging properties, restaurants, guides, and etc.

Specifically I've heard in the tourism industry that Yellowstone's fire bans have had a significant impact on international visitation. Typically an international visitor is on a loop/through trip where they are visiting iconic areas and including San Juan as part of the itinerary. Many travelers once they saw that Yellowstone had closures/restrictions didn't look any further and simply cancelled their entire trip.

Another industry I haven't heard of any affects, but I'll look into, might be uranium and copper. Both processes use significant amounts of water, although it is welled. They might also have seen impacts.

Respondent: Ray Peterson on behalf of the Emery County Commission

Most of the effect of the drought is being felt by the agriculture industry. Although water for irrigation has held up surprisingly well, grazing on federal land is greatly reduced. Manti LaSal permitted will be coming off the summer pastures 2-3 weeks early. Near zero precipitation on BLM allotments will result in greatly reduced winter grazing.

Compounding the problem, inefficient precipitation monitoring (see email chain below) is resulting in inequitable drought relief.

I'm unable at this time to provide information that says tourism/visitation is down as a result of drought.

Note: A series of emails detailing an issue caused by incomplete precipitation data which has interfered with USDA Upper Colorado River Basin Drought payments.

> The following is a link to the Upper Colorado River Basin Drought team data site.
>
> http://climate.colostate.edu/~drought/index.php
>
> The effect of the precipitation data anomalies is felt by producers that participate in USDA programs - both RMA and FSA.
>
> When rainfall and precipitation is used to determine the level of benefit received by producers suffering in drought conditions, the difference in retribution is easily hundreds of thousands of dollars, if not millions. Accurate weather stations need to be utilized to correctly implement programs administered by the USDA. The Drought Monitor is used to trigger eligibility for the Livestock Forage Program and the Emergency Livestock Assistant Program (FSA Programs) and the Rainfall Index is used to trigger eligibility for the Pasture, Rangeland and Forage Insurance program (RMA). Both the Drought Monitor and the Rainfall index rely on weather stations like the Agrimet Weather Stations in the towns, the NRCS SnoTel sites in the mountains , NOAA Coop Weather Stations. It would appear from the website above that there are few reliable weather stations in the desert areas of Emery County or that if they exist they are currently not working or not reporting to the correct sources.
>
> **Mistie J. Christiansen**
>
> County Executive Director
>
> Emery Carbon Farm Service Agency
>
> Phone – 435.381.2300 ext 2
>
> Cell – 435.749.1593

Attachment 4: Task Force 4 Wildfire

As reported by Brian Cottam

High Priority Threats

Utah's 2018 wildfire season, by almost any measure, has been far beyond normal. A few statistics to provide context for the year:

- To date, on all jurisdictions statewide, Utah has had more than 1,200 fires burning nearly 195,000 acres. Our official fire season here in Utah will continue through October, so these numbers will only increase.
- A "normal" fire season (10-year average) will see roughly 1,100 total fires burning approximately 125,000 acres (again, all jurisdictions statewide). So we area already well above "normal" for both total fires and total acres burned.
- Nearly 400 structures have burned this year, including at least 90 permanent residences/homes. These are far beyond the norm for Utah where any loss of homes is considered catastrophic and we average only a few dozen total structures lost in an entire year.
- The fire suppression costs in a typical year (suppression only) average around $50 Million for all fires, all agencies. The 10-year average of *State and local costs* is approximately $10-$11 Million per year. This year already we have roughly $75 Million in total costs with the State's share of the suppression costs being more than $25 Million.

By any measure, 2018 has been a long, difficult fire season with conditions on the ground and resulting fire behavior certainly influenced by prolonged drought.

On the positive side for wildfire, now with shorter days, less direct sunlight to heat & dry fuels, cooler nights, increased precipitation and relative humidity levels, the threat of fire has been reduced in many parts of the state. However, fuel conditions are still extremely dry and conditions exist that can lead to catastrophic fire. Until there is prolonged moisture or snow, the threat of fire is still very high in much of the state.

In the latter parts of this fire season, high priority threats continue to be:

- the wildland/urban interface, or anywhere homes and other human infrastructure intermingle with wildlands. WUI areas are always a high concern for fire managers as the impacts, risks and costs are always higher in these areas of human habitation and development;
- the range-lands and grass-lands of western and northern Utah. These fine fuels can dry to extreme levels in just a few hours of direct sunlight and higher temperatures. Even with moisture and the changing season, the lower elevation range- and grass-lands will continue to be highly susceptible to fire;
- and the returning annual cycle of post-monsoon wildfires in southern Utah, particularly SW Utah. As temperatures increase, SW Utah generally sees wildfire earlier in the year than other parts of the state and it tends to cycle back later in the fall as temps remain relatively higher and summer rains diminish leaving plenty of drying fuels from the summer grasses.

Fire Protection Capabilities/Resources and External Sources of Assistance

Inter-agency wildfire management in Utah is well organized and highly effective. Positive working relationships are an inter-agency priority and consistently strong at both the leadership and field levels. This cooperative and supportive environment lends to more effective suppression response across the state.

As fall arrives, school starts and the "normal" fire season begins to wane, state and federal seasonal firefighters are being let go as is the norm this time of year. For example, at the Division's Lone Peak Conservation Center (LPCC), which houses the State's seasonal firefighting resources, including our two Hotshot crews, two IA crews, and two Engines, all are now in the process of being demobilized for the year. LPCC will maintain a single, ad-hoc, roughly 20-person crew with those firefighters that want to remain on staff for late-season fire response and project work within the State. This crew will be let go late in the fall as weather dictates accessibility to project work.

Beyond the LPCC crews, the Division of Forestry, Fire and State Lands still has more than 100 red-carded personnel from the permanent, full-time staff in the six Area offices and State Office. Area office staff particularly, including the County Fire Warden in all 29 counties, are available and expected to respond to fire at all times of the year, so local FFSL fire leadership and response is in place year-round and capable of meeting demands in the shoulder and off-seasons. Moreover, the Utah Fire and Rescue Academy has also certified and red-carded nearly 2,200 fire department personnel from across the state for wildland fire response. Local FDs and their firefighters are the foundation of the State's Cooperative Fire Management System and local FDs have the statutory responsibility for initial attack on all wildland fires in their jurisdiction. Local FDs also have a strong system of mutual aid, so nearby FDs support one another and respond to calls as if they were their own. These wildfire qualified, well-trained and properly equipped resources are in place year-round and ready to respond.

Finally, though the federal agencies are also in the process of losing their respective seasonal firefighters, as is the case with FFSL's permanent staff, the federal agencies' year-round personnel also have fire qualifications and responsibilities and will respond as necessary. Taken together--FFSL staff, federal agency personnel, and the hundreds of red-carded local firefighters--these resources are sufficient to provide effective initial attack statewide.

Regarding external sources of assistance, only a large or extended attack wildfire would require additional resources beyond what is already in the state within the various agencies and FDs. As we do during the height of fire season, any incident that is beyond local capacity will rely on the national response system and resources will be allocated accordingly. We have seen in recent years that as seasonal fire personnel are let go and California's fire season particularly continues to increase in length and severity later into the calendar year that national resources can be stretched thin with the necessary response to CA fires. As well, as the U.S. South begins to dry in the fall, we're beginning to see

larger, more catastrophic wildfires in southern states later in the calendar year. These geographic trends combined can and have put a strain on the remaining national resources, which could limit any external response here in Utah. This is handled just as it is during the middle of a busy fire season and is not abnormal or unique to Utah. Our inter-agency fire leadership and personnel are accustomed to working within this system and will effectively use the resources that are available any time of the year.

The inter-agency fire management system in Utah is well equipped and prepared to meet the wildfire response needs across the state even as the drought continues and seasonal resources are released.

Attachment 5: Task Force 5 Wildlife

As reported by Mike Fowlks

Director of the Division of Wildlife Resources

Impacts of drought and wildfire to Wildlife and Fishery Resources – Statewide Update August 2018

Range Conditions with Drought

Generally speaking, the southern and eastern portions of the state have been hit harder by the drought, but the entire state is experiencing some drought related problems. Highlights from DWR's regions going from North to South are included here.

Northern

Northern Utah received adequate winter precipitation and had some good spring rains. It has been a hot dry summer with very little precipitation coming in June – Aug. A poll of all the biologists in the region indicated that general habitat conditions are dry but major changes or impacts to habitat have not been observed. Through the summer, there have been dry conditions. There were noted areas where springs have reduced flows and water catchment ponds have dried up. This has caused wildlife to be distributed differently and have moved to areas with water including elk moving to agricultural areas earlier than normal.

Northeast

Drought conditions were widespread throughout the Northeastern corner of Utah in 2018. Much like the last half of 2017, 2018 started off with minimal precipitation with only one moderate rainfall event occurring in April in the NER. These dry conditions, coupled with minimal snowpack, left rangelands lacking of water throughout the spring green-up period. This resulted in a significant reduction of annual growth from our perennial grass species. Many forb species either did not grow, or were severely diminished. There was no significant rainfall throughout the main growing season with some localized monsoonal moisture developing in the region starting around July 20th, 2018. The Book Cliffs, in particular, has very limited annual forage production this year. Other areas, such as Diamond Mountain, while dry, had adequate forage production. Elevations between 5,000-7,000 feet were most impacted by this drought. To help address potential forage shortfalls during the winter of 2018/2019, the NER has proposed to increase antlerless elk harvest by up to 20% on some units within the region. Elk winter range areas have probably experienced the largest impacts to forage production from this drought, and these measures will help minimize depredation issues and help many wildlife species get through the upcoming winter.

Central

Overall range conditions in the Central Region are good. Spring rain in the west desert was above normal and herbaceous production was very good this year. Farther east, along the Wasatch front has been a drier spring with less than normal monsoon moisture. Herbaceous production was still fairly normal but vegetation dried out by late June and continued to be very dry all summer. Farther south in Sanpete county conditions were much drier and herbaceous production less than average. After spring grazing there was little or no regrowth on WMAs. Wildlife water in the county is also limited this year with several springs and water sources reported dry in some areas. Without the usual monsoon moisture to recharge guzzlers from heavy wildlife use, some of the Regions guzzlers on Lake Mountain and Timpie Valley (north end of Stansbury Mtns) are now empty.

Southeast

Range conditions in Southeastern Utah are mixed but are overall pretty poor. Extreme drought has been experienced across a majority of the region. In Grand and San Juan counties, conditions were so poor that the cheatgrass didn't germinate along with other annual grasses and forbs. The warm season grasses only came out of dormancy in areas where there were isolated rain showers. There are visible signs of drought stress in the mountain browse community and there has been very little leader growth. In the sagebrush community, there are plants where leaves are drying up and falling off. There is low vegetative production in general on winter range. There are concerns that a heavy snow year will result in extra energy expenditure that could be fatal to them due to current poor body condition. Pronghorn have probably fared the worst. There is very low fawn production as a result of drought (11 fawns per 100 does on the Nine Mile Unit). There does not appear to be any major population level impacts so far for mule deer except in the San Juan unit. Near total loss of the fawn crop this year due to drought could hurt that population for years to come. Winter ranges near Price look much like they did in 2002-2003, where we saw local sagebrush die-offs and it took several years to recover. We expect the same after this current drought cycle. Drought has caused poor range conditions on the Henry's and hence the subsequent increase in bison tags this year to try to remedy that so permanent range damage isn't realized. The drought has also caused stress in aquatic species. In the Green, Colorado, and San Juan Rivers extremely low water flows have resulted in high water temperatures and stressed fish. Our native aquatics fish crew out of Moab has not been able to handle fish when sampling due to high stress levels, however, they have been finding several young of year fish.

Southern

Overall range conditions in the Southern Region vary between poor to good. Spring rain across the region was non-existent as well as very little snowpack resulting in the range being very dry with very little production at the onset of summer. Additionally there were multiple observations of traditional water sources being unavailable as they were no longer producing. As a result of these conditions the region instituted a formal drought monitoring protocol that involved an intense look at conditions on what we believed to be the worst areas in the SW Desert Unit. The drought route was monitored on average 2X a month throughout the summer and looked at range conditions and water availability. Initially, water availability was extremely limited and range conditions were better than expected due in large part to the success of multiple habitat projects in Hamlin Valley producing well. As monsoon season came the SW Desert received significant moisture and resultantly additional green up and growth was noted. Also of note ponds filled and many water sources became available. Incidentally, while we monitored the SW Desert believing it was looking at our regions worst case scenario the reality has been that the further east in the region you go we have seen significantly less monsoonal moisture resulting in some areas still being in poor condition. Specifically the Boulder unit has been identified as still very dry and very little production. Generally the range of good to fair to poor follows this pattern with our western most units being in the best conditions and easternmost in the worst.

Wildlife Board approved an additional 723 antlerless elk, 35 doe pronghorn, and 109 bison permits this year because of the drought.

Wildfire and Impacts to Wildlife and Fisheries

We are nearing 300,000 acres impacted by wildfires this summer. Many of the fires have been in mid to high elevation areas so we are optimistic we'll see some good recovery of mountain brush and aspen communities in the near future. A few fires have been more devastating to both rangelands and stream systems. The Dollar Ridge fire is perhaps the worst fire as far as impacts to wildlife are concerned. Here is a summary of major impacts to streams and fisheries from 2018 wildfires so far.

Coal Hollow Fire 2018 (30,000 acres) - Dairy Fork Creek and Lake Fork Creek watersheds (Spanish Fork Canyon)- Losses are unknown at this time but significant or complete fish kills are expected. Mudslides and/or sediment and ash flows are ongoing. A fish kill was documented within the Spanish Fork River but the extent is unknown at this time.

Dollar Ridge 2018 (70,000 acres) - Strawberry River drainage, mostly below Strawberry Reservoir- Flash floods, ash flows and pH changes are continuing in the mainstem Strawberry above Timber Canyon. Complete loss of the fishery. Starvation Reservoir-Ash and sediment flows will most likely cause nutrient issues and associated toxic algal blooms in Starvation Reservoir in future years.

Impacts from Brian Head Fire of 2017- Paragonah (Red Creek) Reservoir - Lost 80% of fish in lake due to debris and ash flows following fire. In 2018, lost additional fish (unknown numbers at this time). The reservoir contained a self-sustaining population of RBT prior to fires. Significant habitat damage to Red Creek (inflow) will impact reproduction for numerous years. Hendrickson Lake - Complete loss. Small <5 acres back county lake. Forbay Pond - Complete Loss. Small <5 acres heavily used "urban" fishery. Pond was drained due to flooding and damaged outlet structure by flash flood. Panguitch Lake - Increased nutrient loading and toxic algal blooms (August, 2018). Parowan Creek (Observation) - Complete loss of fishery and some habitat damage, 14 miles. Little Creek (Surveyed) - Complete loss of fishery and severe habitat loss, 9 miles. Red Creek (Surveyed) -Tributary to Paragonah Reservoir (Important for spawning and rearing) Complete loss of fishery and severe habitat loss, 6 miles. 3-mile/Delong Creeks (Surveyed) - Complete loss of fishery and severe habitat loss, 11 miles. Flooding in 2017 and 2018. Clear, Ipson, Bunker creeks (Surveyed/Observation) - Tributaries to Panguitch Lake (Important for spawning and rearing) Complete loss of fishery and some habitat damage - 24 miles. Castle Creek, Indian Hollow, and sections of Mammoth Creek- Some fish loss and minor habitat damage – 45 miles. Flooding in 2017 and 2018.

West Valley Fire (Pine Valley Mountain) 2018- Pine Valley Reservoir - Ash flows entered lake in 2018 – We have had reported fish kills, high ph, and algal blooms. Unknown extent of fish loss at this time. New Castle Reservoir - Ash flows entered lake in 2018 – We have had reported fish kills, high ph, and algal blooms. Unknown extent of fish loss at this time. Pinto Creek – Ash Flows 2018 – Tributary to Newcastle Reservoir- Reported fish kills unknown extent at this time, minor habitat damage. Reservoir Canyon - Ash and debris flows 2018. Complete loss of fishery, and significant habitat damage. Water Canyon - Ash and debris flows 2018. Complete loss of fishery, and significant habitat damage. South Ash Creek - Ash and debris flows 2018. Condition of fishery unknown at this time expect some loss. Salvaged fish prior to flooding currently held at Loa Fish Hatchery. Left Fork Santa Clara River - Tributary to Pine Valley Reservoir, ash and debris flows 2018. Complete loss fishery, some habitat damage.

Trail Mountain Fire 2018 (18,000 acres) - Crandall Creek, Rilda Creek- Extensive and complete fish kills occurred from flash flooding and debris flows in 2018 and will likely continue for several more years. Additionally fire retardant was dropped on the only known breeding population of boreal toad in south eastern Utah. The extent of the damage has yet to be determined.

Drought Related Damages to Aquatic Related Wildlife

Diamond Mountain lakes - Matt Warner, Calder, and Crouse. Chronic drought between 2012 and 2016 lowered the water levels and allowed aquatic vegetation to establish lake wide. Then both reservoir refilled completely in 2017 which covered all that vegetation with many feet of water, blocking light, and killing the vegetation that was at the bottom. This vegetation decomposed and caused very low dissolved oxygen in those reservoirs last year. We lost half the fish in Matt Warner and Calder (based on netting catch rates) and all the fish in Crouse.

Big Sandwash- Very low water, this year the boat ramp is unusable, the damage to the fishery is unknown at this time.

Montes Creek Reservoir - Very low water, the damage to the fishery is unknown at this time.

Piute Reservoir - No water stored in the reservoir the 4 of the last 5 years. Complete loss of fishery.

Koosharem Reservoir - No water in 2018 (first time in 20 years). Complete loss of fishery.

Forsyth Reservoir - No water in 2015 and 2018. Complete loss of fishery.

Beaver Mountain Lakes (Kents, Labaron, Puffer) - Low water levels caused low oxygen and algal blooms in 2018 reports of fish kills. Unknown extent, expect complete loss at Puffer and Kents lakes.

DMAD - No water stored in the reservoir the 4 of the last 5 years. Complete loss of fishery.

Parowan Pond - Low water and no inflow caused a complete loss of community fishery.

Enterprise Reservoir, Upper - Reduced to Conservation Pool in 2018, expect some loss to fishery but not a complete kill.

Enterprise Reservoir, Lower - No water 3 of the last 5 years. Complete loss of fishery.

Kolob Reservoir - Extremely low, expect some loss to fishery.

Baker Reservoir - No water stored in the reservoir the 4 of the last 5 years. Complete loss of fishery.

Box Creek Reservoirs (upper and lower) - Extremely low with toxic algal blooms, expect significant loss to fisheries.

Minersville Reservoir - Reduced to conservation pool level (2000 acre/ft). No reported fish kills but not out of the woods yet.

Provo River- The chronic long term drought continues to impact Provo River. Chronic low water levels and subsequent high temperatures and low dissolved oxygen commonly result in partial fish kills on the Lower Provo River just upstream of Utah Lake State Park.

Main Creek- The chronic long term drought have degraded the habitat in portions of Main Creek. Sporadic fish kills occur when stream segments go dry and the river goes subsurface stranding fish in pools with elevated temperatures and no connectivity to flowing water. Portions of Main Creek are seasonally dewatered.

San Pitch River- Sporadic fish kills have occurred when stream segments go dry and the river goes subsurface stranding fish in pools with elevated temperatures and no connectivity to flowing water. Multiple diversions also seasonally dewater portions of the river.

Utah Lake and Jordan River- Drought conditions have contributed to harmful blue green algae blooms the past three years causing reduced angler use.

Yuba Reservoir- Chronic long term drought and changes in water use have led to water levels falling below 5% for the past four years. Although no fish kills have been documented, reduced fish recruitment and lack of angler access have resulted in a significant loss of angler use.

Weber River- Chronic drought has led to several "zero flow" events in the lower Weber River near Uintah (Weber County). Fish impacts have never been fully evaluated.

Woodruff Creek below Woodruff Reservoir- Chronic drought has resulted in low in-stream flows below the reservoir. Fish stranding and associated fish kills are common.

North Fork of the Ogden River- Low/no flows annually result in dry river reaches during certain months of the year.

Newton Reservoir- Chronic drought and increased demands on water from Newton have resulted in multiple year class failures of many sportfish species in Newton Reservoir. Use by anglers has undoubtedly decreased at Newton Reservoir in recent years.

Washington Lake in the Upper Provo Drainage- Reduced to conservation pool. Fish stocking has been discontinued indefinitely. Washington Lake is one of the most popular lakes in the Uintas, so this was a big loss from a recreational standpoint.

Columbia Spotted Frog habitat in the Upper Provo watershed (Summitt County) has been reduced from the chronic drought. Wet meadows, which are the habitat of this species, are reduced.

Kens Lake- Chronic drought and irrigation withdrawals, frequently reduce this reservoir to the conservation pool. This has resulted in fish kills and reduced angler use.

Knight Ideal Community Fishery- Increase annual water temperatures and associated low oxygen levels have resulted in fish kills. Management changes have been implemented but these changes have resulted in reduced angler use.

Scofield Reservoir- Chronic drought conditions have caused harmful blue-green algal blooms in 2016 and 2018, these algal blooms have impacted angling and recreation at the reservoir.

San Rafael River- Chronic drought over the last 10 years have created periods of time with extremely low stream flows. Fish kills have occurred when stream segments go dry.

Price River (downstream of Wellington, Utah)- Chronic drought created periods of time with extremely low stream flows in mid-late summer. Fish kills have occurred when stream segments go dry.

Cleveland Reservoir- Chronic drought and local irrigation demands have resulted in the lowest reservoir levels measured in the last 15 years. Fish limits were raised to 8 fish for the remainder of 2018.

Millers Flat Reservoir- Chronic drought and local irrigation demands have resulted in very low water levels in this reservoir. Fish limits were raised to 8 fish for the remainder of 2018 in order to reduce the potential of a significant fish kill.

Beaver Creek (LaSal Mountains)- Extremely low base flows in 2018 warranted frequent monitoring of an isolated, very small Colorado River cutthroat trout population. The USFS frequently monitors flows on this creek and flows this year were the lowest in a number of years (<1 cfs).

Colorado River (Westwater Canyon) September 2017- Higher than normal water and air temperatures prevented unsafe capture (trammel netting) and handling of humpback chub for Westwater Canyon population estimates. Sampling was adjusted to mitigate stress yet mortalities were still observed.

Colorado River July 2018- Moab Times Independent article chronicles observed fish kill in Colorado river and additional stresses to aquatic life: http://www.moabtimes.com/view/full_story/27588183/article-Aquatic-life-feeling-the-stress-of-low-water--warm-weather?instance=home_outdoors_right

Colorado River August 2018- Collection of Colorado pikeminnow was attempted for hatchery broodstock augmentation on lower Green River. Efforts were mostly unsuccessful and widespread mortality of collected young-of-year pikeminnow were observed (pending results from hatchery personnel). Low survival was likely due to elevated air and water temperatures.

Lastly, Utah seems to be in a long term drought. Our hatcheries are experiencing a decline in water flows from deep artesian springs. Additionally all of our amphibians and several fish species depend on wetlands for survival and as ground water is reduced these wetlands decrease as does the water quality. We are currently seeing declines in these species abundance in many of known wetlands that we monitor.

Attachment 6: Task Force 6 Economic Impacts

As reported by Richie Wilcox

Financial Operations Specialist from Governor's Office of Management and Budget

Potential Economic Impacts of Drought

Direct Effects

- Primarily, the direct effects of drought come in the form of reductions in output and lost revenues for agricultural producers.
- In addition, direct effects of drought include lost production or sales in non-agricultural industries and businesses dependent on water due to forced slowdown or shutdown.
  - Example: Tourism and recreation—reduced skiing from lack of snow, reduced water recreation, etc.

Indirect Effects

- Lost revenues from upstream and downstream entities along the supply chain as a result of the reduced output experienced by the directly-impacted producers. This can lead to "unemployment, increased credit risk for financial institutions, capital shortfalls, and loss of tax revenue for local, state, and federal government."

The interactions between direct and indirect effects are highlighted in the following diagram, with crop producers used as an example: