

# NEW MEXICO DROUGHT PLAN: 2018



**DECEMBER 2018**

## ACKNOWLEDGMENTS

**New Mexico Department of Agriculture**  
**New Mexico Department of Economic Development**  
**New Mexico Department of Game and Fish**  
**New Mexico Department of Finance and Administration**  
**New Mexico Department of Health**  
**New Mexico Department of Homeland Security and Emergency Management**  
**New Mexico Energy, Minerals and Natural Resources Department**  
**New Mexico Environment Department**  
**New Mexico Indian Affairs Department**  
**New Mexico Interstate Stream Commission**  
**New Mexico Office of the Governor**  
**New Mexico State Climatologist**  
**New Mexico Tourism Department**  
**NOAA National Drought Mitigation Center**  
**NOAA National Weather Service**

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**New Mexico Office of the State Engineer**



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## LIST OF ABBREVIATIONS

ALP	Animas-La Plata Project
ANN	Artificial Neural Network
ASR	Aquifer Storage and Recovery
AWRM	Active Water Resources Management
AWSA	Arizona Water Settlements Act
AZ	Arizona
BAER	Burned Area Emergency Response
CEO	Chief Executive Officer
CID	Carlsbad Irrigation District
CDBG	Community Development Block Grant
CRP	Conservation Reserve Program
CWA	Clean Water Act
CWPP	Community Wildfire Protection Plan
CWSF	Council of Western State Foresters
DMWG	Drought Monitoring Work Group
DPG	Drought Plan Group

DRAP	Drought Response Action Plan
DSWB	Dynamic Statewide Water Budget
DTF	Drought Task Force
EIS	Environmental Impact Statement
EOC	Emergency Operations Center
EOP	Explanation of Payments
ERC	Energy Release Component
ERP	Emergency Response Plan
ESA	Endangered Species Act
ESF	Emergency Support Function
FEMA	Federal Emergency Management Agency
FSA	Farm Service Agency
GPCD	Gallons Per Capita Per Day
IAC	Impact Assessment Committee
IRS	Internal Revenue Service
IDMP	International Drought Management Programme
JPA	Joint Powers Agreement
LFC	Legislative Finance Committee
LID	Low Impact Development
LRG	Lower Rio Grande
MRG	Middle Rio Grande
MRGCD	Middle Rio Grande Conservancy District
M	Mitigation
NASF	National Association of State Foresters
NDMC	National Drought Mitigation Center
NDVI	Normalized Difference Vegetation Index
NEPA	National Environmental Policy Act
NM	New Mexico
NIDIS	National Integrated Drought Information System
NMDA	New Mexico Department of Agriculture
NMDFA	New Mexico Department of Finance and Administration

NMDGF	New Mexico Department of Game and Fish
NMDHSEM	New Mexico Department of Homeland Security and Emergency Management
NMDOH	New Mexico Department of Health
NMDP	New Mexico Drought Plan 2018
NMDPS	New Mexico Department of Public Safety
NMED	New Mexico Environment Department
NMED AQB	New Mexico Environment Department Air Quality Bureau
NMED CPB	New Mexico Environment Department Construction Program Bureau
NMED DWB	New Mexico Environment Department Drinking Water Bureau
NMED GWQB	New Mexico Environment Department Groundwater Quality Bureau
NMED SWQB	New Mexico Environment Department Surface Water Quality Bureau
NMEMNRD	New Mexico Energy, Minerals and Natural Resources Department
NMEDD	New Mexico Economic Development Department
NMFA	New Mexico Finance Authority
NMFPTF	New Mexico Fire Planning Task Force
NMHMP	New Mexico Hazard Mitigation Plan
NMIAD	New Mexico Indian Affairs Department
NMISC	New Mexico Interstate Stream Commission
NMLB	New Mexico Livestock Board
NMOSE	New Mexico Office of the State Engineer
NMSP	New Mexico State Parks
NMSU CES	New Mexico State University Cooperative Extension Service
NMTD	New Mexico Tourism Department
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
OMP	Operation and Maintenance Plan
PWS	Public Water Systems
RAWS	Remote Automated Weather Stations
RMP	Resource Mobilization Plan
SBA	Small Business Administration

SDC	State Drought Coordinator
SJWC	San Juan Water Commission
SMPR	Smoke Management Program Rules
SWCC	Southwest Coordination Center
SWCD	Soil and Water Conservation District
T and E	Threatened and Endangered
UCRC	Upper Colorado River Commission
USACE	U.S. Army Corps of Engineers
USBIA	U.S. Bureau of Indian Affairs
USBLM	U.S. Bureau of Land Management
USBOR	U.S. Bureau of Reclamation
USDA	U.S. Department of Agriculture
USDM	U.S. Drought Monitor
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USNPS	U.S. National Park Service
WGA	Western Governors Association
WPR	Water Planning Region
WTB	Water Trust Board

## I. EXECUTIVE SUMMARY

Drought is a common occurrence and has had acute impacts on New Mexico communities, industry, agriculture, and ecosystems. The New Mexico Drought Plan was originally formulated in 2002, and has been subsequently updated five times, with this version being the sixth update. This update was initiated by Governor Martinez with Executive Order 2018-031. Due to time constraints and available resources, this update incorporates current information into the tables used in previous reports.

The *New Mexico Drought Plan: 2018* (NMDP) provides the state with an updated approach to address drought in order to protect its people and resources. It develops a drought response system that is adaptive to changing needs and conditions and capable of being continually upgraded through the incorporation of new information. The plan specifies that subsequent updates should be made every five years.

The Operational Framework (Section IV) develops a decision support system and communication plan by defining the organizational structure, roles, and individuals responsible for implementing the NMDP. The Drought Task Force (DTF) is reaffirmed as the sole official point of contact between the drought plan development and implementation process and the Governor. The NMDP also calls for a newly designated State Drought Coordinator (SDC) housed in the Office of the State Engineer (NMOSE). The SDC will foster efficient communication among groups by maintaining information flows between the DTF and other working groups.

The Drought Monitoring Working Group (DMWG), as described in Section V, will continue to monitor conditions and work with the U.S. Drought Monitor (USDM) to provide weekly updating of the drought intensity categories for the state, and communicate them to the DTF. The Drought Plan Group (DPG) will meet on an as-needed basis to support the DTF and maintain, update, and communicate the drought plan.

Section VI describes some of New Mexico's drought vulnerabilities and associated impacts. As directed by the current Executive Order, this plan has a strong focus on drought response. Section VII-Response Actions, defines the drought stages, triggers, and response actions associated with those triggers. The three drought stages are: Drought Watch Stage, Emergency Drought Stage, and Exceptional Drought Stage. The trigger to initiate Emergency Drought is 50% of the state in USDM category D2 or higher. The trigger to initiate Exceptional Drought is 20% of the state at USDM category D4. These triggers will be constantly evaluated based on the analysis of current drought conditions. Response actions include DTF meetings, as well as agency-specific responses.

Section VIII describes recommended mitigation actions for drought impacts within the following sectors: agriculture, drinking water, water quantity, wildfire and wildland fire, and watersheds.

Section X-Future Work, discusses steps and strategies that can be explored to further refine New Mexico's drought response system. These include communication and collaboration with stakeholders, improvements to impact and vulnerability assessments, and evaluating/developing additional data for use as drought triggers.



Bisti De-Na-Zin Wilderness, San Juan County, New Mexico. (Photo shared by Bernadette B. Fontenelle)



## II. HISTORY AND PURPOSE

Drought is a common occurrence in New Mexico, having impacted the Land of Enchantment since prehistoric times. During the more recent historical period, drought has had particularly acute impacts during the years 1900-1910, 1932-1937, 1945-1956, 1974-1977, 2002-2004, and 2011-2013. Since 1998, New Mexico governors have issued seven emergency drought declarations in the form of executive orders. Drawing on work done by various state agencies and other southwestern states, the first New Mexico Drought Plan was introduced and implemented in 2002. Since then the drought plan has been updated five times in conjunction with drought declarations.

On July 11, 2018, Governor Susana Martinez signed Executive Order 2018-031, ordering another update of the existing drought plan. The New Mexico Drought Task Force (DTF) met on September 24, 2018, and approved an expedited process to update the drought plan. The current update has been titled *New Mexico Drought Plan: 2018* (NMDP).

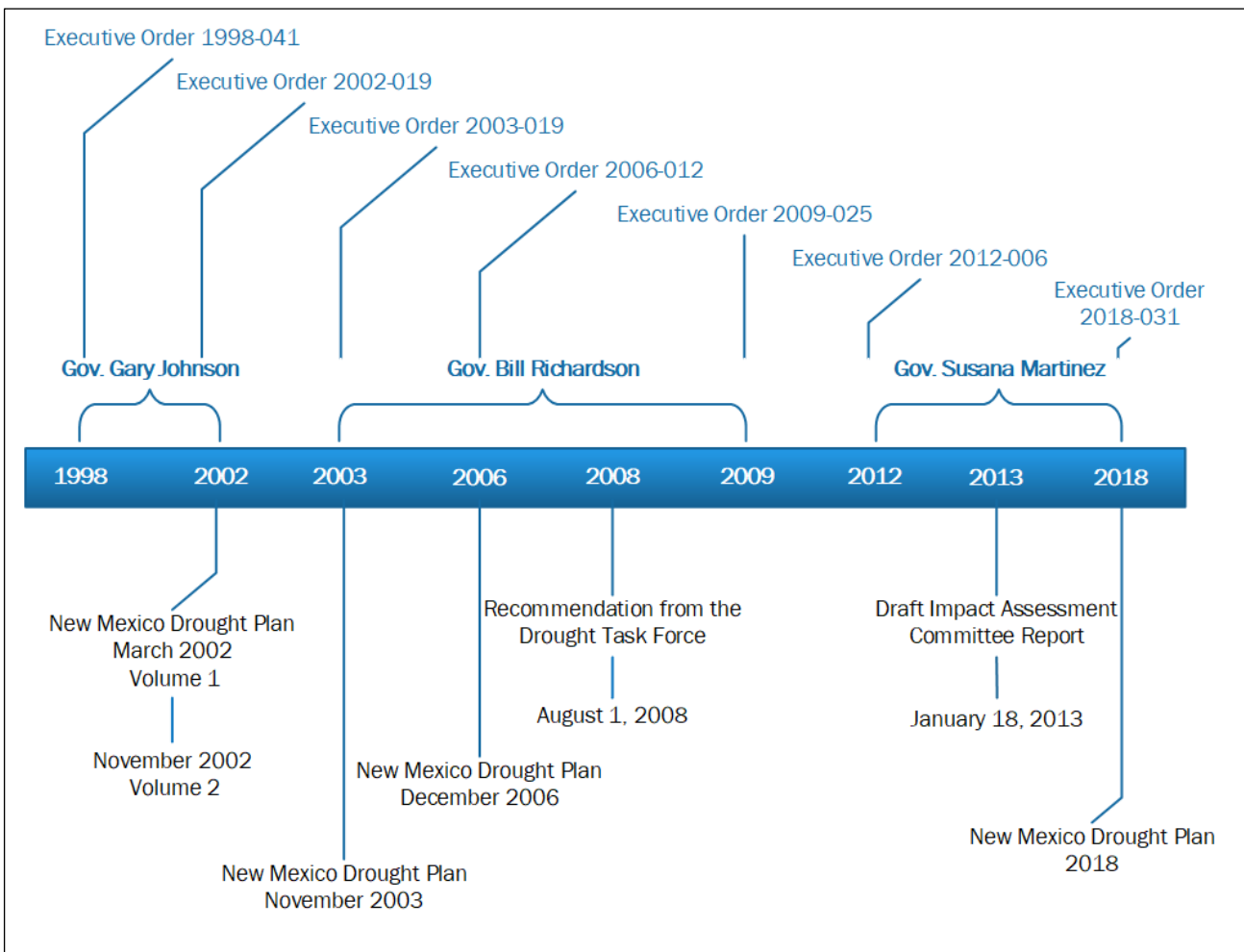


Figure 1. Timeline and Evolution of the New Mexico Drought Plan

## **Summaries of Executive Orders Related to Drought**

### **Term of Governor Gary Johnson (1995-2002)**

#### *Executive Order 1998-041*

In October 1998, Governor Gary Johnson directed New Mexico to create a drought plan. The Governor described the behavior of drought in New Mexico as normal and periodic, triggering natural disturbances that negatively impact agricultural production and quality of the land, air, biomass, and water. These issues are difficult to respond to as drought evolves slowly, which presents challenges for efficient response.

This Order declared New Mexico to be in a state of drought whenever the continuation of rising temperatures and decreasing amounts of precipitation and snowpack prolong the dry conditions and harm surface water availability. The DTF was established to review and edit the drought plan that had been drafted by the New Mexico Office of the State Engineer (NMOSE). State agencies were directed to identify specific vulnerabilities within their jurisdictions to provide mitigation strategies to the DTF. Agencies were also asked to make recommendations to the Governor on how to respond efficiently to drought. Governor Johnson encouraged individuals to identify drought vulnerabilities within their communities and take conservation actions when possible.

#### *Executive Order 2002-019*

In April 2002, an Executive Order was issued by Governor Johnson in response to a drought that intensified during the dry winter of 2001-2002. At that time, reservoirs were at their lowest points in two decades, and the snowmelt runoff forecast was one of the five lowest in the previous five decades. Drought conditions were expected to worsen, increasing fire danger and reducing stream runoff levels, potentially impacting compliance with the Endangered Species Act (ESA) and interstate compact deliveries.

### **Term of Governor Bill Richardson (2003-2010)**

#### *Executive Order 2003-019*

In May 2003, Governor Bill Richardson declared an emergency drought condition for the state. Per Executive Order 2003-019, the extremely dry winters during the preceding seven years contributed to altered ecological regimes in which snowpack, runoff, streamflow, reservoir storage, and soil moisture were at their lowest levels since 1978.

The Order stated that the restoration of surface and subsurface flow to streams and reservoirs would take years of high precipitation. The Order outlined the purpose, tasks, and membership of the DTF. Additionally, the Order identified the need for funding assistance to alleviate the deterioration of natural resources and environmental conditions, and stated that the funds would be released by the Office of the Governor upon the recommendation of the DTF.

The Order directed the DTF to continuously examine and monitor statewide drought conditions and recommend appropriate response measures to be implemented to mitigate drought impacts. The DTF was chaired by the State Engineer and included cabinet secretaries from various state agencies. (see Table 1).

#### *Executive Order 2006-012*

In March 2006, Governor Richardson once again declared a state of drought emergency in New Mexico, and directed state agencies to implement water-savings strategies and begin preparations to assist in drought relief efforts across the state. The Governor instructed the DTF to prepare recommendations on additional water

conservation and drought mitigation strategies that could be implemented. He also ordered all executive branches of state government to apply for emergency funds to carry out the existing drought plan.

#### *Executive Order 2009-025*

In June 2009, Governor Richardson issued a disaster declaration for the state due to drought. The Order directed the New Mexico Department of Finance and Administration (NMDFA) to make emergency financial resources available, the New Mexico Department of Homeland Security and Emergency Management (NMDHSEM) to coordinate all drought responses and requests for assistance, and the New Mexico National Guard to provide military support to civil authorities as needed.

#### **Term of Governor Susana Martinez (2011-2018)**

#### *Executive Order 2012-006*

In May 2012, Governor Martinez declared New Mexico to be in an emergency state of drought and called for additional resources for mitigation due to its severity. This drought was compared to those of 1955 and 2011, then the driest years on record. The DTF was directed to continue to convene quarterly for two years to assess the impacts of drought severity on the state's resources and economy, and make recommendations to the governor of intermediate actions and long-term mitigation strategies that could help stabilize environmental and economic conditions. The Governor also ordered a review of the existing drought plan, and revision as necessary.

#### *Executive Order 2018-031*

In July 2018, Governor Martinez ordered the DTF to review and revise the drought plan with a focus on drought planning, mitigation, and response. Executive Order 2018-031 stated that as of July 11, 2018, New Mexico had received less than half of the average precipitation for the water year, resulting in record low snowpack and spring runoff. Drought impacts are described as being beyond the response capability of local communities.



Elephant Butte Reservoir. (Photo shared by Molly Magnuson)

#### **Purpose of the New Mexico Drought Plan**

The purpose of this document, *New Mexico Drought Plan: 2018* (NMDP), is to provide New Mexico with an updated approach to address drought to protect its people and cultural and natural resources through: a) synthesizing previous drought plan efforts and streamlining the content; b) making strategic adjustments to the previous drought plan; and c) laying a foundation for future collaborative improvements. To accomplish these objectives the NMDP:

- defines an updated drought operational framework to be followed in addressing drought and drought-related activities (Section IV)
- explains monitoring activities to identify drought status and triggers for the different stages of drought (Section V)
- describes impact and vulnerability assessment (Section VI)
- outlines the responses to drought based on triggers and impact conditions (Section VII)

- identifies long- and short-term mitigation activities that can be implemented to prepare for drought and to minimize the impacts of future droughts (Section VIII)
- compiles impact assessments as presented by relevant state agencies (Appendix C)
- acts as a catalyst for the creation and implementation of local drought planning and response efforts, including the drought plan update process (Section IX)
- includes a future work section describing potential work that is outside of the scope of this plan (Section X)

In designing the content of the NMDP, every effort was made to use existing partnerships and the input of various stakeholders from state and federal agencies to provide feedback on the effectiveness of planned or implemented responses and mitigation measures. Additionally, previous drought plans have been incorporated into the update.

The NMDP is intended to complement the ongoing water resource planning efforts of regional water planners. The New Mexico Regional Water Planning Guidelines and the New Mexico State Water Plan clearly identify drought planning as an important item of discussion in any water planning effort. It is anticipated that the measures and actions outlined in the NMDP will be incorporated into existing and future water planning efforts.

Summaries and web links have been used to streamline the contents of the plan. To allow access of the NMDP to the largest possible audience without the need for high document publication costs, the entire plan has been placed online at <http://www.ose.state.nm.us/Drought/index.php>. In addition to hosting the NMDP, the website also includes links to current drought conditions and updates on the Drought Monitoring Work Group (DMWG).

The NMDP should be considered a document to which continual review, evaluation, and revision must be made to reflect successes, failures, and changes.

## **Value of Drought Planning**

Drought planning develops an integrated drought response system identifying vulnerabilities, impacts, and responses. Documenting initiatives and programs in a drought plan can improve the potential to obtain public financing.

In 1998, New Mexico initiated planning efforts to be more proactive and anticipate drought impacts. Those efforts, along with the subsequent plan updates, resulted in a comprehensive drought plan that addresses drought response and potential vulnerabilities in advance of drought.

New Mexico drought impacts can be severe and recovery can be challenging. Historically impacts have included:

- early and severe wildfire seasons
- adverse effects on agriculture
- loss of tourism resulting from reduced snowpack, streamflows, and recreational opportunities
- low reservoir levels
- shortages in municipal water supplies
- degradation of wildlife habitat
- reduced rangeland and forest health

- potential health problems for humans
- other meteorological, agricultural, hydrological, socioeconomic, and ecological consequences

This plan benefits drought assessment and response efforts in the State by developing an adaptive organizational infrastructure that improves systems monitoring as needs and impacts change, supporting collaboration among stakeholders, and integrating these efforts with policy experts and decision-makers. These components are further described in the subsequent sections.

### III. DEFINITION OF DROUGHT

Drought is a normal characteristic of the climate in New Mexico, and unlike most natural disasters, occurs slowly and persistently. Due to this, government response to drought has typically been slow and fragmented, with little focus on preparedness and mitigation.

Drought is a complex time-dependent physical process that can adversely impact regions on both the macro and micro scales. Drought is difficult to define succinctly, and there is no universally accepted definition. Drought has the following characteristics:

- unlike floods and other natural disasters, it is not a discrete event,
- it is often the result of many complex factors, and may not have a well-defined beginning or end, and
- its impacts vary by geographic location and/or economic sector, making the definition of drought specific to each affected group or location.



Carp in the Rio Grande near San Marcial, NM (Photo shared by Ken Peterson)

#### Definitions of Drought

The most commonly used drought definitions are based on meteorological, agricultural, hydrological, socioeconomic, and ecological impacts.

##### *Meteorological*

Meteorological drought is a period of substantially reduced precipitation. It is commonly defined as an interval of time, generally on the order of months or years, during which the actual moisture supply at a given place consistently falls below the climatic average moisture supply.

##### *Agricultural*

Agricultural drought occurs when there is inadequate soil moisture to meet the needs of a particular crop at a particular time. Agricultural drought commonly occurs after or during meteorological drought, but before hydrological drought. Agricultural drought can also adversely impact livestock and other dry-land agricultural operations.

### *Hydrological*

Hydrological drought occurs when there are deficiencies in surface and subsurface water supplies. It is measured as reduced streamflow, snowpack, reservoir, and groundwater levels. A delay usually occurs between the lack of precipitation and later deficits observed in water measurements. Due to this, hydrological response tends to lag behind other drought indicators.

### *Socioeconomic*

Socioeconomic drought occurs when physical water shortages affect the health, well-being, and quality of life of people, or when the water shortages adversely impact economic activity.

### *Ecological*

Ecological drought occurs when there is a prolonged and widespread deficit in naturally available water supplies, creating stresses across ecosystems.



Huerfano Mesa near Dziłth-na-o-dith-hle, New Mexico.  
(Photo shared by Bernadette B. Fontenelle.)

## **IV. . OPERATIONAL FRAMEWORK**

This section documents the operational framework of the NMDP. It designates the individuals tasked with implementing the plan and includes steps to communicate the drought response actions to the public.

The operational framework, based on National Drought Mitigation Center (NDMC) planning guidelines, outlines the organizational structures and membership necessary to carry out the various aspects of the drought plan including:

- conducting drought monitoring
- developing an adaptive drought response system
- initiating mitigation actions
- updating the drought plan

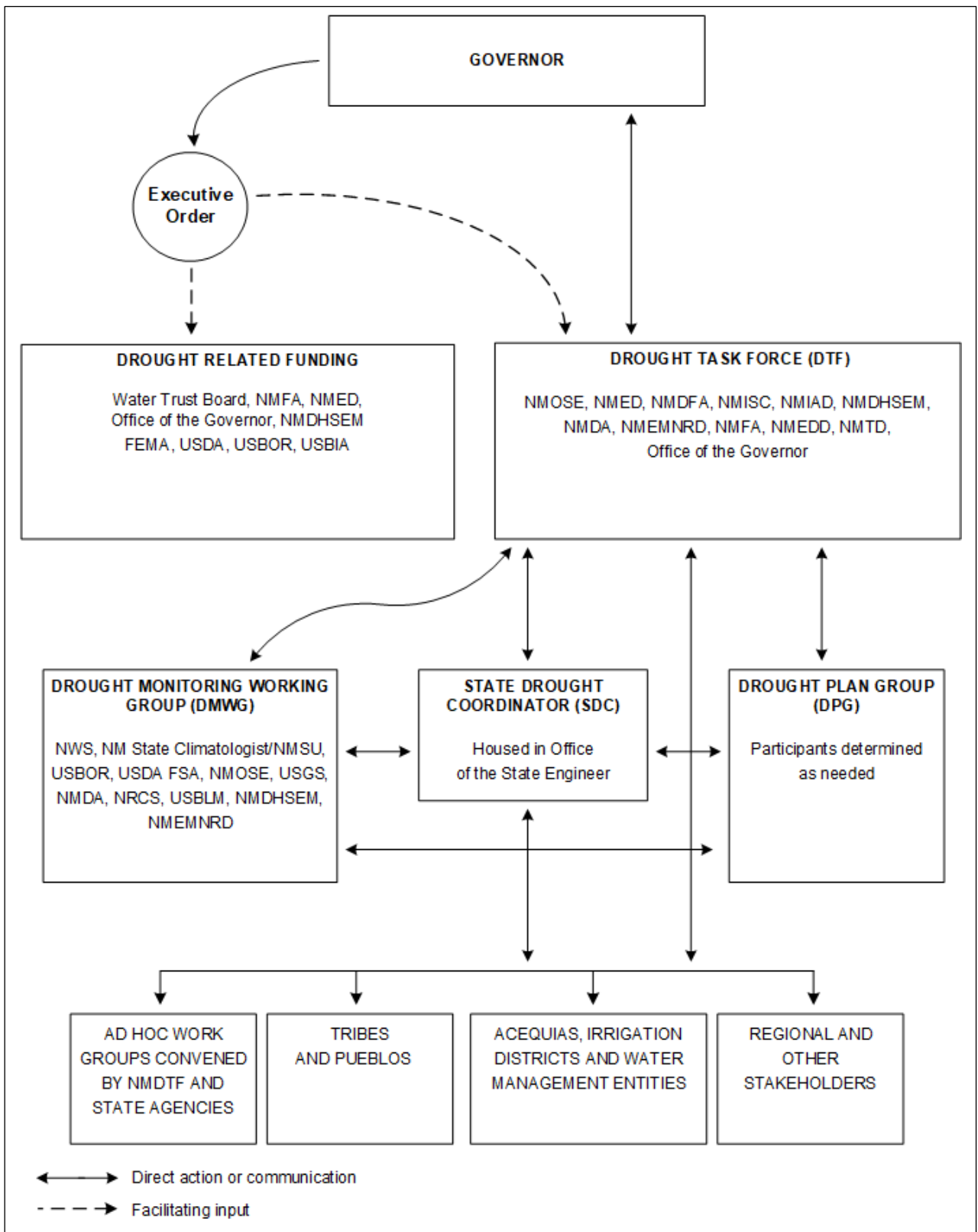


Figure 2. Operational Framework

## **Governor of New Mexico**

The Governor of New Mexico calls upon the DTF to provide drought updates and recommendations, and is the final authority in declaring drought emergencies. This plan sets a schedule for future meetings with the DTF. The Governor shall, on a yearly basis, be updated on drought conditions, status, and recommended actions.

## **Drought Task Force**

The DTF oversees the implementation of drought-preparedness activities in the State of New Mexico (see Table 1). Additionally, the DTF plays major roles in intergovernmental drought preparedness, response coordination, agency collaboration, and media information releases. The DTF is the singular official channel to the Governor for drought plan activities in the State. Previous executive orders directed the DTF to prepare recommendations for the Governor's consideration. In response to these orders, the DTF has submitted reports that review current and ongoing drought mitigation activities. This plan maintains the DTF's roles, and schedules future meetings based on drought severity in the State.

## **State Drought Coordinator**

The State Drought Coordinator (SDC) will be the centralized point of contact for drought planning, coordination, and response efforts in the State. The primary role of the SDC will be to facilitate information sharing to the DTF, various state, federal, tribal, and local governments, and the general public. This position will be housed in the New Mexico Office of the State Engineer (NMOSE), and have the following responsibilities:

- providing regular updates to the DTF and DTF appointed work groups
- serving as a community liaison and information facilitator
- facilitating agency work groups and other community partnerships
- establishing priorities and meeting schedules for the DTF appointed work groups
- engaging with agencies and community drought groups to compile impacts and needs
- maintaining NMDP continuity by serving as the point of contact for plan activity and updates

## **Drought Monitoring Work Group**

The DMWG, chaired by the State Climatologist, meets monthly and includes water resources, climate, and natural resources professionals from both state and federal agencies. The group is responsible for monitoring available climate, hydrologic, and other pertinent data to analyze current drought conditions in New Mexico. The DMWG provides status reports on various stages of drought that trigger actions by the DTF, and is responsible for making recommendations to the DTF on potential drought executive orders. The DMWG and the SDC provide regular updates to the DTF.



Table 1. Drought Task Force Members

DTF Members August 2018			
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## **Drought Plan Group**

The Drought Plan Group (DPG) maintains, updates, and communicates the drought plan to support the planning process. The DPG will work with the SDC and the DMWG to summarize impact assessments from various agencies, compile lists of drought impacts specific to each agency, communicate drought plan activities to different audiences, and conduct other activities as directed. The DPG meets as needed in response to elevated drought stage or input from the DTF or the DMWG.

### **DPG Members in 2018**

New Mexico Office of State Engineer

New Mexico Interstate Stream Commission

New Mexico Water Resources Research Institute

New Mexico State Climatologist

New Mexico Department of Homeland Security and Emergency Management

New Mexico Department of Agriculture

New Mexico Environment Department

New Mexico Department of Health

New Mexico Energy, Minerals and Natural Resources Department

NOAA National Weather Service

### **Drought Task Force Work Groups**

The DTF work groups are convened as needed by the DTF to address specific issues that require targeted action.

### **Drought Related Funding**

A number of drought-related funding sources exist including, but not limited to:

- Drinking Water Revolving Loan Fund (NMFA, NMED)
- Local Government Planning Fund (NMFA)
- Public Project Revolving Fund (NMFA)
- Water Trust Board (NMFA, Water Trust Board)
- Emergency drought relief (USDA, USBIA, Office of the Governor, NMDHSEM)
- Drought contingency planning (USBOR)
- Emergency response and hazard mitigation planning (FEMA)

The requirements for eligibility vary by program and are available from the respective agencies.

## V. COORDINATED DROUGHT MONITORING

Drought monitoring, assessing current conditions, and predicting future drought development are key to implementing and updating the NMDP. The U.S. Drought Monitor (USDM) is used by the DMWG to monitor drought in the state. The USDM analyzes and maps (see Figure 3) current drought conditions using five drought intensity categories. It is produced weekly through the joint efforts of the National Drought Mitigation Center (NDMC), the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Department of Agriculture (USDA).

In New Mexico, the Drought Monitor is produced with input from the DMWG. The DMWG meets on a monthly basis, with each participating agency presenting a drought report. Participating agencies include the National Weather Service (NWS), Natural Resources Conservation Service (NRCS), U.S. Geological Survey (USGS), New Mexico Office of State Engineer (NMOSE), New Mexico Department of Agriculture (NMDA), New Mexico Energy Minerals and Natural Resources Department (NMEMNRD), U.S. Bureau of Reclamation (USBOR), U.S. Army Corps of Engineers (USACE), and the U.S. Department of Agriculture Farm Service Agency (FSA).



Gallegos SNOTEL site: February 2018 (left). Garita Peak SNOTEL site in the Valles Caldera: February 2017 (right).

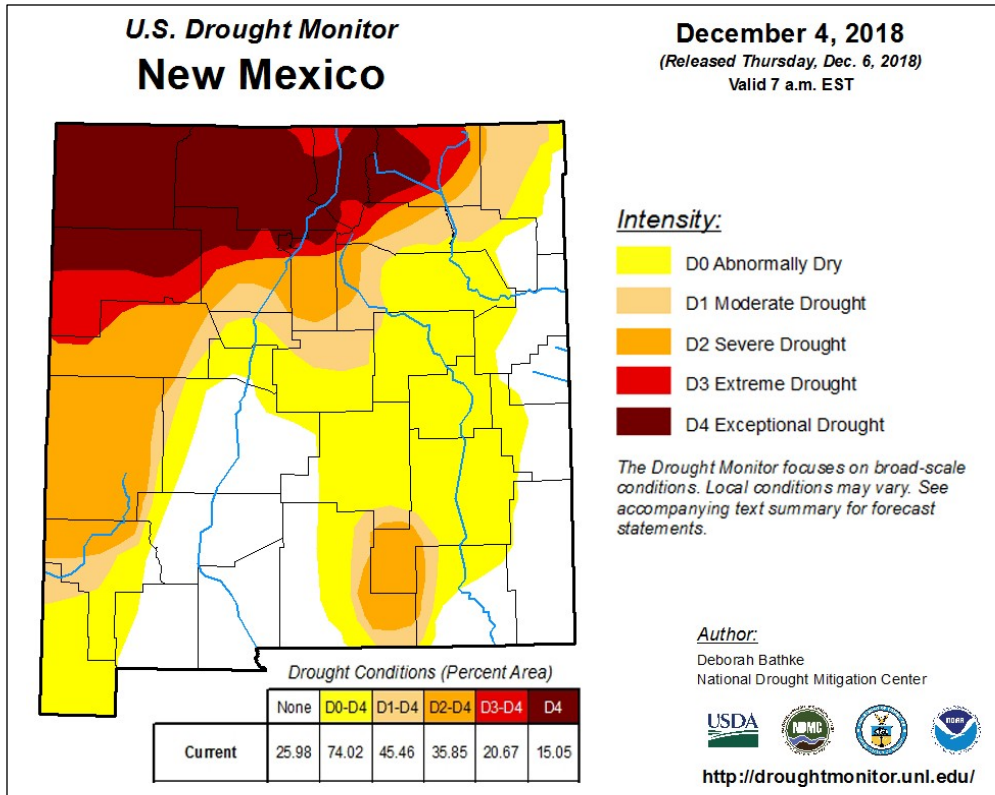


Figure 3. Example USDM data outputs

Figure 3a. Example of a recent USDM map for New Mexico, including percentages of state in types of drought

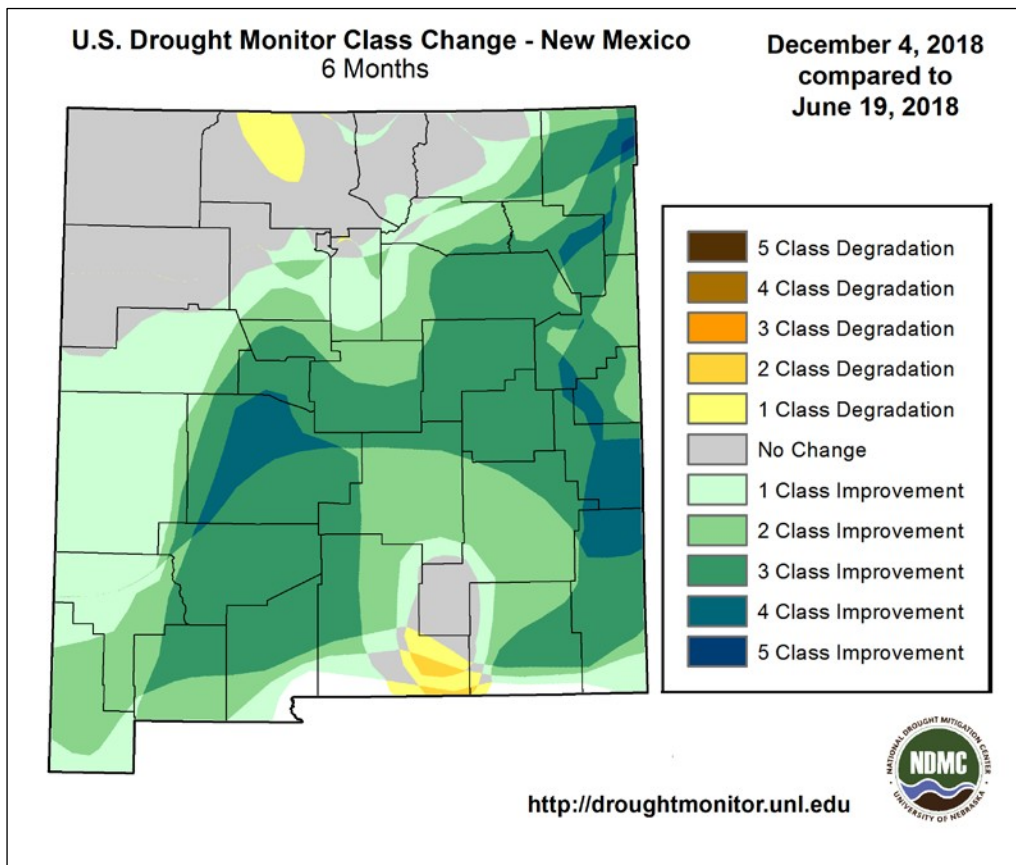


Figure 3b. New Mexico map of drought change compared to six months prior

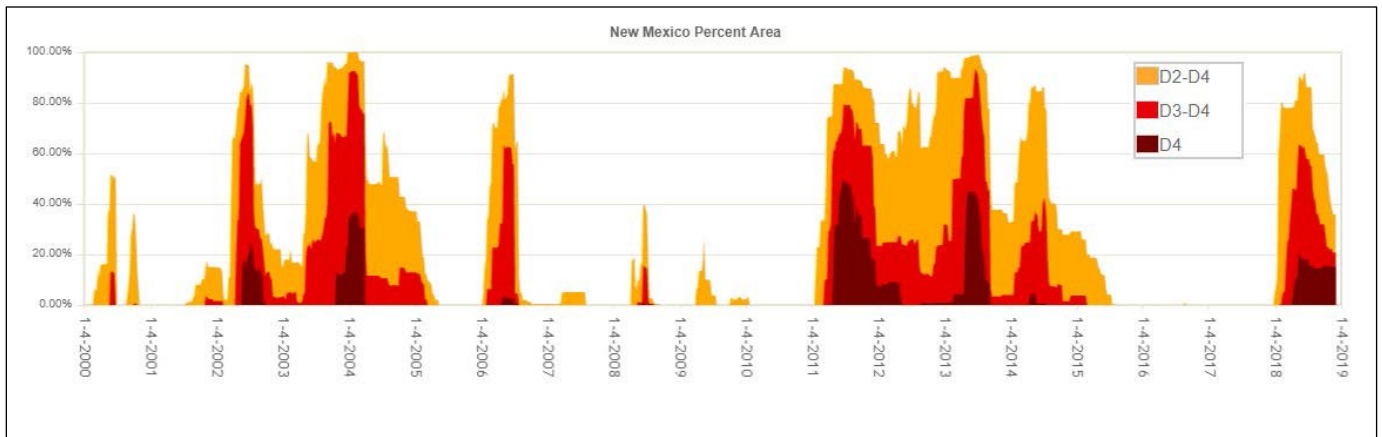


Figure 3c. New Mexico drought time series of drought level D2 and above

A network of data gathering sites, operated by various state and federal agencies, provide the most current climate, streamflow, and reservoir information for review by the DMWG. Data from these sites are reviewed as either raw data, or more refined indices of drought-related conditions. Additionally, field observations made by DMWG participants are incorporated into the discussions. Any changes to the current state drought classifications are then recommended to the Drought Monitor author by the State Climatologist and the NWS DMWG representative. The USDM is an analysis of drought conditions and does not include any forecast information.

The process and some of the data sources used by the DMWG are described below.

- The NWS collects and analyzes data from weather stations throughout New Mexico.
- The NWS integrates a variety of drought-related data into various indices that reflect current conditions, trends, and historic conditions.
- The NRCS operates a network of snowpack monitoring stations throughout the state that provide snow depth and water content data that is reviewed by the DMWG.
- The NRCS, USBOR, and USACE provide reservoir storage level data that is reviewed.
- The NMDA maintains a statewide network of crop status and soil moisture monitoring sites that provides data for review.
- The USGS maintains, operates, and provides data from a network of streamflow measuring stations throughout the state of New Mexico.
- The collected and compiled data are presented to the DMWG, and subsequently the Drought Monitor authors for discussion. The authors then create the final maps.

It is possible that indices other than the Drought Monitor may be developed and used in the future that are specific to New Mexico. Water budget based indices are one potential approach under consideration, as discussed further in Section X-Future Work.

## VI. IMPACT AND VULNERABILITY ASSESSMENT

Vulnerabilities are increased susceptibilities to drought impacts, and are understood by identifying and assessing impacts (UNCCD, 2016). Drought impacts are the consequences of physical drought, including but not limited to crop yield losses, reservoir depletions, and loss of vegetation in rangelands.

The first step in assessing vulnerability is an identification of the impact, which is a measure of the effects that have already occurred. The assessment of vulnerability determines the structure of underlying systems and identifies how the systems will be impacted by drought. Impact and vulnerability assessments provide the basis for drought response and mitigation planning.

Impact and vulnerability assessments have been performed by various water users throughout the state to differing degrees. Examples include utilities, specific water basins, and informal assessments such as a rancher or agricultural producer making decisions in response to drought or to mitigate risks from drought.

### **Current Understanding of New Mexico Drought Vulnerabilities**

Drought vulnerabilities can affect a wide range of economic, environmental, and social activities. The relative vulnerability of these activities to drought depends on the water source and demands, how these demands are met, and the water supply available to meet these demands.

Activities depending solely on rainfall and soil moisture, including dry-land farming, ranching, and some ecological water uses, are most at risk from drought. These activities can suffer adverse effects even with short-term droughts.

Still at relatively high risk are those water uses depending on instream flows. Examples include run-of-the-river irrigation, riparian habitat protection, and recreational water uses.

Urban and agricultural water users in New Mexico relying on surface water reservoir supplies and/or groundwater resources that are not adversely affected by concentrated levels of high pumping are less exposed to the risk of drought.

As recognized in the State Hazard Mitigation Plan, it is also important to note that any climate change would likely increase vulnerability to natural hazards, including drought and wildland fire. Increased warming, drought, and insect outbreaks, all caused by or linked to climate change, have increased wildfires and severity, and their associated impacts to people and ecosystems in the Southwest. Fire models project more wildfire and increased risks to communities across extensive areas.

### **Impact Reporting**

An essential component of a drought response system is an efficient method for consistent reporting of both drought impacts and early warning impact signals. This has proven to be a significant challenge in New Mexico and across the Southwest. Reporting takes added time and effort from affected parties already struggling to cope with drought, and who may need additional assurances that such efforts will contribute to investments in solutions (Lackstrom et al., 2013; Meadow et al., 2013).

Decision-makers from all levels rely upon the systems already in place to assess the magnitude of vulnerabilities and to prioritize drought planning and response efforts (Jacobs et al., 2005). To adapt to rapidly changing conditions, it would be useful to have an adaptive organizational infrastructure that continually improves systems monitoring, supports collaborative stakeholder research and monitoring of impact reporting, and integrates these efforts with policy experts and decision makers (Lackstrom et al., 2013). The organizational framework laid out in this plan is intended to provide for adaptive response.

## VII. RESPONSE ACTIONS

### Response Action Planning

Drought response is a set of measures and actions designed to reduce vulnerabilities to drought and lessen the impacts of drought (International Drought Management Programme (IDMP) 2018). Responses to drought documented by the IDMP address the following categories: water and food supplies for humans, livestock, wildlife, insurance compensation, public aid and tax relief, rehabilitation and recovery programs, fire control programs, and adapted regulations and policies.

Triggers are an important part of drought response because they clearly define the timing and selection of responses. Previous New Mexico drought plans identified seven stages of drought that would be used to trigger actions by various groups and work groups associated with the DTF. Additionally, state agencies used an impact assessment approach that identified drought impact conditions and signaled the need for certain agency-specific responses. This approach has proven difficult to implement, as the specific trigger system was not used to initiate responses to drought. The impact assessment did go into effect for certain programs such as the USDA drought relief program.

The NMDP focuses on drought response in order to meet the objectives described in *Executive Order 2018-031*. It simplifies and streamlines the previous process by reducing the number of drought stages from seven to three (see Table 2). Based on the best professional judgment of both the State Climatologist and the NWS DMWG representative, two triggers have been developed to initiate the elevated drought stages.

Trigger 1: Emergency Drought Stage occurs when 50% or more of the state is at D2 levels or higher as documented by the USDM

Trigger 2: Exceptional Drought Stage occurs when 20% or more of the state is at D4 levels as documented by the USDM

It should be noted that these percentages may be adjusted as necessary in the future based on re-evaluation after drought.

Table 2. Trigger-based drought responses

<b>DROUGHT STAGE</b>	<b>TRIGGER</b>	<b>DROUGHT TASK FORCE MEETING SCHEDULE</b>	<b>RESPONSES</b>
<b>WATCH</b>		DTF convenes yearly	<ul style="list-style-type: none"> <li>• DMWG meets monthly</li> <li>• Work groups meet as directed by the DTF to provide updates to SDC</li> <li>• SDC provides annual updates to the DTF, and as requested</li> <li>• DTF provides annual updates to the Governor, and as requested</li> </ul>
<b>EMERGENCY</b>	<b>50% or more of the state is at D2 levels or higher as documented by the USDM</b>	DTF convenes twice a year and receives updates on previous water year	<ul style="list-style-type: none"> <li>• DMWG continues to meet monthly</li> <li>• Work groups continue to meet as directed by the DTF to provide updates to SDC</li> <li>• SDC provides quarterly updates to the DTF, and as requested</li> <li>• DTF considers making recommendation to Governor to issue an Executive Order                             <ul style="list-style-type: none"> <li>○ DMWG determines whether to make an Executive Order recommendation to DTF</li> <li>○ factors considered: percent of state in D3, D4; duration; impacts</li> </ul> </li> </ul>
<b>EXCEPTIONAL</b>	<b>20% or more of the state is at D4 levels as documented by the USDM</b>	DTF convenes at same interval as during Emergency Stage, with additional meetings as necessary	<ul style="list-style-type: none"> <li>• DMWG continues to meet monthly</li> <li>• Work groups continue to meet as directed by the DTF to provide updates to SDC</li> <li>• SDC provides monthly updates to the DTF, and as requested</li> <li>• DTF strongly considers making recommendation to Governor to issue an Executive Order                             <ul style="list-style-type: none"> <li>○ DMWG determines whether to make an Executive Order recommendation to DTF</li> <li>○ factors considered: percent of state in D3, D4; duration; impacts</li> </ul> </li> </ul>

New Mexico state agencies have actively participated in drought response by providing impact assessments through the Impact Assessment Committee (IAC), which is typically convened by the DTF. They have sets of internally approved responses to drought that are designed in accordance with impacts specific to their agencies, here termed impact conditions. The updated set of agency emergency responses to impact conditions is summarized in Table 3 below.



Table 3. State and Federal agency response

<b>TABLE 3. STATE AND FEDERAL AGENCY RESPONSE</b>	
<b>IMPACT CONDITIONS</b>	<b>EMERGENCY RESPONSE ACTIONS</b>
<b>Agriculture (Agencies: FSA, NMDA, NMSU CES)</b>	
Production/yield losses and increased costs	<ul style="list-style-type: none"> <li>• USDA payouts conditioned</li> <li>• Insurance</li> <li>• Emergency grazing on CRP acreage program</li> </ul>
Increased drought levels	<ul style="list-style-type: none"> <li>• Climate conditions monitoring and communication</li> <li>• NMSU CES workshops</li> <li>• NMDA hay sourcing</li> <li>• IRS tax relief</li> <li>• NMDA EOC coordination</li> </ul>
<b>Drinking Water (Agencies: NMED, NMDOH, NMDHSEM, NMOSE)</b>	
Public Water Systems (PWS) drought-induced operation system failures (emergency declaration required for emergency funding to PWS)	<ul style="list-style-type: none"> <li>• NMED receives funding (flow chart procedure)</li> <li>• PWS follow their Emergency Response Plans (ERP)</li> <li>• Distribute NMED Emergency Fact Sheet (develop)</li> <li>• Support identified single-water-source/vulnerable PWS</li> <li>• Emergency water hauling</li> </ul>
Water Shortages	<ul style="list-style-type: none"> <li>• suggests implementation of tiered pricing structure to PWS</li> <li>• NMED CPB loans</li> </ul>
Increased PWS contaminants and exceeded max levels	<ul style="list-style-type: none"> <li>• Public alerts - NMED DWB and PWS boil water advisories</li> <li>• NMED DWB and PWS require installation of treatment</li> <li>• Test potable water provided by water haulers</li> </ul>
Risk of private wells running dry	<ul style="list-style-type: none"> <li>• Provide residents with lists of alternative water sources (or water hauling sites)</li> <li>• Provide emergency response funding to cover purchase of water for human consumption and basic hygiene (e.g., showering stations).</li> </ul>
<b>Water Quantity (Agencies: NMOSE, NMISC)</b>	
Colorado River and Upper Colorado River Basin Compacts – San Juan compact deliveries and water competition	<ul style="list-style-type: none"> <li>• Voluntary rotation among ditches and for cities along the Animas River (ditches / cities / NMOSE)</li> <li>• Coordinate on proposed plans for ALP Operations for delivery within NM (SJWC/NMISC proposal to NMOSE)</li> <li>• Assess Navajo Reservoir levels</li> </ul>
La Plata River Compact - Water availability severely impacted by reduced flows	<ul style="list-style-type: none"> <li>• Make a compact call on Colorado for La Plata Compact deliveries to NM (NMISC in cooperation with the La Plata Conservancy District)</li> </ul>
Pecos River Basin Compact – NM delivery obligations, increased pumping likelihood, and Endangered Species Act (ESA) flow requirements	<ul style="list-style-type: none"> <li>• Prepare for possible NMISC pumping to augment CID supply</li> <li>• Continue to monitor ESA flows</li> </ul>
Rio Grande Basin, Amended Costilla Creek Compact – NM users quantity reduction	<ul style="list-style-type: none"> <li>• NM water master administration to ensure compliance</li> </ul>
Rio Grande Basin, San Juan-Chama Project – Supply impairment in both states	<ul style="list-style-type: none"> <li>• Create project allocation monitoring condition</li> </ul>

**TABLE 3. STATE AND FEDERAL AGENCY RESPONSE**

IMPACT CONDITIONS	EMERGENCY RESPONSE ACTIONS
<b>Wildfire</b> (Agencies: Southwest Coordinating Group, USFS, BLM, USBIA, USFWS, USNPS, NMEMNRD, DHSEM, NMED, NMDPS)	
Fire notification	<ul style="list-style-type: none"> <li>• Monitor field conditions</li> <li>• Fire danger potentials (ERC chart)</li> <li>• SWCC website data dissemination</li> </ul>
Fire danger increases	<ul style="list-style-type: none"> <li>• Increase fire restrictions</li> <li>• Closure of public lands (focused to minimize rural effects)</li> <li>• Law enforcement to encourage responsible citizen stewardship</li> <li>• Statewide mobilization of firefighting resources (develop)</li> </ul>
Fire; air quality	<ul style="list-style-type: none"> <li>• Public and firefighter safety first priority</li> <li>• Type III organizations for each Interagency Zone Dispatch area for initial attack efforts (continue to develop)</li> <li>• Prioritize incidents</li> <li>• Coordinate evacuations</li> <li>• Public notification of smoke impacts</li> </ul>
Forest and watershed health declines	<ul style="list-style-type: none"> <li>• Surveys of insect and disease outbreaks</li> <li>• Identify priority watersheds, develop plans and fund post-fire actions</li> <li>• Monitor rare plant populations and take action upon impacts identified, including alternatives to livestock use reductions, fencing, trapping rodents, and seed collection</li> </ul>
<b>Wildlife</b> (Agency: NMDGF)	
Reduced streamflow effect on endangered species of aquatic plants and animals	<ul style="list-style-type: none"> <li>• Briefing for governor on threatened and endangered (T and E) species obligations</li> <li>• Implement alternative plans for sustaining existing habitat and/or instream flows, and/or develop emergency habitats</li> </ul>
Forage resource damage	<ul style="list-style-type: none"> <li>• Consider careful reduction of big game species populations</li> </ul>
Reduced grain production at waterfowl preserves	<ul style="list-style-type: none"> <li>• Local farmer emergency agreements for waterfowl feeding alternatives</li> </ul>
Reduced available wildlife drinking water and food supply	<ul style="list-style-type: none"> <li>• <a href="#">NMDGF wildlife depredation program</a>, including public education programs on drought wildlife survival and hunting restrictions</li> </ul>
Deteriorated fish habitat and reduced fishery productivity	<ul style="list-style-type: none"> <li>• Temporarily curtail fish stocking programs</li> <li>• Curtail hatchery production and reallocate fish inventory to alternative recreational fishing sites</li> </ul>
Loss or impairment of fish and wildlife resources	<ul style="list-style-type: none"> <li>• Corrective and compensatory adjustments</li> <li>• Public education programs</li> </ul>
<b>Recreation, Economic Development, and Tourism</b> (Agencies: NMEDD, NMEMNRD, NMTD)	
Negative effect on tourism from public's negative perception of drought situation in state	<ul style="list-style-type: none"> <li>• NM State Parks (NMSP) diverts fiscal resources to meet needs for public access (e.g., marina relocations)</li> <li>• NMTD proactively market tourism assets that are unaffected by the drought</li> <li>• NMTD collaborate with NM State Parks to market parks</li> <li>• NMTD collaborate with Federal land management agencies (US Forest Service, National Park Service) to market forests, parks, and monuments</li> <li>• Ski Areas, Ski New Mexico, NMTD collectively promote snowmaking capabilities</li> <li>• NMTD work with Regional Marketing Boards to collectively market tourism assets and develop alternative itineraries for visitors</li> </ul>

**TABLE 3. STATE AND FEDERAL AGENCY RESPONSE**

IMPACT CONDITIONS	EMERGENCY RESPONSE ACTIONS
Lack of conservation efforts will further deplete water resources in tourism related businesses	<ul style="list-style-type: none"> <li>• Drinking water be made available only upon request (recommend)</li> <li>• Provide information for emergency low interest loans through the Small Business Administration and other entities</li> </ul>
Revenue effects	<ul style="list-style-type: none"> <li>• Small businesses: loans, tax credits, grant aid programs</li> <li>• Reduced seasonal employment/local economy impacts: special appropriation or contingency funding (develop plan and triggers)</li> <li>• NMSP shortfalls: contingency or emergency funding, fee increases, or budget scale-downs (develop triggers)</li> <li>• Increase access to and availability of such programs as Credit Enhancement and SBA loans</li> <li>• Assist business in accessing alternative energy sources and programs</li> </ul>
Fires in NM State Parks	<ul style="list-style-type: none"> <li>• NMSP offers state parks pre-positioning fire-fighting equipment</li> </ul>

## VIII. MITIGATION ACTIONS

### Mitigation Planning

In addition to planning for triggering emergency responses, mitigation planning helps communities and agencies proactively prepare for the next drought. For example, a mitigation strategy for New Mexico would be enhancing supply through aquifer recharge. Other mitigation strategy examples include demand management through reducing losses, reducing use, and employing economic incentives (IDMP, 2018). The goal of mitigation planning is often defined as supporting communities to become resilient in the face of drought by reducing vulnerabilities to impacts in the underlying social, economic, and environmental systems (Wilhite et al., 2014).

These strategies have been identified as critical nationally (and internationally) in drought planning (Wilhite et al., 2014). The Federal Emergency Management Agency (FEMA) defines hazard mitigation to be “sustained action to reduce or eliminate long-term risk to human life and property from hazards,” and identifies mitigation planning as the “only phase of emergency management specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage” (FEMA, 2018; Williams and Kenney, 2017). In a commissioned study entitled “FEMA Mitigation Support for Planning and Implementation of Climate Resilient Infrastructure,” over 70 “climate resilient” project options were identified, and four were chosen as the top scoring options for further study. These project options have significant relevance for New Mexico. They include Aquifer Storage and Recovery (ASR); Floodwater Diversion and Storage; Floodplain and Stream Restoration; and Low Impact Development (LID)/Green Infrastructure (GI) (FEMA, 2017). New Mexico state agencies are a significant source of support in seeking federal funds for such mitigation projects. The New Mexico Department of Homeland Security and Emergency Management (NMDHSEM) grant program is an example of state agency funding efforts made in New Mexico.

[New Mexico’s State and Regional Water Plans](#) incorporate strategies that can be employed to help mitigate drought vulnerabilities. The [2018 New Mexico State Water Plan](#) Part II Technical Report identifies a need to invest \$10,350,000 in drought mitigation projects. These projects are described as including “shortage sharing agreements, emergency drought restrictions for public water supplies, drilling back-up wells, conjunctive use strategies to rest the aquifer and rely on renewables when available...” and “water banking rather than a permanent transfer of water rights to address the temporary shortage.” The DTF has previously identified the

NMOSE’s Active Water Resource Management (AWRM) and shortage-sharing agreements as important tools for mitigating drought.

NMDHSEM recently released the [State of New Mexico Hazard Mitigation Plan 2018](#) (NMHMP) in which drought impacts are included in the most highly ranked mitigation actions. The top ten (of 42) are included in Table 4 below, and as the plan states, “It is interesting to note that nine of the top ten mitigation actions involve watershed treatment, wildfire risk reduction, or enhanced water supply. The intensified drought-wildfire-flood cycle that we have witnessed in New Mexico has influenced this ranking outcome.”

Table 4. Top ten mitigation actions from the NMHMP

Prioritization Rank	Mitigation Action
1	Increase Number of Firewise/Fire Adapted Communities
2	Study Impact of Post-Fire Flooding/Debris Flow
3	Water Supply/Drought Vulnerability Assessment
4	Public Education/Outreach
5	Improve Forest/Watershed Health
6	Defensible Space Around State Facilities
7	Reduce Combustible Fuel Around Critical Facilities
8	Centralized Hazard Mapping
9	Drought Mitigation in Range Plans
10	Increase Number of CWPPs [Community Wildfire Protection Plans]



Each individual New Mexico state agency generally also has action and priority plans in place. Communities or organizations can approach an agency for assistance in addressing relevant issues, and exchange information on impacts and priority projects. The DTF may consider examining the funding sources available to our communities, municipalities, irrigation districts, and acequias for water projects as a method of insulating our state from future drought.


**Mitigation Action Summary Table**

Table 5 provides a summary of the overall state agency and DTF mitigation action approaches, and is summarized from the detailed tables provided by DTF members and state agencies. These detailed tables are provided in full in Appendix C-Impact, Response, and Mitigation Actions Tables. A related summary table of response actions is included in Section VII-Response Actions.


Table 5. Mitigation Action Summary Table

(Appendix C is source for all information except as noted)

<b>TABLE 5. MITIGATION ACTION SUMMARY TABLE</b>	
<b>IMPACT CONDITIONS</b>	<b>MITIGATION PLANNING AND RECOMMENDED ACTIONS</b>
 <b>Agriculture</b>	
<b>Economic</b>	
<i>Agencies: FSA, NMDA, NMSU CES</i>	
<b>Crops:</b> Production losses; yield decreases, increased infrastructure costs <b>Livestock:</b> Production losses; decreases in stocking, weight, weaning, conception; increased production costs; tax liabilities; decreased county tax roles <b>Dairy:</b> Hay price, production, and freight cost increases	<ul style="list-style-type: none"> <li>• USDA funding</li> <li>• Insurance</li> <li>• NMSU CES technical assistance</li> <li>• NMDA hay sourcing lists maintained</li> </ul>
<b>Management</b>	
<i>Agency: NMDA</i>	
<b>Crops:</b> Crop choices and rotation patterns; soil salinity <b>Livestock:</b> Drought planning in range management plans; reduced forage production; range degradation; livestock distribution challenges <b>Dairy:</b> Decreased milk production	<ul style="list-style-type: none"> <li>• Overall Management: Climate Monitoring Tools</li> <li>• U.S. Drought Monitor (input provided)</li> <li>• USDA National Agricultural Statistics Service New Mexico Weekly Weather and Crop Bulletin</li> <li>• Departure from average NDVI</li> <li>• VegDRI (provides regional to sub-county scale information about drought's effects on vegetation)</li> <li>• Long range climate conditions monitoring</li> <li>• NMDA range management plans technical assistance</li> </ul>
<b>Natural Resources</b>	
<i>Agencies: NMDA, SWCD, NMLB</i>	
Decreased forage production, watershed health; increased erosion; fire destruction; invasive species establishment	<ul style="list-style-type: none"> <li>• SWCD coordination to develop locally driven solutions</li> <li>• Cooperative Weed Management</li> <li>• NMDA coordination of EOC and developing an agricultural component into each County's EOP</li> </ul>
 <b>Drinking Water</b>	
<i>Agencies: NMED, NMDOH, NMDHSEM, NMOSE</i>	
<b>Public Water Systems</b>	
<b>PWS drought-induced operation system failures</b> (State emergency declaration required for PWS to receive emergency funding)	<ul style="list-style-type: none"> <li>• Develop Emergency Fact Sheet</li> <li>• Well maintenance education outreach strategy</li> <li>• Single source / highly vulnerable PWS identified – keep updated (add all Ogallala PWS)</li> <li>• PWS required to develop Operations Management Plan (OMP) and Emergency Response Plan (ERP): templates available</li> <li>• NMED Sustainable Water Infrastructure Teams work to build PWS financial, managerial, and technical capacity</li> </ul>
<b>PWS OMP</b>	<ul style="list-style-type: none"> <li>• Addressed in PWS OMP: well levels, water rates, storage capacity, and delivery mechanisms</li> </ul>
<b>Rate structures and water supply sources</b>	<ul style="list-style-type: none"> <li>• NMED DWB suggests implementation of tiered pricing structure and encourages PWS to develop multiple, diverse water supply sources</li> </ul>


<b>TABLE 5. MITIGATION ACTION SUMMARY TABLE</b>	
<b>IMPACT CONDITIONS</b>	<b>MITIGATION PLANNING AND RECOMMENDED ACTIONS</b>
<b>Water conservation</b>	<ul style="list-style-type: none"> <li>• NMED recommends PWS develop water conservation plans</li> <li>• Promote USEPA WaterSense activities and USEPA subsidies</li> <li>• City rebate programs</li> </ul>
<b>Surface and Ground Water Quality</b>	
<b>LRG salinity increases</b>	<ul style="list-style-type: none"> <li>• Funding and implementation of work plan for targeted projects</li> <li>• Congressional support for federal funds</li> <li>• Feasibility studies for salinity capture and treatment</li> <li>• Existing programs: LRG long-term monitoring program (USGS); Rio Grande Salinity Management Coalition; Geospatial salinity database; USGS Rio Grande Salinity Assessment Study; Rio Grande Economic Impact Assessment study</li> </ul>
<b>Surface water quality sampling</b>	<ul style="list-style-type: none"> <li>• Continue two-year rotational surveys, adjust as needed</li> </ul>
<b>Public Health Impacts</b>	
<b>Increased PWS contaminant levels</b>	<ul style="list-style-type: none"> <li>• Continue partner cooperation required for potable water haulers to be approved and inspected by NMED DWB</li> <li>• NMED DWB and PWS require installation of treatment</li> </ul>
<b>Risk of private wells running dry</b>	<ul style="list-style-type: none"> <li>• Provide technical assistance to communities on private well water issues</li> <li>• Propose to develop drought resource for public health professionals</li> </ul>
 <b>Water Quantity</b>	
<i>Agency: NMOSE (Source: 2008 DTF Recommendations)</i>	
<b>Water development planning</b>	<ul style="list-style-type: none"> <li>• Support efforts mandated by HM 42 (2007)</li> </ul>
<b>Conservation technology</b>	<ul style="list-style-type: none"> <li>• Continue to provide technical assistance (leak detection and audit training programs)</li> </ul>
<b>Conservation benchmarks and goals</b>	<ul style="list-style-type: none"> <li>• Continue to promote best practices in local communities</li> <li>• Lead efforts to create efficiency guidelines</li> </ul>
<b>Conservation promotion</b>	<ul style="list-style-type: none"> <li>• Continue developing public and private partnerships</li> </ul>
<b>Conservation education / outreach</b>	<ul style="list-style-type: none"> <li>• Continue to expand in schools and with general public</li> </ul>
<b>Conservation incentives</b>	<ul style="list-style-type: none"> <li>• Consider new initiative for tax incentives</li> </ul>
<b>New conservation programs</b>	<ul style="list-style-type: none"> <li>• Consider new initiative to study and recommend</li> </ul>
<b>Conservation reporting</b>	<ul style="list-style-type: none"> <li>• Consider new initiative to report and share local savings</li> </ul>
<b>General outreach</b>	<ul style="list-style-type: none"> <li>• Consider new initiative for "Living with Drought" website</li> </ul>
<i>Agency: NMISC (Source: 2008 DTF Recommendations)</i>	
<b>Regional water planning</b>	<ul style="list-style-type: none"> <li>• Support planning process</li> </ul>
<b>Acequias</b>	<ul style="list-style-type: none"> <li>• Support Acequia Rehabilitation Program</li> </ul>
<b>Metering</b>	<ul style="list-style-type: none"> <li>• Support Metering Re-loan Program</li> </ul>
<b>Middle Rio Grande (MRG)</b>	<ul style="list-style-type: none"> <li>• Support MRG ESA River Operations Optimization</li> <li>• Continue the operation of the Water Management Decision Support System for MRG Conservancy District</li> </ul>
<b>Elephant Butte Pilot Channel</b>	<ul style="list-style-type: none"> <li>• Maintain efforts to keep open</li> </ul>
<i>Agencies: NMOSE, NMISC (Source: 2008 DTF Recommendations)</i>	
<b>Canadian River Basin: compact, decree</b>	<ul style="list-style-type: none"> <li>• Secure storage rights</li> </ul>
<i>Agencies: NMOSE, NMISC (unless otherwise noted)</i>	
<b>Colorado River Basin</b>	

<b>TABLE 5. MITIGATION ACTION SUMMARY TABLE</b>	
<b>IMPACT CONDITIONS</b>	<b>MITIGATION PLANNING AND RECOMMENDED ACTIONS</b>
<b>Colorado River and Upper Colorado River Basin Compacts</b> <ul style="list-style-type: none"> <li>• La Plata, Animas, and San Juan effects</li> <li>• Water competition between endangered species and tribal, federal, and state uses</li> <li>• Impact to San Juan–Chama deliveries</li> <li>• Potential Compact compliance call</li> </ul>	<ul style="list-style-type: none"> <li>• San Juan Basin AWRM</li> <li>• Upper Colorado River Basin Drought Contingency Plan (UCRC/Reclamation/NMISC)</li> <li>• Maintain system for assessment and coordination if Navajo Reservoir will drop below intake for Navajo Indian Irrigation Project</li> </ul>
<b>Lower Colorado River Basin Court Decrees</b> <ul style="list-style-type: none"> <li>• NM use limited due to reduced Gila River Basin flows</li> </ul>	<ul style="list-style-type: none"> <li>• Administrative Controls on proposed new uses (NMOSE)</li> <li>• NM Unit of AWSA (NM CAP Entity/NMISC/Reclamation Local political subdivisions/NMISC)</li> <li>• Non-Unit AWSA projects</li> </ul>
<b>Animas La Plata Project Compact</b>  <b>Operating Plan for Colorado River Reservoirs</b>	<ul style="list-style-type: none"> <li>• Coordinate on proposed plans for ALP Operations for delivery within NM</li> <li>• Coordinate on approved ALP operations for NM users</li> <li>• (Agencies: <ul style="list-style-type: none"> <li>◦ SJWC coordination with ALP Operating entity</li> <li>◦ SJWC/NMISC Proposal to NMOSE for routing within NM</li> <li>◦ SJWC enforcement actions of Colorado ALP settlement.</li> <li>◦ NMISC engagement with Colorado, if and as needed)</li> </ul> </li> <li>• San Juan River Recovery Implementation Program (Basin Stakeholders / NMDGF / NMISC / Reclamation / FWS)</li> <li>• Drought Contingency Plans and Upper Basin Drought Response Operations Agreement (DOI/7-Basin States/Mexico/UCRC)</li> </ul>
<b>Colorado River Salinity Title II, Public Law 93-320, Amended</b> <ul style="list-style-type: none"> <li>• Negatively impact desired salinity levels</li> </ul> <b>Gila River Allocation</b> Consumptive use negatively impacted (without injury to downstream users)	<ul style="list-style-type: none"> <li>• Proactively Engage in Colorado River Salinity Control Program (Salinity Control Forum and Advisory Council/7-Basin States/NMISC)</li> </ul>
<b>New Mexico's 14,000 Acre-Foot Gila River Allocation</b> <ul style="list-style-type: none"> <li>• Consumptive use negatively impacted by drought</li> </ul>	<ul style="list-style-type: none"> <li>• New Mexico Unit of the Central Arizona Project EIS</li> </ul>
<b>Pecos River Basin</b>	
<b>Pecos River Basin Compact:</b> <ul style="list-style-type: none"> <li>• NM delivery obligation impacts</li> <li>• Increased likelihood of groundwater pumping</li> <li>• Negatively impacted ESA flow requirements</li> </ul>	<ul style="list-style-type: none"> <li>• Pursue possible additional water rights purchases</li> <li>• Prepare for possible NMISC pumping to augment CID supply</li> <li>• Continue to monitor ESA flows</li> </ul>
<b>Rio Grande Basin</b>	
<b>Amended Costilla Creek Compact</b> <ul style="list-style-type: none"> <li>• Both states supply availability impaired</li> </ul>	<ul style="list-style-type: none"> <li>• Continue NM water master administration to ensure compliance with compact delivery requirements</li> </ul>

<b>TABLE 5. MITIGATION ACTION SUMMARY TABLE</b>	
<b>IMPACT CONDITIONS</b>	<b>MITIGATION PLANNING AND RECOMMENDED ACTIONS</b>
<b>Rio Grande Compact impacts</b> <ul style="list-style-type: none"> <li>• San Juan–Chama Project – NM user quantity reduction</li> <li>• Above Otowi Gage depletions restricted to 1929 levels – no impacts</li> <li>• Below Otowi Gage NM delivery obligation for 50% of flow to below Elephant Butte (EB) Reservoir – decrease to NM’s ability to deliver; conveyance losses, increased losses due to endangered species and non-native habitat</li> <li>• Below EB, Project storage is greatly affected by drought; volume of project storage impacts the ability to store water in upstream reservoirs and water availability to downstream NM irrigators</li> </ul>	<ul style="list-style-type: none"> <li>• Assess monitoring effort to identify SJC project allocation triggers</li> <li>• Monitor native water diversions to protect SJC water contracted to downstream users</li> <li>• Monitor cumulative credits and debits for risk of excess of allowable</li> <li>• Continue support pilot channel maintenance for credit water delivery and monitor activities that may increase depletions and negatively impact Compact deliveries</li> <li>• Continue to engage with ESA process, ESA commitments required in the 2016 Biological Opinion, while protecting water users</li> <li>• Continue to monitor reservoir inflows, storage, and outflows and pursue resolution to litigation</li> </ul>
<b>Statewide</b>	
<b>Acequias:</b> Surface water supply impairment	<ul style="list-style-type: none"> <li>• Encourage shortage sharing agreements between acequias sharing supply from same source</li> </ul>
<b>Non-stream connected groundwater:</b> Groundwater mining acceleration	<ul style="list-style-type: none"> <li>• Monitor groundwater levels and encourage conservation if needed</li> </ul>
 <b>Wildlife</b>	
<i>Agency: NMDGF</i>	
<b>Need for drought-related environmental impact assessment</b>	<ul style="list-style-type: none"> <li>• <b>Assessment topics/contents:</b> Identify baseline conditions and major potential impacts; Evaluate findings and alternatives</li> <li>• <b>Evaluation criteria for success:</b> speed, reliability, cost efficiency</li> <li>• <b>Regional management plans:</b> Summarize findings</li> </ul>
<b>Reduced streamflow effect on threatened and endangered (T and E) species - aquatic plants and animals</b>	<ul style="list-style-type: none"> <li>• <b>Develop prioritized list:</b> possible drought affected habitats</li> <li>• <b>Develop plans and briefing to governor on T and E species obligations:</b> alternatives for sustaining existing habitat and/or instream flows; emergency habitats</li> <li>• <b>Initiate partnerships with local water users and regulatory agencies:</b> for priority areas; develop emergency alternatives to instream flow manipulation</li> </ul>
<b>Diminished fishing opportunities</b>	<ul style="list-style-type: none"> <li>• <b>Develop alternatives to emergency surface water transfers:</b> in partnership with major water users</li> </ul>
<b>Fish and wildlife-based private enterprise income reduction</b>	<ul style="list-style-type: none"> <li>• <b>Economic analysis by climatic regions:</b> assist developing 25%, 50%, 75% hunting and fishing opportunity reductions</li> <li>• <b>Provide enterprise stabilization training:</b> emphasize drought contingency planning</li> </ul>
<b>Critically low flows disrupting continuity of aquatic habitat – Altered ecological function due to habitat simplification and fragmentation</b>	<ul style="list-style-type: none"> <li>• <b>Assess existing alternative approaches for the establishment of instream flows to sustain aquatic life forms:</b> applicability to different NM impaired and vulnerable locations and situations</li> <li>• <b>Assess alternatives for instream flow with local water users:</b> initiate discussions in priority areas</li> </ul>



<b>TABLE 5. MITIGATION ACTION SUMMARY TABLE</b>	
<b>IMPACT CONDITIONS</b>	<b>MITIGATION PLANNING AND RECOMMENDED ACTIONS</b>
<p><b>Big game and waterfowl species</b> – Reduced reproductive and survival rates, and increased mortality rates; wildlife and land use competition of resources; reduction of available wildlife; drinking water and food supply; induced wildlife migration</p>	<ul style="list-style-type: none"> <li>• <b>Examine alternatives for reducing competitive land uses</b></li> <li>• <b>Forage resource damage concerns:</b> consider careful reduction of big game species populations</li> <li>• <b>Waterfowl preserves vulnerable to feedstock reductions:</b> develop priority lists, feeding alternatives</li> <li>• <b>NMDGF wildlife depredation program:</b> emphasize public education addressing wildlife survival and hunting restrictions</li> <li>• <b>Alternative hunting seasons:</b> determine impact on the compensatory response of drought-affected populations</li> </ul>
<p><b>Fish and fishery productivity</b> – Fish habitat deterioration; Insufficient water for hatchery production; Fishery management program effects</p>	<ul style="list-style-type: none"> <li>• <b>Temporarily curtail fish stocking programs:</b> if necessary, where stocked fish habitat conditions become unsuitable</li> <li>• <b>Curtail hatchery production and reallocate fish inventory to alternative recreational fishing sites:</b> if necessary</li> <li>• <b>Re-engineer hatchery water delivery systems:</b> provide technical solutions to possible water quality problems</li> </ul>
<p><b>Loss or impairment of fish and wildlife resources</b> – Fragmented ecosystems and animal populations; altered ecosystem functions and energy pathways; Reduced productivity</p>	<ul style="list-style-type: none"> <li>• <b>Corrective and compensatory adjustments:</b> implement through fishing/hunting regulations</li> <li>• <b>Conduct public education programs</b></li> </ul>
<p><b>Unfavorable public opinion and public concern</b> – Fish/wildlife conservation/preservation; Environmental protection</p>	<ul style="list-style-type: none"> <li>• <b>Enhance sport-fishing opportunities</b> by stocking hatchery-produced fish where habitat conditions permit</li> <li>• <b>Employ aquaculture</b> to secure and enhance the status of non-game species of fish including endangered species</li> </ul>
<p><b>Post drought recovery</b> – summary mitigation actions</p>	<p>In a "normal" year, plan for:</p> <ul style="list-style-type: none"> <li>• <b>Flow still below normal:</b> Coordination needed to protect endangered species and utilize hatcheries in Pecos and Rio Grande</li> <li>• <b>Recreational fishing:</b> limit or eliminate opportunities</li> <li>• <b>Human/wildlife interactions and depredation / reduced game animal populations and habitat:</b> adjustments to allowable hunting</li> </ul>
<p><b>Multiplied effects from multiple years of drought</b> – summary mitigation actions</p>	<p>In a drought year similar to 2003, plan for:</p> <ul style="list-style-type: none"> <li>• <b>Increased depredation:</b> especially from bear, elk and deer</li> <li>• <b>Increased supplemental feeding for migratory waterfowl</b></li> <li>• <b>Increased endangered species impacts and divisive issues:</b> exacerbated by increased Rio Grande restrictions; litigation effects</li> <li>• <b>Bear, elk and deer populations:</b> greatly reduced but viable</li> </ul>
 <b>Wildland Fire and Watersheds</b>	
<b><i>Monitoring and Assessing Fire Danger Conditions</i></b>	
<p><i>Agencies: SWCC, USFS, USBLM, USBIA, USFWS, USNPS, NMEMNRD</i></p>	
<p><b>Increased fire</b> - danger, intensity, and longer fire season beyond fire suppression capabilities <b>Need for fire danger and climate data</b> - action planning</p>	<p><b>Wildland Fire</b></p> <ul style="list-style-type: none"> <li>• Monitor fire danger conditions in the field.</li> <li>• Coordinate collection and analysis of fire season data at the Southwest Coordination Center (SWCC)</li> <li>• Utilize the SWCC Energy Release Component (ERC) chart to compare yearly fire danger potential, disseminate data</li> <li>• In assessing fire danger conditions, expect and plan for an earlier, longer, and more intense fire season</li> </ul>
<p><b><i>Fire Management Activities</i></b></p>	

<b>TABLE 5. MITIGATION ACTION SUMMARY TABLE</b>	
<b>IMPACT CONDITIONS</b>	<b>MITIGATION PLANNING AND RECOMMENDED ACTIONS</b>
<p><b>Increased fire danger</b> - results in more fires, intensity, rapid spread, acres burned, control difficulty, and forest vulnerability from insect damage</p> <p><b>Increased threats</b> - firefighters, public safety, longer community evacuations</p> <p><b>Fire suppression</b> - costs and needs could reach record levels and exceed resources</p>	<ul style="list-style-type: none"> <li>• <b>Fire Prevention:</b> Media campaign; Coordinated agency fire restrictions and closures in public lands; Utilize law enforcement and multi-agency task force to encourage responsible stewardship by citizens; Implement local government ordinances for defensible spaces in new developments and construction standards.</li> <li>• <b>Fire Pre-Suppression:</b> Increase training and promotion of training; Grants to fire departments; Statewide mobilization of firefighting resources (develop)</li> <li>• <b>Fire Suppression:</b> Prioritize public and firefighter safety first; Type III org.'s for each Interagency Zone Dispatch area for initial attack efforts (continue to develop)</li> </ul>
<b><i>Fires Threatening Communities</i></b>	
<i>Agencies: NMEMNRD, NMDPS, DHSEM, USBLM, USFS</i>	
<p><b>Increased probability of catastrophic fires in watersheds and communities</b></p>	<ul style="list-style-type: none"> <li>• <b>Prioritize Fire Incidents</b> – see Response chart</li> <li>• <b>Coordinate Evacuations</b> – see Response chart</li> <li>• <b>Fuels Reduction Treatments</b> – implement the New Mexico Fire Plan and National Cohesive Wildland Fire Strategy and design projects collaboratively; community leadership is very important</li> <li>• <b>Monitor and evaluate</b> – transmit lessons learned from projects to land managers. Coordinate with research institutions and organizations.</li> <li>• <b>New Mexico Fire Planning Task Force (NMFPTF)</b> – hosted by NMEMNRD Forestry Division, reviews priority at-risk communities, develops model ordinances and building codes, and provides recommendations to the governor by Dec. 15 each year</li> <li>• <b>Conservation Easements to Reduce Development in Forest Lands</b> - in high-risk communities threatened by development (continue to implement)</li> </ul>
<b><i>Forest and Watershed Health</i></b>	
<p><b>Forest and watershed health</b> - declines due to susceptibility to insects and disease and destructive wildfires</p> <p><b>Increased mortality, disrupted projects</b> - due to high fire danger, tree seedling sale reductions from water availability concerns</p> <p><b>Implementation processes and procedures</b> - slowing of forest and watershed restoration projects on National Forest lands and exacerbation of the situation</p>	<ul style="list-style-type: none"> <li>• <b>New Mexico Forest and Watershed Health Plan and the New Mexico Statewide Natural Resources Assessment and Strategy and Response Plans</b> – Reintroduction of normal fire occurrence cycle into the ecosystem</li> <li>• <b>Surveys</b> – identify location and extent of insect and disease outbreaks</li> <li>• <b>Forest insect and disease management</b></li> <li>• <b>Smoke Management Program Rules (SMPR)</b> – update</li> <li>• State's Nonpoint Source Management Plan</li> <li>• <b>Fund post-fire actions</b> – (NMED SWQB through CWA 319)</li> <li>• <b>Promote sound policy and streamlined review and implementation processes</b></li> <li>• <b>Promote community-based projects</b> - gain public support for local forest restoration projects</li> <li>• <b>Reduce treatment costs</b></li> <li>• <b>Strengthen the economies of rural forest-based communities</b></li> </ul>
<b><i>Threatened and Endangered Plant Species</i></b>	
<p><b>Endangered plants and sensitive areas</b> - reduced reproductive and survival rates and increased mortality rates, exacerbated herbivory, trampling, predation, and erosion effects</p>	<p><b>Monitor rare and vulnerable plant populations and take action upon impacts identified</b> - consider fencing in sensitive areas; trapping rodents; regular endangered plant seed collection; increase awareness of endangered plant habitats by working with state and federal fire agencies to minimize or avoid impacts of fire management activities</p>
<b><i>Air Quality Issues</i></b>	
<p><b>Smoke impacts from fires</b></p>	<ul style="list-style-type: none"> <li>• <b>Smoke Management Program Rules</b></li> <li>• <b>Public notified of potential smoke impacts from wildfires</b></li> </ul>
 <b>Economics, Tourism, Recreation</b>	

<b>TABLE 5. MITIGATION ACTION SUMMARY TABLE</b>	
<b>IMPACT CONDITIONS</b>	<b>MITIGATION PLANNING AND RECOMMENDED ACTIONS</b>
<b>Marketing</b>	
<i>Agencies: NMDOT, NMEMNRD, NMDFA, NMLFC, USBOR, USACE, Irrigation Districts, NMSP, NMDGF, NMDHSEM, NMEDD</i>	
<p><b>Negative effect on tourism from public's negative perception of drought situation in state</b></p> <p><b>Negative effect on ability to recruit new businesses to New Mexico</b></p>	<ul style="list-style-type: none"> <li>• <b>Regression analysis on the potential drought and wildfires effects on NM tourism:</b> provided to policy makers and industry upon completion</li> <li>• NMTD proactively market tourism assets that are unaffected by the drought via: <ul style="list-style-type: none"> <li>○ Newmexico.org</li> <li>○ Social media channels</li> <li>○ Out of home ad placements</li> <li>○ Visitor information centers</li> <li>○ Other media channels</li> </ul> </li> <li>• NMTD collaborate with NMSP to market parks <ul style="list-style-type: none"> <li>○ Promote parks that are unaffected by drought</li> </ul> </li> <li>• NMTD collaborate with federal land management agencies (USFS, USNPS) to market forests, parks, and monuments <ul style="list-style-type: none"> <li>○ Promote forests, parks, monuments that are unaffected by drought</li> </ul> </li> <li>• Ski areas, Ski New Mexico, NMTD collectively promote snowmaking capabilities <ul style="list-style-type: none"> <li>○ Provide and promote alternative winter recreation activities at ski areas</li> </ul> </li> <li>• NMTD work with Regional Marketing Boards to collectively market tourism assets and develop alternative itineraries for visitors</li> <li>• NMTD collect visitation data at visitor information centers</li> <li>• <b>Communication and coordination:</b> <ul style="list-style-type: none"> <li>○ Advance notification of reservoir water releases</li> <li>○ Conservation technical assistance to tourism related businesses – NMTD to work with NMOSE and NMED</li> </ul> </li> </ul>
<b>Conservation</b>	
<p><b>Lack of conservation efforts will further deplete water resources in tourism related businesses</b></p>	<p>Promote, recommend and/or mandate conservation:</p> <ul style="list-style-type: none"> <li>• <b>All industries:</b> alternative landscaping, tax credits for efficient fixtures and appliances</li> <li>• <b>Hotels/Resorts additionally:</b> multi-day linen use, gray water reuse, pool maintenance / water reuse</li> <li>• <b>Restaurants additionally:</b> drinking water available only upon request, paper coverings to limit linen wash, disposable tableware available as an option</li> <li>• <b>Recreation small businesses additionally:</b> public land / water-use permit credits to allow businesses in affected areas (rafting companies, concessionaires, etc.) to recoup costs, low interest loan information, marketing grants when drought period is over, Small Business Development Centers provide free consultation / assistance on business adaptation / diversification</li> </ul>
<b>Recreation</b>	
<p><b>Skiing industry effects</b></p>	<ul style="list-style-type: none"> <li>• <b>Snow-making capability:</b> Ski areas encouraged to purchase, use, and develop advertising</li> </ul>
<p><b>Revenue effects</b></p>	<ul style="list-style-type: none"> <li>• <b>Assist business and small businesses:</b> loans, tax credits, grant aid programs</li> <li>• <b>Reduced seasonal employment/local economy impacts:</b> special appropriation or contingency funding (develop plan and triggers)</li> <li>• <b>State Parks shortfalls:</b> contingency or emergency funding, fee increases, or budget scale-downs (develop triggers)</li> </ul>
<p><b>Reduced lake levels have had a significant impact on recreational use.</b></p>	<ul style="list-style-type: none"> <li>• <b>Drought Response Action Plan (DRAP)</b> - NMSP currently developing</li> <li>• <b>NMSP public access:</b> diverts fiscal resources to meet (e.g., marina relocations)</li> </ul>

TABLE 5. MITIGATION ACTION SUMMARY TABLE	
IMPACT CONDITIONS	MITIGATION PLANNING AND RECOMMENDED ACTIONS
<b>Drought Monitoring Work Group</b>	
<i>(Source: 2006 Drought Plan)</i>	
<b>National:</b> Need for coordinated monitoring	<ul style="list-style-type: none"> <li>• NIDIS enactment with Western Governors Association</li> </ul>
<b>Arizona:</b> Need for more consistent monitoring between New Mexico and Arizona	<ul style="list-style-type: none"> <li>• Coordinate with the Arizona drought monitoring committee</li> </ul>
<b>New Mexico:</b> Need for funding for comprehensive drought monitoring plan for the state; need for impacts information on spatial scales	<ul style="list-style-type: none"> <li>• Additional monitoring equipment and better statistical tools</li> </ul>
<b>Water Infrastructure Technical Team</b>	
<i>(Source: 2006 Drought Plan)</i>	
<b>Implemented water projects:</b> Need for hydrological and fiscal sustainability and Safe Drinking Water Act compliance	<ul style="list-style-type: none"> <li>• State policy development</li> </ul>
<b>Planning:</b> Need to help public water systems with planning as necessary; need to simplify and direct statutes; need for tie between development and assured water supply	<ul style="list-style-type: none"> <li>• Create handbook "Navigating the Waters"</li> <li>• One statute for OSE plans and conservation issues</li> </ul>
<b>Conservation water quantity and quality:</b> Water supply and quality	<ul style="list-style-type: none"> <li>• Develop conservation plan</li> <li>• Xeric landscaping model code</li> <li>• Source Water Protection package</li> </ul>
<i>(Source: 2008 DTF Recommendations)</i>	
<p><b>Future New Mexico drought planning organizational structure</b></p> <p>The State agencies to the right were part of the 2006 and 2008 DTF recommendations</p>	<p><b>DTF to recommend if this multi-agency approach is desired and which previous recommendations are to be retained</b></p> <ul style="list-style-type: none"> <li>• New Mexico Finance Authority</li> <li>• Energy, Minerals and Natural Resources Department <ul style="list-style-type: none"> <li>○ Mining and Minerals Division</li> <li>○ Oil Conservation Division</li> <li>○ State Parks Division</li> <li>○ State Forestry Division</li> </ul> </li> <li>• Energy Conservation and Management Division</li> <li>• Youth Conservation Corps</li> <li>• Indian Affairs Department</li> <li>• Department of Finance and Administration</li> <li>• Economic Development Department</li> <li>• New Mexico Environment Department <ul style="list-style-type: none"> <li>○ Drinking Water Bureau</li> <li>○ Surface Water Quality Bureau</li> <li>○ Air Quality Bureau</li> </ul> </li> </ul>

## IX. DROUGHT PLAN UPDATE PROCESS

There are not any previously established guidelines for drought plan content and updates. Moving forward, the drought plan should be updated every five years for the purpose of keeping the document current.

## **X. FUTURE WORK**

The process of updating the Drought Plan identified additional areas where future work could benefit and improve the State's response to drought. Potential areas where future work could be undertaken include, but are not limited to the following:

- development of a communications framework for the DMWG and/or others to communicate issues related to the status of drought with specific water user groups such as municipalities, mutual domestic water consumer associations, state and federal agencies, ranchers, agricultural producers, tribes, and others
- development of a pilot study project to test a communications framework
- study the ongoing drought response processes developed in California and Colorado for applicability in New Mexico
- development of a Drought Monitoring and Water Availability Index specific to different regions within New Mexico that incorporates water availability from reservoirs and potentially groundwater storage
- development of a drought planning stakeholder process
- conduct an assessment of New Mexico drought vulnerabilities (by basin, water user type, public water system, etc.)
- conduct a statewide drought economic impact assessment across all economic sectors
- conduct an assessment of mechanisms for addressing water supply challenges in wildfire and post-wildfire situations; currently these situations are complicated and refinement in the future will be required to better respond to drought related wildfires
- evaluate development of a formal process for monitoring the implementation of mitigation actions
- conduct a study evaluating the usefulness of customizable offshoot models that can be integrated with other water resource models including the New Mexico Dynamic Statewide Water Budget

There is significant potential for future work to enhance New Mexico's response to drought. However, the extent to which additional work can be pursued will depend on the availability of funding and resources, as well as direction from state leadership.

### **Future Work: Tribes, Pueblos, and Nations**

Future work and needs are based on past experience. Tribes, Pueblos, and Nations around the State have responded differently to drought. Some entities, such as the Navajo Nation, have developed their own drought plans, consistent with their sovereign status. Others have varying degrees of formal and ad hoc adaptive approaches for responding to drought. During the 2018 drought, many of these adaptive approaches involved cooperation with non-Indian communities and the State.

Actions included:

- the Pueblo of Jemez implemented irrigation rotation scheduling
- the Pueblo of Zia implemented irrigation rotation scheduling
- non-Indian irrigators above Jemez Pueblo reduced irrigation to a limited period each week

- NMOSE staff met with all parties and implemented irrigation monitoring at the request of the Pueblos
- the Middle Rio Grande Conservancy District (MRGCD) implemented irrigation rotation for non-Pueblo irrigators due to low storage reserves
- non-Pueblo irrigators supplied by the MRGCD water bank were also curtailed
- Pueblo irrigators received full irrigation delivery during the 2018 irrigation season
- the Pueblos of Taos and Picuris both limited irrigation due to lack of supply (ies)
- the Pueblo of Ohkay Owingeh had multiple meetings with NMOSE staff and non-Indian irrigators to address shortages in that area which resulted in shortage sharing of native flow
- the Navajo Nation participated in a drought insurance program through USDA that will be implemented in 2019

Efforts such as these need to be recognized and enhanced through continued cooperation and mutual respect. Improving the adaptive management of this shared resource is critical to future drought response.

An important need moving forward is enhanced coordination and joint response to drought among New Mexico Tribes, Pueblos, Nations, and the State. Although tribal communities are represented by the New Mexico Indian Affairs Department in the DTF, increased coordination with them will improve drought response throughout the State. In addition, it is important to recognize that the special nature of tribal lands and economies can result in particular impacts from drought that differ from those experienced on non-tribal lands. Tribal communities may have a different level of economic resilience to drought.

## XI. REFERENCES

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## **XII. APPENDICES**

### **Appendix A. New Mexico Drought Plan Comparison**



Appendix A. New Mexico Drought Plan Comparison

	New Drought Plan Table of Contents (TOC) The NMDP 2018 used the 2002 original structure and content, and the Drought Working Group subsequently made updates and revisions	2002, v1 TOC sections below are listed to correspond to new drought plan TOC to the left [notes in brackets]	2002, v2 TOC [notes in brackets]	2003 TOC [notes in brackets]	2006 TOC [notes in brackets]	2008 DTF Recommendations TOC [notes in brackets]	2013, IAC Draft Impact Assessment Report TOC [notes in brackets]	2018 updates to previous DTF, ad hoc working group and state agency impact, response and mitigation action tables
I.	Executive Summary	Section 1 - Executive Summary	Tab 1a - Executive Summary	1) Introduction [has background info]	1) Introduction [has background info]		1) Executive Order	
II.	History and Purpose	Section 2 - History / Purpose of New Mexico Drought Plan	Tab 2 - Water Compacts and Related Agreements, Decisions, or Decrees				2) NM State Drought task force	
III.	Definition of drought	Section 3 - Definition of Drought						
IV.	Operational Framework	Section 5 - Structure and Function of Drought Planning [Organizational Chart!]	Tab 1b - Structure and Function of Drought Planning [no changes from v1]	3) Structure of Drought Planning [updated - expands to 6 groups, removed the water trust board and added a water development work group]	3) Organizational Structure of Drought Planning [most revised and is the basis for the new plan]			
		Section 9 - Leadership Plan (Communication and Partnerships)						
		Section 11 - Drought Planning Group Contact Information	Tab 5 - Contact Information [updated]	Appendix A: Drought Task Force Members Appendix B: DTF Work Group Members	Appendix B: Drought Task Force Members Appendix C: Monitoring Work Group Members			
	Section 12 - Available Federal Drought Relief Programs							
V.	Coordinated Drought Monitoring	Section 6 - Drought Monitoring						
VI.	Impact and Vulnerability Assessment	Section 4 - Drought Vulnerability						
VII.	Response Actions	Section 7 - Drought Response and Assessment Section 8 - Implementation Plan	see Mitigation section, actions combined in previous documents	see Mitigation section, actions combined in previous documents	see Mitigation section, actions combined in previous documents		see Mitigation section, actions combined in previous documents	updates provided (full text in Appendix C)
VIII.	Mitigation Actions	Section 10 - Planned Mitigation Actions (Immediate, Interim, Long Term), [superceded by later IAC group reports]	Tab 3 - Policy Recommendations Tab 4 - Sub-Group Action Plans [updated from v1, superceded by later IAC group reports]	4) DTF Work Group Priorities 5) DTF Work Group Ongoing Mitigation Activities [all work groups updated from 2002]	Appendix F: Recommendations From The 4) DTF Work Group Activities and Priorities [Monitoring & Water Infrastructure work groups updated]		3) Impact assessment committees, Drinking	updates provided (full text in Appendix C)
						Some included, and link provided in appendices to full document		
	<b>New sections</b>	<b>Deleted sections</b> (below does not correspond to new TOC on the left)						
IX.	Drought Plan Update Process	Section 13 - Monthly Drought Monitoring Report	Tab 1c - Drought Monitoring Report	Appendix C Comprehensive Statewide Municipal and Industrial Water Conservation Program	2) Drought Conditions Update		Appendix A: Executive Order	
X.	Future Work	Section 14 - NM Water Trust Board Annual Report 1010112002		2) Drought Conditions Update				
XI.	Appendices	Section 15 - Applications						

## **Appendix B. Electronic Supporting Files Directory**

### **Past Drought Plans**

[2002 New Mexico Drought Plan Volume 1](#)

[2002 New Mexico Drought Plan Volume 2](#)

[2003 New Mexico Drought Plan Update: November 2003](#)

[2006 New Mexico Drought Plan Update: December 2006](#)

[2008 Recommendation from the Drought Task Force](#)

[2013 Draft Impact Assessment Committee \(IAC\) Report](#)

### **Executive Orders**

[1998-041](#)

[2002-019](#)

[2003-019](#)

[2006-012](#)

[2009-025](#)

[2012-006](#)

[2018-031](#)

### **Other Relevant State Agency Plans**

[New Mexico State Mitigation Hazard Plan](#)

[2018 New Mexico State Water Plan](#)

### **List of Hyperlinks and Addresses in Document Not Listed Above**

National Weather Service <http://www.weather.gov>

Drought Task Force <http://www.ose.state.nm.us/Drought/taskForce.php>

Drought Monitoring Working Group  
[http://www.ose.state.nm.us/DroughtTaskForce/MonitoringWorkGroup/df\\_workgroup.php](http://www.ose.state.nm.us/DroughtTaskForce/MonitoringWorkGroup/df_workgroup.php)

New Mexico Climatic Center <http://www.weather.gov/abq>

Western Regional Climate Center <https://www.stateclimate.org/wrcc>

USGS <https://nm.water.usgs.gov/drought/>

New Mexico Department of Agriculture <http://www.nmda.nmsu.edu/>

## **Appendix C. Impact, Response, and Mitigation Action Tables**

The Drought Task Force members, DTF Work Groups, and state agencies associated with the impacted sectors provided updates to previous “Impact Assessment summaries.”

The impact sectors identified by the DTF in 2013 are:

- Agriculture
- Wildlife
- Wildland Fire
- Watersheds
- Drinking Water
- Economics
- Tourism
- Recreation

The following sector list from the 2013 Impact Assessment Committee provided specific recommendations for the DTF to consider.

### **Drinking Water**

The initial review of impacts produced a number of items that need further refinement, especially related to public water systems. Generally, the topic areas that require additional discussion are:

- Approve continued work with a sub group of the IAC to discuss Drinking Water Issues
- Assess how best to implement gallon per capita per day (GPCD) metrics
- Leak detection requirements
- Drought Triggers for Emergency Response Plans (ERP) and Operation and Maintenance Plans (OMP)
- Checking on ERP linkage with drought monitoring metrics
- Explore NMDHSEM opportunities for FEMA funding for statewide model conservation ordinance
- Review Conservation and Drought Sections of State Water Plan
- Work on understanding opportunities for Peak Demand Reductions, specifically in drought situations
- Develop and implement community outreach and education programs regarding water use, water conservation, and drought

It is recommended that a sub-committee of representatives from NMED, NMOSE, and NMDHSEM meet to further discuss the topics.

### **Wildland Fire and Watersheds**

The activities related to wildland fire are well known amongst those in the field and have been ongoing for many years. The following recommendations are a first cut at the most pressing actions known at this time.

- Ability to respond quickly to known hazards within watersheds can be limited by federal requirements (NEPA, etc.). Understanding it is a complex issue, assess potential opportunities to improve this process.
- Expedite communication synchronization between various local, state and federal agencies
- Continue/increase support for mitigation activities that protect watersheds and communities
- Smoke management rule. Rule changes may ease open burning to assist in implementing prescribed burns and improve coordination with State/Fed interaction. Work with NMDOH to continue risk communication regarding smoke exposure.
- Investigate opportunities to assist communities to prepare and respond to post-fire impacts including flooding and degraded water quality.

### **Impact, Response, and Mitigation Action Impact Assessment Committee Detail Tables**

Table C-1 summarizes the original detailed content from the DTF, DTF work groups, and state agencies, reformatted for clarity and adding a column (far right) with a designation indicating whether the action is an emergency response (R) or a mitigation (M) action. This designation provides a link between the original content and the summary charts included in Section VII-Response Actions and Section VIII-Mitigation actions.

Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions

<b>Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions</b>		
<b>Impacts</b>	<b>[Emergency and Mitigation] Response and Proposed Actions / Current Status</b>	<b>R or M</b>

**WATER QUANTITY**

Source: 2018 update to 2013 IAC Report

<b>Agencies: NMOSE, NMISC (unless otherwise noted)</b>		
<b>Canadian River Basin</b>		
<p><b>1. Canadian River Compact and Decree in Oklahoma and Texas v. New Mexico (Ute Dam and Reservoir)</b></p> <p>a. Drought will not inhibit ability of New Mexico to exercise its rights to store Canadian Basin waters</p>	<p>1. No response identified</p>	
<b>Colorado River Basin</b>		
<p><b>1. Colorado River and Upper Colorado River Basin Compacts</b></p> <p>a. Drought has had a significant effect on the La Plata and Animas Rivers and will on the San Juan River below Navajo Reservoir in the future</p> <p>b. Water for Endangered Species will compete with tribal, federal, and state uses</p> <p>c. Drought shortages have impacted deliveries of San Juan Chama water to the Jicarilla Nation, cities and irrigation districts in Rio Grande Basin</p> <p>d. A Compact compliance call, while a remote probability, could reduce supplies to water users with rights junior to 1922 even if river flows are not low</p>	<p>1. San Juan Basin AWRM (NMOSE)</p> <p>2. Voluntary rotation among ditches and for cities along the Animas River (ditches / cities / NMOSE)</p> <p>3. Coordinate on proposed plans for ALP Operations for delivery within NM (San Juan Water Commission (SJWC) / NMISC proposal to NMOSE)</p> <p>4. Upper Colorado River Basin Drought Contingency Plan (UCRC/Reclamation/NMISC)</p> <p>5. Maintain system for assessment and coordination if Navajo Reservoir will drop below intake for Navajo Indian Irrigation Project (Reclamation)</p>	<p><b>M</b></p> <p><b>R</b></p> <p><b>R</b></p> <p><b>M</b></p> <p><b>R/M</b></p>
<p><b>2. Lower Colorado River Basin Court Decrees</b></p> <p>a. 1964 Supreme Court decree in Arizona v. California set forth New Mexico's water rights for Gila River basin in New Mexico (San Simon Creek, San Francisco River, Gila River, and all tributaries and related groundwater sources)</p> <p>i. In expected drought situations, New Mexico water users will be limited in proportion to reduced Gila River Basin flows</p>	<p>1. Administrative Controls on proposed new uses (NMOSE)</p> <p>2. NM Unit of AWSA (NM CAP Entity/NMISC/Reclamation Local political subdivisions/NMISC)</p> <p>3. Non-Unit AWSA projects</p>	<p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p>
<p><b>3. La Plata River Compact</b></p> <p>a. Drought has and will severely impact availability of water for New Mexico users in proportion to reduction in La Plata flows</p>	<p>1. Make a compact call on Colorado for La Plata Compact deliveries to NM (NMISC in cooperation with the La Plata Conservancy District)</p>	<p><b>R</b></p>
<p><b>4. Animas La Plata Project Compact</b></p>	<p>1. Coordinate on proposed plans for ALP Operations for delivery within NM</p> <p>2. Coordinate on approved ALP operations for NM users SJWC coordination with ALP Operating entity SJWC/NMISC Proposal to NMOSE for routing within NM SJWC enforcement actions of Colorado ALP settlement. NMISC engagement with Colorado, if and as needed)</p>	<p><b>M</b></p> <p><b>M</b></p>
<p><b>5. Operating Plan for Colorado River Reservoirs</b></p>	<p>1. San Juan River Recovery Implementation Program (Basin Stakeholders / NMDGF / NMISC / Reclamation / FWS)</p>	<p><b>M</b></p>

<b>Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions</b>		
<b>Impacts</b>	<b>[Emergency and Mitigation] Response and Proposed Actions / Current Status</b>	<b>R or M</b>
	2. Drought Contingency Plans and Upper Basin Drought Response Operations Agreement (DOI/7-Basin States/Mexico/UCRC)	<b>M</b>
<b>6. Colorado River Salinity Title II, Public Law 93-320, Amended:</b> a. Drought will negatively impact States' ability to achieve desired salinity levels	1. Proactively Engage in Colorado River Salinity Control Program (Salinity Control Forum and Advisory Council/7-Basin States/NMISC)	<b>M</b>
<b>7. Interim Surplus Guidelines</b>	1. No response identified	
<b>8. Colorado River Delta</b>	1. No response identified	
<b>9. New Mexico's 14,000 Acre-Foot Gila River Allocation</b> a. Likelihood of consumptive use in New Mexico without injury to downstream users negatively impacted by drought or reduced stream flows in the basin	1. New Mexico Unit of the Central Arizona Project EIS	<b>M</b>
<b>Pecos River Basin</b>		
<b>1. Pecos River Compact</b> a. Ability of New Mexico to meet delivery requirements is impacted by drought conditions b. Increased likelihood of required groundwater pumping at the 2003 Pecos Settlement augmentation well fields to support Carlsbad Project supply c. ESA flow requirements for the Pecos Bluntnose Shiner compete with other demands	1. Pursue possible additional water rights purchases 2. Prepare for possible NMISC pumping to augment CID supply 3. Continue to monitor ESA flows	<b>M</b> <b>R/M</b> <b>R/M</b>
<b>Rio Grande Basin</b>		
<b>1. Amended Costilla Creek Compact</b> a. Drought will impair water supplies available to users in both states	1. Continue with water master administration in New Mexico to ensure compliance with Compact delivery requirements	<b>R/M</b>
<b>2. Rio Grande Compact</b> a. San Juan-Chama Project i. Drought may reduce quantity of San Juan-Chama Project water available to New Mexico water users ii. Drought will impact native water flows on the Rio Chama that are available to highest priority water right holders b. Above Otowi Gage on Rio Grande, New Mexico required to restrict depletions of water to the amount depleted in 1929 i. Drought will not impact New Mexico's ability to meet that restriction c. Below Otowi Gage, in the Middle Rio Grande, New Mexico required to deliver over 50% of flow measured at Otowi Gage to below Elephant Butte Reservoir i. New Mexico must absorb any transmission or evaporative losses ii. Drought will have major impact on State's ability to meet requirement iii. Failure of Bureau of Reclamation to maintain historic and efficient conveyances such as Middle Rio Grande Low Flow Channel and Elephant Butte Pilot Channel will drastically increase losses iv. Increases in endangered species and	1. Assess monitoring effort to identify SJC project allocation triggers and monitor native water diversions to protect San Juan Chama water contracted to downstream users 2. Monitor credits and debits, determine if there is a risk of having a cumulative compact credit or debit in excess of allowable 3. Continue to support pilot channel maintenance to assist in delivery of Compact delivery water and monitor activities that may increase depletions and negatively impact Compact deliveries 4. Continue to engage with ESA process, ESA commitments required in the 2016 Biological Opinion, while protecting water users 5. Continue to monitor reservoir inflows, storage, and outflows and pursue resolution to litigation	<b>R/M</b> <b>M</b> <b>M</b> <b>M</b> <b>M</b>

<b>Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions</b>		
<b>Impacts</b>	<b>[Emergency and Mitigation] Response and Proposed Actions / Current Status</b>	<b>R or M</b>
<p>non-native habitat have increased depletions that New Mexico must accommodate</p> <p>d. Below Elephant Butte, in the Lower Rio Grande, irrigation is currently managed pursuant to an Operating Agreement. Project storage in Elephant Butte is greatly impacted by drought. The volume of project storage further impacts the ability to store water in upstream reservoirs, as well as the amount of irrigation water available to downstream irrigators in New Mexico</p> <p>i. Drought impacts will be severe</p>		
<b>Statewide</b>		
<p><b>1. Acequias</b></p> <p>a. Drought will impair supply of water to acequias</p>	Encourage shortage sharing agreements between acequias sharing supply from same source	<b>M</b>
<p><b>2. Non-stream connected groundwater</b></p> <p>a. Drought will accelerate groundwater mining</p>	Monitor groundwater levels and encourage conservation if needed	<b>M</b>



Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions		
Impacts	Response and Mitigation Actions / Proposed Actions / Current Status	R or M

## DRINKING WATER

(Source: 2018 update to 2013 IAC Report)

Agencies involved: NMED, NMDOH, NMDHSEM, NMOSE		
Public Water Systems		
<p>1. Some public water systems experience system failures when operating for extended periods of drought induced operation. Responses to drought emergencies can be on an ad hoc, reactive mode.</p>	<p><b>Proposed actions</b></p> <ol style="list-style-type: none"> <li>Utilize the system's Emergency Response Plans first when they request assistance for drought related issues</li> <li>Create a water supply emergency fact sheet for the public sector suppliers</li> <li>Develop outreach strategy to work with PWS to ensure education and support is available and ongoing well maintenance is a priority.</li> </ol>	<p>R</p> <p>R</p> <p>M</p>
	<p><b>Response / Current Status</b></p> <ol style="list-style-type: none"> <li>NMED DWB identifies drought vulnerable PWS as community water systems with only one available source of water</li> <li>NMED DWB requires community PWS to develop Operations and Maintenance (OMP) and Emergency Response Plans (ERP) and has templates available online to assist with completion. These plans can include a possible plan of action to address drought-related problems and the ERP should identify an alternative source of water if the PWS cannot produce water. Water systems are supposed to monitor their wells, which should be an indicator of drought. Some PWS restrict the number of users or do not allow any new users to join due to not having enough water rights. (Drought can contribute to this issue).</li> <li>An emergency declaration must be made and the system must not have funding already available in order for a PWS to receive emergency funding, which is administered by the Local Government Division of NMDFA.</li> <li>The NMED DWB Sustainable Water Infrastructure Teams continue to work with water systems that are impacted by drought to provide technical assistance and planning, help build financial, managerial and technical capacity.</li> <li>Emergency is the last resort for public water systems when drinking water is impaired or cannot be produced. The NMDHSEM has the authority to coordinate emergency water hauling operations upon NMED DWB inspection and approval of the water haulers to assist PWS when water runs out. There is a need to create a water supply emergency fact sheet for the public sector suppliers to minimize confusion for these kinds of requests.</li> </ol>	<p>R/M</p> <p>M</p> <p>R</p> <p>M</p> <p>R/M</p>
<p>2. Basic information on well levels, water rates, storage capacity and delivery mechanisms are often poor.</p>	<ol style="list-style-type: none"> <li>No comprehensive analysis has been completed, but standard rates can be used to determine ability to pay. Addressed in PWS operation and management plan. NMED DWB public database has PWS facility information available <a href="https://dww.water.net.env.nm.gov/NMDWWW/">https://dww.water.net.env.nm.gov/NMDWWW/</a> and the annual water and sewer rate survey compiles water rate information</li> </ol>	<p>M</p>

<b>Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions</b>		
<b>Impacts</b>	<b>Response and Mitigation Actions / Proposed Actions / Current Status</b>	<b>R or M</b>
	<a href="https://www.env.nm.gov/drinking_water/rates/">https://www.env.nm.gov/drinking_water/rates/</a>	
<b>3. Reactions to water shortages usually only feature supply options, no matter the cost.</b>	<p><b>Proposed actions</b></p> <ol style="list-style-type: none"> <li>1. Review NMDFA's procedures to ensure essential agencies are aware of their roles</li> </ol> <p><b>Response / Current Status</b></p> <ol style="list-style-type: none"> <li>1. NMED DWB assists with rate studies so systems can understand how to create a tiered pricing structure and encourages systems to develop multiple, diverse water supply sources.</li> <li>2. NMED CPB staff is able to prioritize loans related to drought. Loans associated with emergencies are expedited by staff and effectively moved as quickly as possible without breaking any programmatic policy.</li> <li>3. There is a flow chart regarding NMED's role in approving emergency funding for other agencies (specifically the NMDFA CDBG program) and NMDFA also must have a written procedure for this program of which NMED's approval is just one part.</li> </ol>	<p><b>M</b></p> <p><b>R/M</b></p> <p><b>R</b></p> <p><b>R</b></p>
<b>4. Responses to the drought by public water systems vary.</b>	<p><b>Proposed actions</b></p> <ol style="list-style-type: none"> <li>1. Review existing programs in NMED CPB and DWB, NMOSE, and NMDFA. Determine how best to support each program to limit ad hoc responses.</li> </ol> <p><b>Response / Current Status</b></p> <ol style="list-style-type: none"> <li>1. NMOSE regulates PWS for water conservation and quantity of water used. NMED has no conservation policy other than their DWB recommending that water systems create a water conservation plan.</li> <li>2. Case by case.</li> </ol>	<p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p>
<b>5. Encourage use of water efficient products</b>	<p><b>Proposed actions</b></p> <ol style="list-style-type: none"> <li>1. Promote USEPA WaterSense activities</li> </ol> <p><b>Response / Current Status</b></p> <ol style="list-style-type: none"> <li>1. Drinking Water American Reinvestment and Recovery Act provided funding that was able to support city rebate programs for water conservation products (e.g. Albuquerque and Santa Fe)</li> <li>2. Drinking Water State Revolving Loan Fund can provide subsidies for 100% Green project, including water efficiency as defined in <a href="https://www.epa.gov/sites/production/files/2015-04/documents/green_project_reserve_eligibility_guidance.pdf">https://www.epa.gov/sites/production/files/2015-04/documents/green_project_reserve_eligibility_guidance.pdf</a></li> </ol>	<p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p>
<b>Surface and Groundwater Quality</b>		
<b>1. Salinity Increases in LRG Water Planning Region</b>	<p><b>Proposed actions</b></p> <ol style="list-style-type: none"> <li>1. Continue with the LRG monitoring program</li> <li>2. Develop a work plan for funding and implementation of target projects where reduction in salinity could increase the available water supply.</li> <li>3. Attain congressional support for federal funds for salinity control and mitigation projects.</li> <li>4. Conduct feasibility studies for salinity capture and treatment in the Rio Grande Project region.</li> </ol> <p><b>Response / Current Status</b></p> <ol style="list-style-type: none"> <li>1. The USGS Mesilla Basin monitoring program was established in 1987 to document the hydrologic conditions of New Mexico's southern-most, Rio Grande</li> </ol>	<p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p>

<b>Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions</b>		
<b>Impacts</b>	<b>Response and Mitigation Actions / Proposed Actions / Current Status</b>	<b>R or M</b>
	<p>rift basin. Currently, the program's data collection and reporting are conducted by the USGS in cooperation with NMISC.</p> <ol style="list-style-type: none"> <li>The purpose of the long-term monitoring program is to document ground-water conditions including stream-aquifer relations and provide essential data to develop and evaluate water-management strategies.</li> <li>NMED and NMISC facilitated the formation of Rio Grande Salinity Management Coalition consisting of water managers, the Rio Grande Compact Commission, and water user groups from Colorado, New Mexico and Texas that are actively working together to reduce and manage salinity in the Rio Grande Project area.</li> <li>In 2009 NMED, NMISC, and the USACE completed the first phase of a Water Resources Development Act Section 729 Rio Grande Salinity Management Program which included a geospatial salinity database; a USGS Rio Grande Salinity Assessment Study; and Rio Grande Economic Impact Assessment study.</li> </ol>	<p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p>
<b>2. Continue to sample on a rotational basis</b>	<p><b>Proposed actions</b></p> <ol style="list-style-type: none"> <li>No new proposed actions</li> </ol> <p><b>Response / Current Status</b></p> <ol style="list-style-type: none"> <li>Based on a rotational 2-year survey schedule, NMED SWQB monitors approximately one-quarter of the state's surface waters in any given year. SWQB anticipates some of the streams that are monitored will go dry in some years, depending on the conditions. Field sampling plans can be found on SWQB's website. (<a href="https://www.env.nm.gov/surface-water-quality/water-quality-monitoring/">https://www.env.nm.gov/surface-water-quality/water-quality-monitoring/</a>)</li> <li>Continue to sample on a rotational basis as described in the NMED SWQB 10-year monitoring and assessment strategy. Adjust sampling plans as needed when drought impacts are acute. (<a href="https://www.env.nm.gov/swqb/MAS/monitoring/10-yearmonitoringplan_FINAL_June2016.pdf">https://www.env.nm.gov/swqb/MAS/monitoring/10-yearmonitoringplan_FINAL_June2016.pdf</a>)</li> </ol>	<p><b>M</b></p> <p><b>M</b></p>
<b>Additional Information regarding PWS</b>		
<b>1. Public Water Systems that had water supplies affected by drought</b>	<ol style="list-style-type: none"> <li>Attached the NMED DWB queried a list of community public drinking water systems with only one source of water in October 2018 from the database. This list changes as systems update drinking water sources, but in October 2018 there were 122 community drinking water systems out of 568 total that meet the vulnerable criteria.</li> </ol>	<b>R/M</b>
<b>2. List of water systems affected by the drought in the SE part of the state</b>	<ol style="list-style-type: none"> <li>We can realistically include all water systems on the Ogalalla aquifer. They are experiencing dropping water levels, forcing deeper wells to hit bottom of water bearing strata.</li> </ol>	<b>R/M</b>
<b>Public Health Impacts to Drinking Water</b>		
<b>1. Contaminant levels can be increased due to stresses on PWS infrastructure resulting from prolonged drought</b>	<ol style="list-style-type: none"> <li>Continue to cooperate with partners to ensure that potable water haulers used in emergencies are approved by NMED DWB for hauling drinking water and inspected as necessary prior to water being served to the public from them.</li> <li>DWB works with PWS to provide public alerts when boil water advisories are required.</li> </ol>	<p><b>R/M</b></p> <p><b>R</b></p>

<b>Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions</b>		
<b>Impacts</b>	<b>Response and Mitigation Actions / Proposed Actions / Current Status</b>	<b>R or M</b>
	3. DWB works with PWS to require treatment is installed when maximum contamination levels are exceeded.	R/M
<b>2. Risk of private wells running dry</b>	<p><b>Response / Current Status</b></p> <ol style="list-style-type: none"> <li>1. Provide residents with lists of alternative water sources (or water hauling sites) should wells go dry.</li> <li>2. Provide emergency response funding to cover purchase of water for human consumption and basic hygiene (e.g., showering stations).</li> <li>3. Provide technical assistance to communities on private well water issues.</li> </ol> <p><b>Agencies / Proposed actions</b></p> <ol style="list-style-type: none"> <li>1. NMDOH works with NMED's GWQB</li> <li>2. Propose to develop drought resource for public health professionals</li> </ol>	<p>R</p> <p>R</p> <p>M</p> <p>R/M</p> <p>M</p>

## WILDLIFE

Source: 2018 update to the 2002 v2 Drought Plan

<b>Responsible agencies for items below: NMDGW, USFWS, NMED, NMEMNRD, USBLM, NMISC, USNPS</b>		
<b>An assessment of drought- related environmental impacts should be conducted for the state to define qualitatively and quantitatively problems for planning purposes and critical decision-making.</b>	<p><b>The assessment will be conducted to:</b></p> <ol style="list-style-type: none"> <li>1. Identify baseline conditions, major potential impacts, and offer an evaluation of findings and considerations of alternatives to alleviate negative impacts.</li> <li>2. Identify alternatives that involve systems control that should be evaluated for their: speed (how quickly stressors or disturbances can be eliminated), precision (the ability to achieve a desired outcome), reliability (conditions under which management approaches succeed or fail), and cost effectiveness.</li> <li>3. Summarize findings and present in regional management plans.</li> </ol>	<p>M</p> <p>M</p> <p>M</p>
<b>Responsible agencies for items below: ALL</b>		
<b>During periods of drought, reduced stream flow may affect endangered species of aquatic plants and animals.</b>	<ol style="list-style-type: none"> <li>1. Prior to drought, develop prioritized list of possible drought affected habitats for endangered species of aquatic plants and animals.</li> <li>2. Based on priority areas, develop alternatives for sustaining existing habitat or developing emergency habitats for targeted species. Provide briefing for Governor on T and E species obligations.</li> <li>3. Prior to drought, initiate partnerships with local water users and regulatory agencies in priority areas to develop emergency alternatives for in-stream flow manipulation.</li> </ol>	<p>M</p> <p>R/M</p> <p>M</p>
<b>Responsible agencies for items below: NMDGF, USFWS, NMOSE, NMISC</b>		
<b>During periods of drought, low stream or lake levels may cause fishing opportunities to diminish.</b>	<ol style="list-style-type: none"> <li>1. Develop partnerships with major water users to develop alternatives for providing emergency water transfers to affected lakes and/or streams.</li> </ol>	M
<b>Responsible agencies for items below: NMEDD, NMTD</b>		
<b>Reduction in income on private drought affected fish and wildlife-based enterprises</b>	<ol style="list-style-type: none"> <li>1. Assist in developing economic analyses, by climatic regions, to reflect reduced private hunting and fishing revenues for 25%, 50%, 75% reduction in hunting and fishing opportunities.</li> <li>2. Provide enterprise stabilization training sessions for private fish and wildlife-based enterprises, emphasizing drought contingency planning for the enterprise.</li> </ol>	<p>M</p> <p>M</p>
<b>Responsible agencies for items below: ALL</b>		

**Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions**

Impacts	Response and Mitigation Actions / Proposed Actions / Current Status	R or M
<p>While flows may be adequate to sustain aquatic plants and animals during the irrigation season (except when flows are excluded from natural channels), they often become critically low at other times. Extensive manipulation of flows through large reservoirs and irrigation canals serves to disrupt the continuity of aquatic habitats in time and space, often precluding the existence of an attractive perennial fishery. Habitat simplification and fragmentation often results from regulated flows leading to altered ecological functions, different levels of biological organization, and reduced biological diversity. This may also contribute significantly to the demise of numerous types of fish.</p>	<ol style="list-style-type: none"> <li>Several alternative approaches exist for the establishment of in-stream flows that would sustain aquatic life forms, including during periods of drought. These alternative approaches should be assessed for their applicability to different situations and locations in New Mexico, with emphasis on areas of impaired habitat and areas vulnerable to cumulative stress.</li> <li>Initiate discussions with local water users in priority areas to assess alternatives for in-stream flow.</li> </ol>	<p><b>M</b></p> <p><b>M</b></p>
<p><b>Responsible agencies for items below: NMDGF, USFWS, USFS, USBLM, USNPS</b></p>		
<p>Many populations of big game species respond to drought conditions through reduced reproductive and survival rates and increased mortality rates. Land uses such as livestock grazing can exacerbate the effect of drought through competition for limited resources. Drought conditions may reduce the amount of available wildlife drinking water, affect the amount of usual food supply for wildlife species and may cause species to migrate to areas of adequate food and water. Drought conditions may also reduce grain production at waterfowl refuges. All of these items may increase the incidence of wildlife depredation on private interests.</p>	<ol style="list-style-type: none"> <li>Examine alternatives for reducing competitive land uses during periods of drought.</li> <li>Consider careful reduction of big game species populations in areas where concerns of forage resource damage arise due to sustained periods of drought.</li> <li>Develop priority list of waterfowl refuges vulnerable to drought induced feedstock reductions. From priority list, develop waterfowl feeding alternatives, including local farmer emergency agreements.</li> <li>Continue NMDGF wildlife depredation program. Emphasize public education programs to address wildlife survival and hunting restrictions during drought.</li> <li>Prior to drought, determine the effect of alternative hunting seasons on the compensatory response of populations of drought affected species.</li> </ol>	<p><b>M</b></p> <p><b>R/M</b></p> <p><b>R/M</b></p> <p><b>R/M</b></p> <p><b>M</b></p>
<p><b>Responsible agencies for items below: NMDGF, USFWS</b></p>		
<p>Fish habitat conditions may deteriorate at some sites during times of drought and preclude recreational fishery management programs that are reliant on hatchery produced fish. There may be insufficient water to produce fish at existing hatcheries.</p>	<ol style="list-style-type: none"> <li>If necessary, temporarily curtail fish stocking programs where habitat conditions become unsuitable for species of stocked fish.</li> <li>If necessary, curtail hatchery production and reallocate inventory of fish to alternative recreational fishing sites.</li> <li>Re-engineer hatchery water delivery systems to provide technical solutions to possible water quality problems.</li> </ol>	<p><b>R/M</b></p> <p><b>R/M</b></p> <p><b>M</b></p>
<p><b>Responsible agencies for items below: NMDGF, USFWS</b></p>		
<p>Loss or impairment of fish and wildlife resources, fragmented ecosystems and animal populations; altered ecosystem functions and energy pathways; reduced productivity.</p>	<ol style="list-style-type: none"> <li>Implement corrective and compensatory adjustments through fishing and hunting regulations</li> <li>Conduct public education programs.</li> </ol>	<p><b>R/M</b></p> <p><b>R/M</b></p>
<p><b>Responsible agencies for items below: NMDGF, USFWS</b></p>		
<p>Unfavorable public opinion and public concern about fish and wildlife conservation and preservation, along with environmental protection.</p>	<ol style="list-style-type: none"> <li>Enhance sport-fishing opportunities by stocking hatchery-produced fish where habitat conditions permit.</li> <li>Employ aquaculture to secure and enhance the status of non-game species of fish including state and federal listed endangered species.</li> </ol>	<p><b>M</b></p> <p><b>M</b></p>
<p><b>Responsible agencies for items below: (none identified)</b></p>		
<p>Discussion of general drought impacts if there is a "normal" moisture year following a drought year, or if drought conditions persist</p>	<p><b>In a "normal" year:</b></p> <ol style="list-style-type: none"> <li>The Pecos and Rio Grande flows may still be below normal, depending on severity of previous year's</li> </ol>	<p><b>M</b></p>

<b>Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions</b>		
<b>Impacts</b>	<b>Response and Mitigation Actions / Proposed Actions / Current Status</b>	<b>R or M</b>
for multiple years.	<p>drought, and operations will have to be undertaken to protect the Silvery Minnow and potentially the Pecos Blunt Nose Shiner. NMDGF and USFWS will continue to utilize the Rock Lake Hatchery and Dexter National Fish Hatchery. These agencies will also partner with City of Albuquerque and other local governments and agencies.</p> <ol style="list-style-type: none"> <li>Continued low river flows will affect recreational fishing by limiting or eliminating opportunities.</li> <li>Anticipate continued human/wildlife interactions and depredation.</li> <li>Game animal populations will continue to be reduced due to decreased habitat. Anticipate increases and decreases in allowable hunting to conserve populations.</li> </ol>	R or M
<b>It is assumed the effects of drought are cumulative on wildlife species, hence one year of normal will not alleviate all effects experienced in a drought year..</b>	<p><b>In a persistent, multiple-year drought:</b></p> <ol style="list-style-type: none"> <li>Increased depredation, especially from bear, elk and deer.</li> <li>Increased supplemental feeding will be required to maintain migratory waterfowl.</li> <li>Increased restrictions on the Rio Grande will greatly impact endangered species. Endangered species issues will become more divisive. Anticipate additional litigation affecting agricultural and domestic water use.</li> <li>Anticipate bear, elk and deer populations to be greatly reduced but to remain viable.</li> </ol>	M

## **WILDFIRE**

Source: 2018 update to the 2013 IAC Report

**Agencies involved: SWCC, USFS, USBLM, USBIA, USFWS, USNPS, NMEMNRD**

<p><b>1. Monitoring and Assessing Fire Danger Conditions.</b></p> <p>Drought increases wildland fire danger to extreme conditions for an extended period of time. The fire season, which used to run from May 1 to July 15th, starts earlier and lasts longer. NM is now seeing higher elevation spruce-fir forests burn at the height of fire season with an unprecedented intensity beyond fire suppression capabilities. Agencies responsible for wildland fire management need fire danger and climate data to plan actions.</p>	<p><b>1. Wildland Fire</b></p> <ol style="list-style-type: none"> <li>Monitor fire danger conditions in the field.</li> <li>Coordinate collection and analysis of fire season data at the SWCC. SWCC will assure data quality through testing and calibration of Remote Automated Weather Stations (RAWS). New stations at Pendaries and Cimarron installed and tested.</li> <li>Utilize the Energy Release Component (ERC) chart published by the SWCC to monitor and compare fire danger potential by year. Disseminate fire season data through the SWCC website.</li> <li>In assessing fire danger conditions, assume "normal" winter/spring precipitation will not alleviate all the effects of the 2011-2012 drought. Assume a drought similar to 2011-2012 would have a multiplied effect. Expect and plan for an earlier, longer and more intense fire season.</li> </ol>	<p>R/M R/M</p> <p>R/M</p> <p>M</p>
<p><b>2. Fire Management Activities</b></p> <p>Increased fire danger results in more fires and more acres burned. Wildland fires are more intense and spread more rapidly. Wildland fires are larger and harder to control. The threat to firefighter and public safety increases.</p> <p>NM has begun experiencing unprecedented</p>	<p><b>1. Fire Prevention</b></p> <ol style="list-style-type: none"> <li>Conduct aggressive fire prevention media campaign to reduce the number of careless or negligent human-caused fires. Educate the public through media, signage, patrols and law enforcement.</li> <li>Federal and state agencies and local governments implement fire restrictions and closures as fire danger increases. In severe drought years, anticipate extended and extensive</li> </ol>	<p>M</p> <p>R</p>

**Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions**

Impacts	Response and Mitigation Actions / Proposed Actions / Current Status	R or M
<p>fires that threaten multiple communities on a year-round basis. Fire danger in all forest types is exacerbated by drought-related insect damage.</p> <p>There is higher potential for multiple structures to be damaged or destroyed and higher likelihood that numerous citizens could be affected by evacuations that last more than three days, and/or by post-fire flood impacts.</p> <p>Fire suppression costs could reach record levels in severe drought years. Lack of fire suppression resources will result in no action on large fires burning in remote areas.</p>	<p>closures of federal lands. Closures could also affect State Parks and State Game and Fish lands. Work with federal land management agencies to focus closures to minimize impact to rural economies.</p> <p>c. Utilize law enforcement to encourage responsible stewardship by citizens. Utilize a multi-agency task force approach to investigate difficult or persistent incidents.</p> <p>d. Implement local government ordinances requiring defensible space in new developments and new construction standards. See NMFPTF recommendations for adopting International Wildland-Urban Interface Code</p> <p><b>2. Fire Pre-Suppression</b></p> <p>a. Conduct fire pre-suppression activities to promote wildland fire training, equipment and agency commitment. Provide wildland firefighter and fire department training to promote national wildland fire qualification standards.</p> <p>b. Provide state and federal grants to fire departments to improve wildland fire equipment and organization.</p> <p>c. Develop Resource Mobilization Plan agreements between NMEMNRD and local governments to provide statewide mobilization of qualified structural firefighting resources for wildland/urban interface fires. NM has increased the amount and quality of equipment provided by RMP participants as well as increased capacity. Municipal and county JPAs all updated.</p> <p>d. Utilize federal funds to increase local fire department capacity by offering wildland fire training on weekends and after hours.</p> <p><b>3. Suppression</b></p> <p>a. Prioritize firefighter and public safety for all fire suppression operations. Initial attack fires aggressively but provide for safety first.</p> <p>b. Continue to develop Type III organizations for each Interagency Zone Dispatch area to support initial attack efforts.</p>	<p><b>R</b></p> <p><b>R/M</b></p> <p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p> <p><b>R/M</b></p> <p><b>R/M</b></p>
<p><b>Agencies involved: NMEMNRD Forestry Division, NMDPS, NMDHSEM, federal land management agencies</b></p>		
<p><b>3. Fires that Threaten Communities</b></p> <p>Increased fire danger increases the probability of large forest stand replacement fires that can catastrophically affect watersheds and threaten communities. Public safety is threatened. Property and natural resource loss can be severe.</p>	<p>1. <b>Prioritize Fire Incidents:</b> Follow the prioritization process established by the Interagency Southwest Coordination Group.</p> <p>a. Control all new fire starts. Keep fires small. Initial attack fires get first priority.</p> <p>b. Prioritize fire incidents that threaten communities where public safety and property are threatened. Give priority to watersheds that directly serve community water systems.</p> <p>c. Consider fires in remote locales a lower priority.</p> <p>2. <b>Coordinate Evacuations:</b> NMEMNRD will coordinate requests for non-fire related state resources. NMEMNRD will coordinate requests for state resources through the NMDHSEM. Coordinate evacuation operations with the wildland fire Incident Management Teams.</p> <p>3. <b>Fuels Reduction Treatments:</b> Implement the New Mexico Fire Plan and National Cohesive Wildland Fire</p>	<p><b>R</b></p> <p><b>R</b></p> <p><b>M</b></p>

**Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions**

Impacts	Response and Mitigation Actions / Proposed Actions / Current Status	R or M
	<p>Strategy to prioritize fuels reduction and defensible space work in communities most at risk from catastrophic wildland fires. Recognize that making communities safer is a long term project that can only be accomplished through partnerships with federal and state agencies and local governments working with citizens in their backyards, with communities in the wildland/urban interface and with the resource agencies in fire-prone lands. Community leadership is very important. Projects should be designed collaboratively.</p> <p>4. <b>Monitoring:</b> Agencies should monitor and evaluate fuel treatment projects and transmit lessons learned to land managers. Coordinate with research institutes and organizations working on monitoring and disseminating information.</p> <p>5. <b>NMEMNRD Forestry Division will host the NMFPTF:</b> The NMFPTF will review priority communities at risk, develop model ordinances and building codes, and provide recommendations to the Governor by December 15th each year.</p> <p>6. <b>Conservation Easements to Reduce Development in Forest Lands:</b> Continue to implement the Forest Legacy and Land Conservation Incentives program through NMEMNRD Forestry Division to purchase conservation easements to reduce development in high-risk communities threatened by development.</p>	<p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p>
<p><b>4. Forest and Watershed Health</b></p> <p>Drought can affect forest health by increasing susceptibility to insects and disease and destructive wildfires. Large stands of insect mortality that have occurred across the state greatly increase the risk of negative impacts on New Mexico's watersheds including higher fire danger.</p> <p>In wetter years, trees will regain some live fuel moisture and be less prone to crown fires. Trees will also increase in vigor and ability to withstand insect attacks.</p> <p>In drought years, anticipate increased mortality due to insect and disease epidemics. Expect community protection and restoration projects will be halted due to high fire danger. Tree seedling sales will be reduced due to concerns about water availability.</p> <p>Public agency costs for wildland fire suppression and burned area rehabilitation can be very high. Prohibitive costs to replace infrastructure and rehabilitate burned areas can result in additional downstream impacts.</p> <p>Watersheds throughout the state are susceptible to damage by catastrophic fire and insect and disease infestations because forests are in an unhealthy condition.</p> <p>Elaborate review and implementation</p>	<p>1. Implement actions to improve forest and watershed health outlined in the New Mexico Forest and Watershed Health Plan and the New Mexico Statewide Natural Resources Assessment and Strategy and Response Plans.</p> <p>2. Recognize wildland fires are a natural process. Consider fire use and prescribed fire to reintroduce a normal fire occurrence cycle into the ecosystem, under appropriate conditions. Prescribed fire is a controversial issue. Mitigate by training prescribed fire practitioners. Agencies have completed an update of procedures to be used in coordinating prescribed fire activities, especially at high fire danger levels.</p> <p>3. Conduct mid-summer and late fall aerial and ground surveys to identify location and extent of insect and disease outbreaks. Coordinate multiagency effort through the USFS Southwest Region's Forest Health Program.</p> <p>4. Provide forest insect and disease management information to private landowners on <a href="http://www.nmforestry.com">www.nmforestry.com</a> and through other venues.</p> <p>5. Work with NMED AQB to update Smoke Management Program Rules (SMPR). The USFS and USBLM will coordinate SMPR by providing Smoke Management Specialists stationed at NMED Albuquerque.</p> <p>6. Work with NMED SWQB to implement the state's Nonpoint Source Management Plan. In any year in which a major wildfire occurs in a watershed with coldwater or cool water aquatic life, the affected watershed(s) will be identified as priority watersheds. NMED SWQB will provide information to help USFS develop Burned Area Emergency Response (BAER) plans, or to help other agencies (e.g., NMEMNRD, NMDHSEM) develop similar post-fire plans, to be used</p>	<p><b>M</b></p> <p><b>M</b></p> <p><b>R/M</b></p> <p><b>M</b></p> <p><b>M</b></p> <p><b>R/M</b></p>



**Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions**

Impacts	Response and Mitigation Actions / Proposed Actions / Current Status	R or M
<p>processes and procedures that slow down forest and watershed restoration projects on National Forest lands exacerbate the situation.</p>	<p>as the basis for project work plans.</p> <ol style="list-style-type: none"> <li>7. NMED SWQB will fund post-fire actions that reduce sedimentation and impacts to water quality, and protect aquatic habitat, with support of Clean Water Act Section 319 watershed project funds. The focus of the Section 319 funds will be on non-federal lands, strategically reducing the impacts of wildfire on water quality, and for follow-up actions after the BAER process is complete.</li> <li>8. Monitor policy and legislation that could potentially affect forest and watershed health in New Mexico. Review impacts and implementation of federal laws such as the Endangered Species Act and the National Environmental Planning Act. Work with State Forest and Watershed Health Coordinating Group and organizations such as WGA, CWSF, and NASF to promote sound policy and streamlined review and implementation processes.</li> <li>9. Design projects at the community level to gain public support for local forest restoration projects (See 6 and 7 above). Utilize the Community Restoration Act to promote community-based projects. Design cross-jurisdictional projects collaboratively with state, local, tribal and federal partners.</li> <li>10. Promote biomass utilization and small diameter forest product industries to reduce the cost of treatments and strengthen the economies of rural forest-based communities.</li> </ol>	<p>R/M</p> <p>M</p> <p>R/M</p> <p>M</p>
<p><b>5. Threatened and Endangered Plant Species</b></p> <p>Many endangered plants respond to drought conditions through reduced reproductive and survival rates and increased mortality rates. Drought can exacerbate herbivory on endangered plants, including livestock grazing, browsing, rodent and insect predation by forcing animals to eat plants that they may otherwise avoid. During drought years, animals may also concentrate in sensitive areas that support endangered plants, such as wetlands, increasing the amount of trampling, predation and erosion.</p>	<p><b>Monitor populations of rare plants to assess threats and take actions when drought related impacts are identified.</b></p> <ol style="list-style-type: none"> <li>1. Consider fencing vulnerable populations of endangered plants in sensitive areas such as wetlands.</li> <li>2. If necessary, provide rodent trapping in the most vulnerable populations of endangered plants.</li> <li>3. Regularly collect seeds of endangered plants for reintroductions or ex-situ conservation programs.</li> <li>4. Work with state and federal fire agencies to increase awareness of endangered plant habitats to minimize or avoid impacts of fire management activities on endangered species.</li> </ol>	<p>R/M</p>
<p><b>5. Air Quality Issues</b></p>	<ol style="list-style-type: none"> <li>1. SMPR were adopted and became effective 12/31/03. USBLM staffs the Smoke Management Specialist position which is housed in the NMED AQB.</li> <li>2. The AQB coordinates with the burners (including federal land managers) and the NMDOH to ensure the public is notified regarding the potential impacts from smoke from wildfires. In addition, the AQB has required that a prescribed burn not be implemented when the area was already experiencing a significant impact from smoke.</li> </ol>	<p>M</p> <p>R/M</p>
<p><b>AGRICULTURE</b> (Source: 2018 update to 2013 IAC Report)</p>		
<p><b>Economic – Agencies involved FSA, NMDA, NMSU CES , agricultural organizations</b></p>		
<p><b>1. Economic - Crop</b></p>	<p>1. The NMDA collaborates with U.S. Department of</p>	<p>R</p>

**Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions**

Impacts	Response and Mitigation Actions / Proposed Actions / Current Status	R or M
<ul style="list-style-type: none"> <li>a. Loss of production</li> <li>b. Farmland left fallow due to lack of water.</li> <li>c. Decreased yields.</li> <li>d. Increased cost of production for pumping groundwater in areas where surface water is short.</li> <li>e. Costs associated with deepening wells due to lowering of water table.</li> </ul> <p><b>2. Economic – Livestock</b></p> <ul style="list-style-type: none"> <li>a. Loss of Production</li> <li>b. Decrease in cattle numbers due to lack of grass production.</li> <li>c. Lower weaning weights.</li> <li>d. Decreased conception rates leading to poor calf crops.</li> <li>e. Increased cost of production due to heavy supplemental feeding (compounded by high commodity and hay prices).</li> <li>f. Increase in production costs due to water hauling costs.</li> <li>g. Tax liabilities from herd liquidations.</li> <li>h. Decreased tax roles for counties.</li> </ul> <p><b>3. Economic - Dairy</b></p> <ul style="list-style-type: none"> <li>a. Regional/national drought cause commodity and hay prices to escalate.</li> <li>b. Cost of milk production increase</li> <li>c. Increased freight costs due to sourcing feed from further distances.</li> </ul>	<p>Agriculture’s FSA on the drought declaration process.</p> <ul style="list-style-type: none"> <li>a. Most FSA disaster declaration automatically triggers for counties in the USDM level of D2 for 8 consecutive weeks or any time under D3 or D4. The Governor can also initiate a disaster request.</li> <li>b. NMDA communicates among stakeholders declaration status, governor’s executive orders, program information and resources available.</li> <li>c. The 2014 Farm Bill has expired and only a few programs continue under resolution. Until a new Farm Bill is established in 2019 the extent of disaster programs is uncertain.</li> <li>d. Program for emergency grazing on CRP acreage. Various stipulations apply.</li> </ul> <p>2. Insurance coverage is available for some areas of ag production. Policies are not available for all commodities; areas of the state; can be costly; have some systematic flaws in uniformly covering losses. A revised program addressing rangeland forage loss due to drought was implemented.</p> <p>3. NMDA disseminates any available information to producers about tax implications due to liquidation/culling and pasture management/recovery after drought.</p> <p>4. NMDA collaborates with agricultural organizations to locate sources of hay. During emergency situations (fire) dependence is placed on donated hay as the state anti-donation clause precludes the use of state funds for hay purchases.</p>	<p>R</p> <p>R</p> <p>R</p>
<b>Management – Agencies involved: NMDA, USDA</b>		
<p><b>1. Management - Crop</b></p> <ul style="list-style-type: none"> <li>a. Changes in crop rotation patterns.</li> <li>b. Movement to less water consumptive crops.</li> <li>c. Soil salinity problems associated with decreased surface water availability.</li> </ul> <p><b>2. Management – Livestock</b></p> <ul style="list-style-type: none"> <li>a. Drought must be incorporated into range management plans.</li> <li>b. Reduced forage production increases need for range improvements to improve livestock distribution.</li> </ul> <p><b>3. Management - Dairy</b></p> <ul style="list-style-type: none"> <li>a. Reformulation of feed rations using cheaper sources has resulted in decreased milk production.</li> </ul>	<ul style="list-style-type: none"> <li>1. Agricultural sector (crop and livestock producers) will be kept informed of current and long-range climatic conditions in order to facilitate farm/ranch management plans. Tools used for monitoring include:</li> <li>2. USDM -- input provided to supplement limited climatic data and/or unique situations.</li> <li>3. USDA – National Agricultural Statistics Service New Mexico Weekly Crop and Weather bulletin, reports the following: county comments, status of crop production, livestock, soil moisture and range/pasture conditions, and precipitation statewide.</li> <li>4. Departure from average NDVI. The NDVI is a measure of photosynthetic activity on the earth’s surface calculated using infrared and near-infrared data from satellite sensors. The departure from average index is the deviation from average for a specific time period.</li> <li>5. VegDRI (<a href="http://vegdiri.unl.edu/Home.aspx">http://vegdiri.unl.edu/Home.aspx</a>). VegDRI maps provide regional to sub-county scale information about drought’s effects on vegetation. The VegDRI calculations integrate satellite-based observations of vegetation conditions, climate data, and other biophysical information such as land cover/land use type, soil characteristics, and ecological setting.</li> <li>6. NMDA provides technical assistance in developing range management plans. Including communication, consultation and cooperation between state, federal and industry organizations to develop monitoring and mitigation strategies prior to grazing on federal land.</li> </ul>	<p>R/M</p> <p>R/M</p> <p>R/M</p> <p>R/M</p> <p>R/M</p> <p>M</p>

**Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions**

Impacts	Response and Mitigation Actions / Proposed Actions / Current Status	R or M
<b>Natural Resources – Agencies involved: NMDA, SWCDs, NMLB</b>		
<p><b>1. Natural Resources</b></p> <ul style="list-style-type: none"> <li>a. Decreased forage production.</li> <li>b. Increased erosion from wind and water.</li> <li>c. Increased fire frequency, intensity, and severity.</li> <li>d. Burn scars are slow to recover without adequate precipitation.</li> <li>e. Increased likelihood of watershed health problems.</li> <li>f. Increased potential of invasive species establishment.</li> </ul>	<ul style="list-style-type: none"> <li>1. Soil and Water Conservation Districts coordinate assistance from all available sources - public and private, local, state and federal - in an effort to develop locally-driven solutions to local natural resource concerns.</li> <li>2. NMDA provides technical assistance to SWCDs, Counties, and Federal agencies in developing Resource Management Plans.</li> <li>3. Cooperative Weed Management Areas are a partnership of federal, state, and local government agencies, tribes, individuals, and various interested groups cooperating to manage noxious weeds or invasive plants in their area.</li> <li>4. NMDA coordinates ESF-11 activities in the state when initiated by the Emergency Operations Center (EOC). NMDA may initiate response activities under a department Emergency Response Plan under situations separate from or in conjunction with ESF-11 activities.</li> <li>5. NMDA works with county emergency responders to develop an agricultural component into the County EOP</li> </ul>	<p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p> <p><b>M</b></p>

**RECREATION, ECONOMIC DEVELOPMENT, AND TOURISM WORK GROUP**

Source: 2018 update to the 2002 v2 Drought Plan

**Responsible Agency for below impacts: NMDT, NMEDD**

<p><b>Public’s negative perception of drought situation in state will have negative effect on tourism</b></p>	<ul style="list-style-type: none"> <li>1. Complete and distribute a regression analysis on the potential effects of drought and wildfires on tourism in New Mexico. Analysis will be provided to policy makers and industry once it is completed.</li> </ul>	<p><b>M</b></p>
<p><b>Negative effect on ability to recruit new businesses to New Mexico</b></p>	<ul style="list-style-type: none"> <li>2. NMTD proactively market tourism assets that are unaffected by the drought via:                             <ul style="list-style-type: none"> <li>a. Newmexico.org</li> <li>b. Social Media channels</li> <li>c. Out Of Home ad placements</li> <li>d. Visitor Information Centers</li> <li>e. Other media channels</li> </ul> </li> <li>3. NMTD collaborate with NM State Parks to market parks                             <ul style="list-style-type: none"> <li>a. Promote parks that are unaffected by drought</li> </ul> </li> <li>4. NMTD collaborate with Federal land management agencies (USFS, USNPS) to market forests, parks, and monuments                             <ul style="list-style-type: none"> <li>a. Promote forests, parks, monuments that are unaffected by drought</li> </ul> </li> <li>5. Ski Areas, Ski New Mexico, NMTD collectively promote snowmaking capabilities                             <ul style="list-style-type: none"> <li>a. Provide and promote alternative winter recreation activities at ski areas</li> </ul> </li> <li>6. NMTD work with Regional Marketing Boards to collectively market tourism assets and develop alternative itineraries for visitors</li> <li>7. NMTD collect visitation data at Visitor Information Centers</li> <li>8. Work with the NMOSE and the NMED to develop a program to provide technical assistance to tourism related businesses for the implementation of gray water usage and redirection/recycling.</li> </ul>	<p><b>R</b></p> <p><b>R/M</b></p> <p><b>R/M</b></p> <p><b>R/M</b></p> <p><b>R/M</b></p> <p><b>R/M</b></p> <p><b>M</b></p>

<b>Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions</b>		
<b>Impacts</b>	<b>Response and Mitigation Actions / Proposed Actions / Current Status</b>	<b>R or M</b>
<b>Lack of conservation efforts will further deplete water resources in hotels/motels, restaurant, and recreation small businesses</b>	<b>Hotel/Resorts:</b>	
	1. Promote alternative landscaping.	<b>M</b>
	2. Recommend tax credits for the installation of low flow toilets and appliances.	<b>M</b>
	3. Recommend mandating multi-day linen use.	<b>M</b>
	4. Promote gray water storage and redirect.	<b>M</b>
	5. Encourage routine swimming pool maintenance/water management and redirect.	<b>M</b>
	<b>Restaurants:</b>	
	1. Recommend drinking water be made available only upon request.	<b>R/M</b>
	2. Encourage use of paper coverings to limit linen use and wash.	<b>M</b>
	3. Make disposable tableware available as an option; possibly offer meal discounts for those that opt for disposable tableware.	<b>M</b>
4. Promote alternative landscaping within industry.	<b>M</b>	
5. Recommend tax credits for the installation of low flow toilets.	<b>M</b>	
<b>Recreation Small Businesses:</b>		
1. Recommend public land/water-use permit credits to allow businesses in affected areas (rafting companies, concessionaires, etc.) to recoup costs.	<b>M</b>	
2. Provide information for emergency low interest loans through the Small Business Administration and other entities.	<b>R/M</b>	
3. Make marketing grants available when drought period is over. The NMTD offered a one-time Emergency Tourism Assistance grant program to drought affected local governments and non-profits through a special appropriation in 2002.	<b>M</b>	
4. Small Business Development Centers provide free consultation/assistance on business adaptation/diversification.	<b>M</b>	
<b>Extended drought may have substantial impact on the skiing industry.</b>	<b>Skiing Industry:</b> Most ski areas with snowmaking equipment recycle run-off from their ski slopes, and in addition collect surface water and pump groundwater to make snow. Ski areas should be encouraged to purchase and use snowmaking equipment and advertise this capability.	<b>R/M</b>
<b>NMSP projects shortfalls in camping entrance, and boating revenue sources. This is primarily attributed to drought related conditions: forest closures, park closures, fire restrictions, and low lake elevations.</b>	<b>Implement strategies to minimize projected revenue shortfalls within the NMSP while maintaining essential visitor services.</b>	
	1. Request NMDFA and NMLFC to recommend contingency funding, subject to Agency certification and NMDFA approval to offset shortfalls.	<b>R/M</b>
	2. If action above is not possible, request support to implement fee increases.	<b>R/M</b>
	3. Request funding through Executive Emergency Declarations related to drought impacts on NMSP. Each declaration could provide up to \$750,000.	<b>R/M</b>
4. If above is not possible, NMSP would need to scale down their operating budget.	<b>R/M</b>	
<b>Reduced revenues will impact hiring of seasonal positions and filling vacant permanent positions. These dollars not spent on salaries will have a negative impact on the economies of local communities near state parks.</b>	<b>Projected shortfalls can be offset with a special appropriation or some form of contingency fund and will lessen other drought related shortages.</b>	<b>R/M</b>

<b>Table C-1. DTF, DTF work groups, and state agency impact, response, and mitigation actions</b>		
<b>Impacts</b>	<b>Response and Mitigation Actions / Proposed Actions / Current Status</b>	<b>R or M</b>
<i>Responsible Agency for below impacts: NMEMNRD, NMDFA, NMLFC</i>		
Reduced lake levels have had a significant impact on recreational use.	NMSP is developing a Drought Response Action Plan (DRAP). The plan will identify both short and long term planning and management strategies for all state parks. NMSP will divert all available fiscal resources to meet the physical needs for adequate public access to state parks, such as boat ramps, roads, parking areas, and facilities.	R/M
Public perception of drought and the impacts to outdoor recreation is of primary concern. Ensuring recreational user confidence and access to parks is key to minimizing visitation and revenue losses. Reduced visitation will also impact local businesses reliant upon parks for livelihood. This could result in reduced jobs and state revenues from taxable income and gross receipts. The impact is greatest in rural areas most reliant on tourism.	Promote parks through comprehensive advertising and marketing campaigns. State Parks has never appropriated an advertising and marketing budget, which would be required in order to meet the challenge. <ol style="list-style-type: none"> <li>1. Appropriate funds for NMSP for advertising and marketing the entire State Park system. Promote alternative park uses, organize and promote more special events at all parks, promote non-lake park utilization, offset negative national publicity, and promote water conservation educational programs.</li> <li>2. Develop interpretive and educational programs focused on water issues.</li> </ol>	R/M
<i>Responsible Agency for below impacts: USBOR, USACE, Irrigation Districts, NMSP, NMDGF</i>		
Reservoir water releases occur in order to meet downstream demands. Negative impacts, due to insufficient notice to involved agencies, can be substantial.	Communication is key. All agencies with vested interests at reservoirs should be apprised of water releases in advance. Advance notice can trigger action to minimize public impact, protect resources, and enhance public perception.	R/M
<i>Responsible Agency for below impacts: NMDHSEM</i>		
Many small businesses reliant upon tourism have had substantial decreases in revenues due to wildfires and other drought impacts. In many cases, they cannot afford more debt regardless of low interest rates.	Assist businesses in accessing Federal programs for businesses impacted by natural disaster. <ol style="list-style-type: none"> <li>1. Economic Adjustment (Title IX) Program - US Department of Commerce, Economic Development Administration</li> <li>2. Business and Industrial Loan Program - USDA Rural Development, Rural Business-Cooperative Service</li> <li>3. Economic Injury Disaster Loan Program - US Small Business Administration</li> </ol>	R/M
	Assist small businesses impacted by drought through: <ol style="list-style-type: none"> <li>1. Tax credits</li> <li>2. Grant in Aid programs.</li> <li>3. Increase access to and availability of such programs as Credit Enhancement and SBA loans</li> <li>4. Assist business in accessing alternative energy sources and programs</li> </ol>	R/M