

**BRIAN SANDOVAL
GOVERNOR**

**STATE OF NEVADA
DROUGHT RESPONSE PLAN**



Revised April 2012

**DEPARTMENT OF CONSERVATION
AND NATURAL RESOURCES,
DIVISION OF WATER RESOURCES**

STATE CLIMATE OFFICE

**DEPARTMENT OF PUBLIC SAFETY,
DIVISION OF EMERGENCY
MANAGEMENT**


Executive Summary

This State Drought Response Plan establishes an administrative coordinating and reporting system between agencies to appropriately respond and provide assistance to address drought and mitigate drought impacts. After outlining the significance of drought and types of drought encountered, this Plan identifies a system used in monitoring the magnitude, severity and extent of drought within the state on a county-by-county basis. It establishes a framework of actions based on three stages of responding to drought: Drought Watch (Stage #1), Drought Alert (Stage #2) and Drought Emergency (Stage #3).

The Drought Response Committee, comprised of representatives from the State Climate Office, Division of Water Resources and Division of Emergency Management, is involved throughout each of these stages and is responsible for monitoring drought conditions, collecting data associated with drought, overseeing intergovernmental coordination, disseminating information, reporting to the Governor and working with the State Emergency Operation Center on drought response (if applicable). The Drought Response Committee may establish *ad hoc* Task Force(s). Members of Task Force(s) will serve as experts in the drought affected region, serve as liaisons to local or federal government and collect needed information about the actual and/or projected impacts of the drought. If a drought reaches Stage #3 Drought Emergency, upon the decision of the Governor, the Division of Emergency Management may activate the State Emergency Operations Center. This Center will be advised by the Drought Response Committee, making drought response policy recommendations as needed, supporting local drought emergency response efforts and carrying out the Governor's policies.


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1. Drought

Drought is a complex physical and social phenomenon of widespread significance. While lower than normal precipitation is usually the cause of specific problems creating a drought situation, a drought condition is not simply a lack of rainfall or snow accumulation but can also be related to deficiencies in soil moisture and groundwater; lack of surface water in streams and rivers; and/or reduction of surface water stored in lakes and reservoirs. A number of factors are involved in determining if a drought exists and its severity for a given region: precipitation, snowpack, soil moisture, streamflow, surface water storage and groundwater levels.

Drought is not usually a statewide phenomenon; differing situations in the state make drought local or regional in focus. Despite all the problems droughts have caused, drought has proven difficult to define. There is no universally accepted definition because drought, unlike flood, is not a distinct event and drought is often the result of many complex factors acting on and interacting within the environment. Complicating the problem of a drought definition is the fact that drought often has neither a distinct beginning nor end. It is recognizable only after a period of time and, because a drought may be interrupted by short spells of one or more wet months, its termination is difficult to recognize. The most commonly used drought definitions are based on: 1) meteorological and/or climatological conditions, 2) agricultural problems, 3) hydrological conditions and 4) socioeconomic considerations. Each type of drought will vary in severity, but all are closely related and caused by lack of precipitation. These drought types may overlap and are not always unique. Drought type descriptions are from the National Drought Mitigation Center at the University of Nebraska, Lincoln.

1.1 Meteorological Drought

Meteorological drought is defined usually on the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. Definitions of meteorological drought must be considered as region specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region. For example, some definitions of meteorological drought identify periods of drought on the basis of

the number of days with precipitation less than some specified threshold. This measure is only appropriate for regions characterized by a year-round precipitation regime such as a tropical rainforest, humid subtropical climate or humid mid-latitude climate. Other climatic regimes are characterized by a seasonal rainfall pattern. Extended periods without rainfall are common in many places so definitions based on the number of days with precipitation less than some specified threshold is unrealistic in these cases. Other definitions may relate actual precipitation departures to average amounts on monthly, seasonal or annual time scales.

1.2 Agricultural Drought

Agricultural drought links various characteristics of meteorological (or hydrological) drought to agricultural impacts, focusing on precipitation shortages, differences between actual and potential evapotranspiration, soil water deficits, reduced groundwater or reservoir levels and so forth. Plant water demand depends on the prevailing weather conditions, the biological characteristics and growth stage of the specific plant and the physical and biological properties of the soil. A good definition of agricultural drought should be able to account for the variable susceptibility of crops during different stages of crop development, from emergence to maturity. Deficient topsoil moisture at planting may hinder germination, leading to low plant populations per hectare and a reduction of final yield. However, if topsoil moisture is sufficient for early growth requirements, deficiencies in subsoil moisture at this early stage may not affect final yield if subsoil moisture is replenished as the growing season progresses or if rainfall meets plant water needs.

1.3 Hydrological Drought

Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., streamflow, reservoir and lake levels, groundwater levels). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow and groundwater

and reservoir levels. As a result, these impacts are out of phase with impacts in other economic sectors. For example, a precipitation deficiency may result in a rapid depletion of soil moisture that is almost immediately discernible to agriculturalists, but the impact of this deficiency on reservoir levels may not affect hydroelectric power production or recreational uses for many months. Also, water in hydrologic storage systems (e.g., reservoirs, rivers, groundwater) is often used for multiple and competing purposes (e.g., flood control, irrigation, recreation, navigation, hydropower, wildlife habitat), further complicating the sequence and quantification of impacts. Competition for water in these storage systems escalates during drought and conflicts between water users increase significantly.

1.4 Socioeconomic Drought

Socioeconomic definitions of drought associate the supply and demand of some economic good with elements of meteorological, hydrological and agricultural drought. It differs from the aforementioned types of drought because its occurrence depends on the time and space processes of supply and demand to identify or classify droughts. The supply of many economic goods, such as water, forage, food grains, fish and hydroelectric power, depends on weather. Because of the natural variability of climate, water supply is ample in some years but unable to meet human and environmental needs in other years. Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related shortfall in water supply. In most instances, the demand for economic goods is increasing as a result of increasing population and per capita consumption. Supply may also increase because of the improvement in production efficiency, the advancement in technology or the construction of reservoirs that increase surface water storage capacity. If both supply and demand are increasing, the critical factor is the relative rate of change. Is demand increasing more rapidly than supply? If so, the vulnerability to and the incidence of drought may increase in the future as supply and demand trends converge.

2. Drought Monitoring System

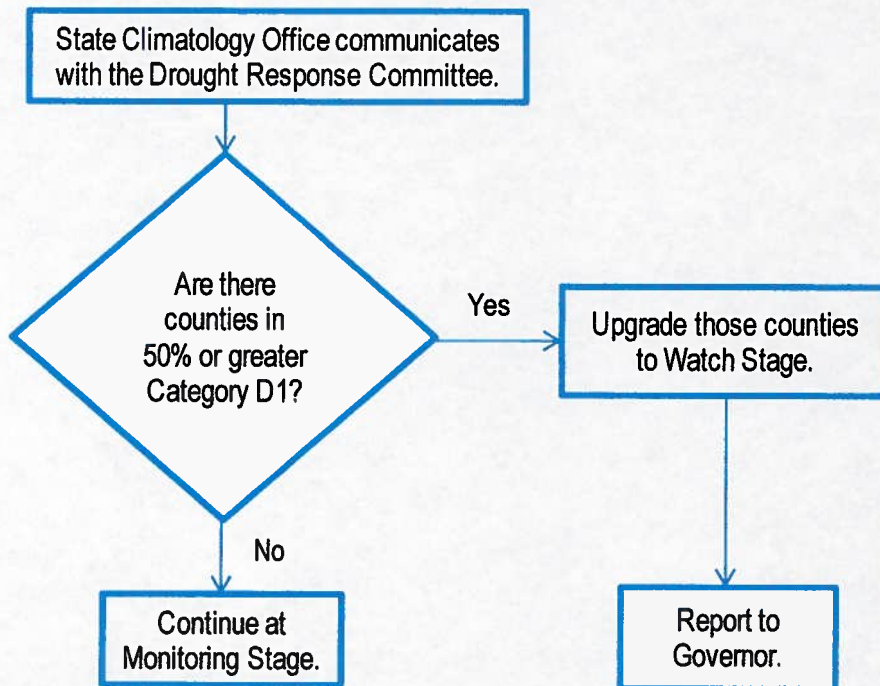
The U.S. Drought Monitor will be applied to counties in the State of Nevada to identify the initial stages of drought. Conditions indicated by the Drought Monitor will be assessed for counties as the primary political sub-units within the state. The Drought Monitor is an independent and scientific approach that synthesizes multiple drought indices, taking into account meteorological and/or climatological conditions, agricultural problems and hydrological conditions along with other available information. As a composite drought indicator, the US Drought Monitor integrates various types of drought, with a particular emphasis on the meteorological, agricultural and hydrological conditions. Issues posed by socioeconomic conditions may also be taken into account when moving into the third drought stage outlined in the following sections. The Drought Monitor is updated weekly, coordinated through the National Drought Mitigation Center at the University of Nebraska, Lincoln, with input and support from a number of federal, state and local partners nationwide. There are five drought intensity categories identified in the Drought Monitor:

- D0 Abnormally Dry
- D1 Drought – Moderate
- D2 Drought – Severe
- D3 Drought – Extreme
- D4 Drought – Exceptional

3. Measures Initiating Action

The Drought Response Committee is comprised of a representative from the Office of the State Climatologist, the Division of Water Resources and the Division of Emergency Management. Drought Response Committee members remain in contact and, if it is determined that a Watch Stage exists for any counties, then the Nevada State Climatologist will call a meeting of the Drought Response Committee. Reports to the Governor are generated by the Drought Response Committee whenever there is a change in drought stage and throughout Drought Alert and Drought Emergencies stages.

Ongoing Monitoring

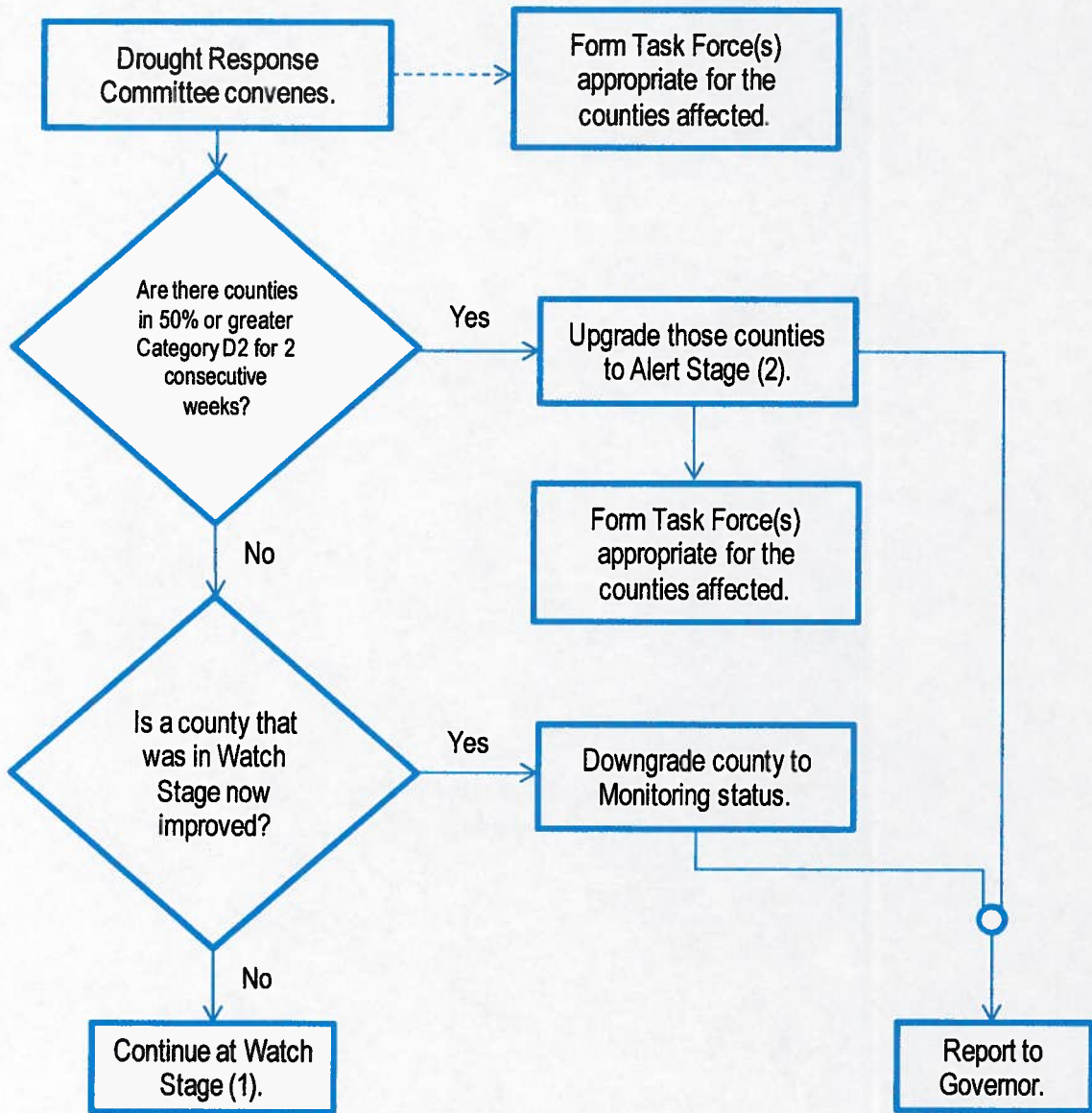


3.1 Drought Watch Stage

The Drought Watch Stage (Stage #1) begins when 50% or more of a county is classified as D1 (drought – moderate) in the Drought Monitor. During the Drought Watch Stage, the Drought Response Committee will assemble to monitor conditions within the area. The Drought Response Committee will monitor trends and serve as sources of technical information for state and local decision-makers, as well as for the public and media. The Drought Response Committee is composed of the directors (or their designees) of the State Climate Office, the Division of Water Resources, and the Division of Emergency Management. The chair of the Drought Response Committee will be the director of the State Climate Office.

Drought Impact Task Forces are *ad hoc* groups formed by the Drought Response Committee to act as experts in the drought affected region, serve as liaisons to local or federal government and provide information needed for dissemination to decision-makers and stakeholders. Task Forces may be expanded or restricted as needed to suit the needs of the situation. Multiple small Task Forces (coordinated through the Drought Response Committee) may be more effective than a single large Task Force. This formation is optional at the Drought Watch stage, but is likely to be necessary at the Drought Alert Stage.

1. Drought Watch Stage

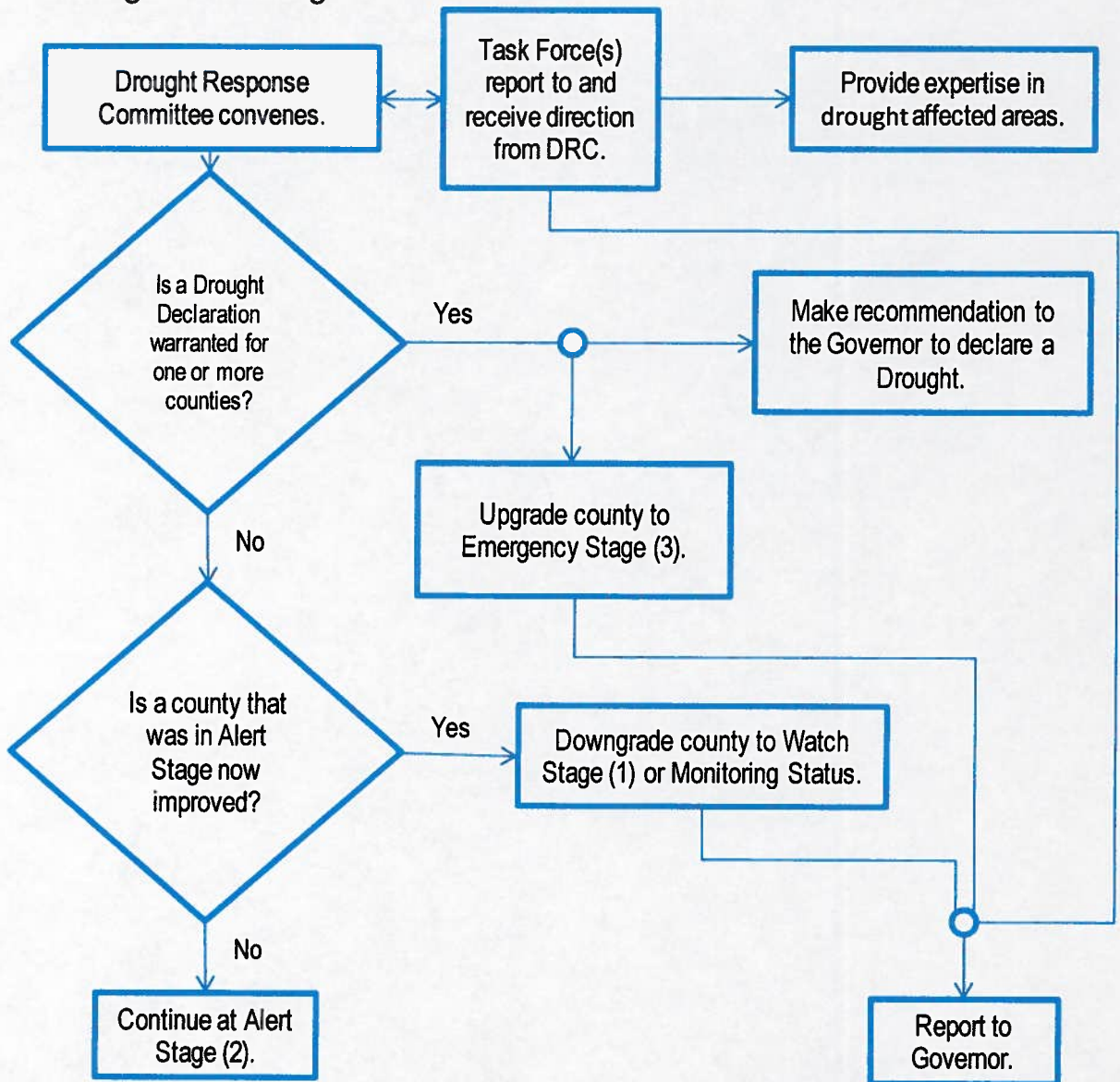


3.2 Drought Alert Stage

The Drought Alert Stage (Stage #2) occurs when 50% or more of a county is classified as D2 (drought – severe) or higher in the Drought Monitor for a minimum of two weeks. The Drought Response Committee will appoint the appropriate Task Force(s), on an *ad hoc* basis, in this stage. Task Force members must be able to speak for their agencies or organizations and have authority to make reasonable commitments toward effective cooperation and coordination. A Task Force may assess actual and projected impacts on the state’s economy, agriculture and/or fish and wildlife resources in the area impacted by the drought. The chair of a Task Force will report regularly to the Drought Response Committee with details concerning the drought extent, magnitude and impacts and will provide information about drought mitigation measures being taken by public agencies or private individuals or organizations.

The Drought Response Committee will monitor the progress of Task Forces, and evaluate the adequacy of data collection, procedures, and reports. Further, the Drought Response Committee will collate information from individual Task Forces in order to develop its own assessments, projections and trends. The Drought Response Committee will oversee intergovernmental coordination, including federal agency actions, and make timely reports on the status of the drought and response activities to the Governor, other state leaders, the media and the public.

2. Drought Alert Stage



3.3 Drought Emergency Stage

The Drought Emergency Stage (Stage #3) begins after the Drought Alert Stage. This stage begins when the Drought Response Committee makes a recommendation, based on information from the Task Force(s) and other sources, that a drought should be formally declared for affected counties. The Drought Response Committee determines whether a critical situation exists or when it becomes obvious that existing state resources and strategies are insufficient to deal with the growing problems and needs. Upon making the recommendation, the Drought Response Committee alerts the Governor that identified portions of the state are experiencing a Drought Emergency.

The issue of whether to formally declare a drought is both controversial and important. The State of Nevada will approach formal declaration with caution. Formal designation may not substantially reduce economic impacts in drought affected areas but may cause serious economic impacts on tourism, agriculture, finance and other industries within the state. Unless a drought situation is expected to be of extreme magnitude, the safest approach is to aid county and local governments in determining their own situations. In many cases existing networks and processes of public agencies, water system managers and experts are available to assess and address particular needs. The criteria for such a recommendation is not as rigidly defined as it is for earlier stages, since the need is dictated by local and specific conditions and based on reporting and recommendations of the Drought Response Committee and Task Force(s). The declaration of a Drought Emergency signifies that conditions are present that may produce negative impacts in certain counties or regions. The Drought declaration may be a trigger point for federal resources. If the drought conditions persist to an extraordinary level, it may negatively impact a county to the point that it exhausts local resources available to respond to the emergency, the affected county may elect to execute a disaster declaration.

In the Drought Emergency Stage, the Drought Response Committee prepares a press release for the Governor. The Governor then may activate the State Emergency Operations Center (SEOC). The SEOC will be overseen by the Chief of the Division of Emergency Management (or designee) and will coordinate with the director (or their designees) of the Nevada State Climate Office and the State Engineer of the Nevada Division of Water Resources as lead responsible agencies, so that continuity of response efforts is maintained.

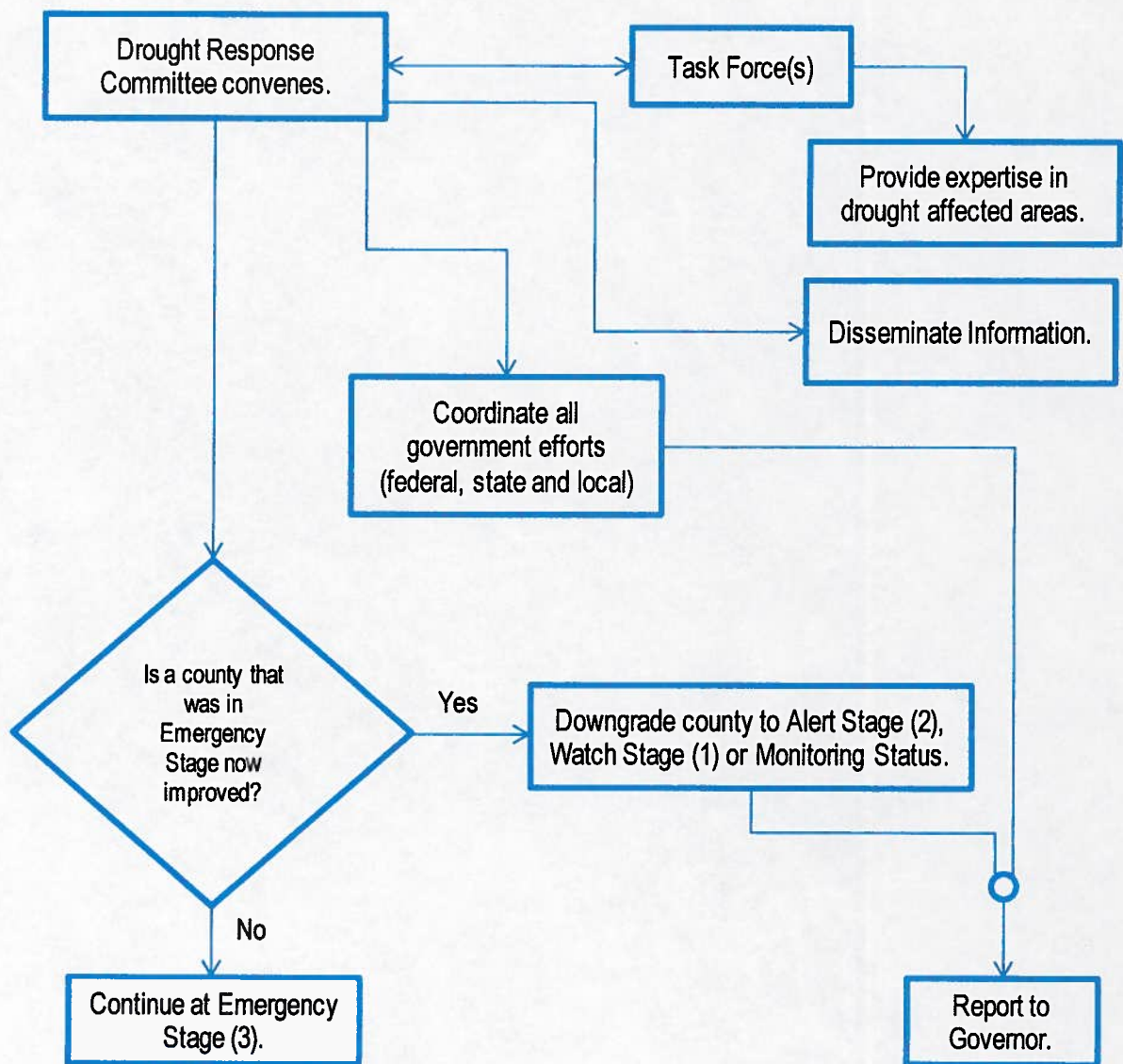
Under a Drought Emergency declaration the Division of Emergency Management, acting in its authority in accordance with Nevada Revised Statute (NRS) 414 and the State Comprehensive Emergency Management Plan (SCEMP), will coordinate state response efforts and make mitigation, response and recovery recommendations to affected counties. The Division of Emergency Management coordinates the state's resources through the SEOC to support local drought emergency response efforts and to carry out the Governor's policies. The Division of Emergency Management may also request support and resources from federal agencies such as the U.S. Department of Agriculture, Bureau of Reclamation and Federal Emergency Management Agency and from non-governmental organizations, such as the American Red Cross, as needed based on the drought conditions and needs of the local jurisdictions.

Upon activation, the SEOC assumes a number of drought related responsibilities, including interagency and intergovernmental coordination and media relations. The SEOC reviews recommendations to address unmet needs from the Drought Response Committee and Task Forces and develops strategies to coordinate the delivery of resources through state mutual aid, state agencies, federal agencies and non-governmental organizations. During the Drought Emergency stage, the SEOC directs the initiatives of the Drought Response Committee and Task Force(s). The Drought Response Committee will continue assessment activities and will provide advice and support to the SEOC, making drought response policy recommendations as needed through the duration of the drought. During the Drought Emergency Stage, Tasks Force(s) will provide recommendations on possible mitigation solutions along with their assessments of the situation both to the Drought Response Committee and to the SEOC.

The SEOC provides general policy direction and as appropriate makes policy recommendations to the Governor for his disposition (such as emergency funding requests and suggested legislative action). The SEOC may advise the Governor on the use of his emergency powers, including any requested data to support the Governor's request, if necessary, for a Secretarial or Presidential Disaster Declaration. The Governor sets the state's priorities, drought mitigation, response and recovery policy and resource allocation direction based on information and recommendations given to the Governor by the Drought Response Committee and the needs of the affected local jurisdiction, county or tribe. The Governor engages with the state

legislature when new authority and funding are necessary. If needs exceed the resources of the State, the Governor may request Federal Disaster Assistance. Federal assistance that does not need state action should be implemented when necessary without going through the Center.

3. Drought Emergency Stage



3.4 End of Drought

As the drought subsides and the emergency passes, if continuing assistance requirements can be met within normal state administrative channels, the Center prepares a press release for the Governor to declare the end to the drought emergency. Prior to disbanding, the Center will prepare and issue a final report on its activities to the Governor. When the Center disbands, the Drought Response Committee again assumes primary responsibility for response activities and for interagency and intergovernmental coordination until all counties of the state are out of the drought alert and drought watch stages. Before disbanding, the Drought Response Committee will prepare and issue a final report to the Governor and appropriate agencies.

4. Local Planning for Droughts

The state encourages local agencies and organizations to prepare for droughts, develop drought plans and to share information about drought preparation and planning. Local drought plans may provide strategic or operational responses to droughts. Other plans may be designed to identify proactive measures that may minimize drought and its consequences.

NRS § 540.141 requires that a water conservation plan, which must be adopted under NRS § 540.131 by a supplier of water as defined under NRS § 540.121, have a provision relating to a contingency plan for drought that ensures a supply of potable water. NRS § 704.662 requires that a public utility furnish a water conservation plan to the Public Utilities Commission, and NRS § 704.6622 requires that such a plan must include a provision relating to a contingency plan for drought that ensures a supply of potable water.