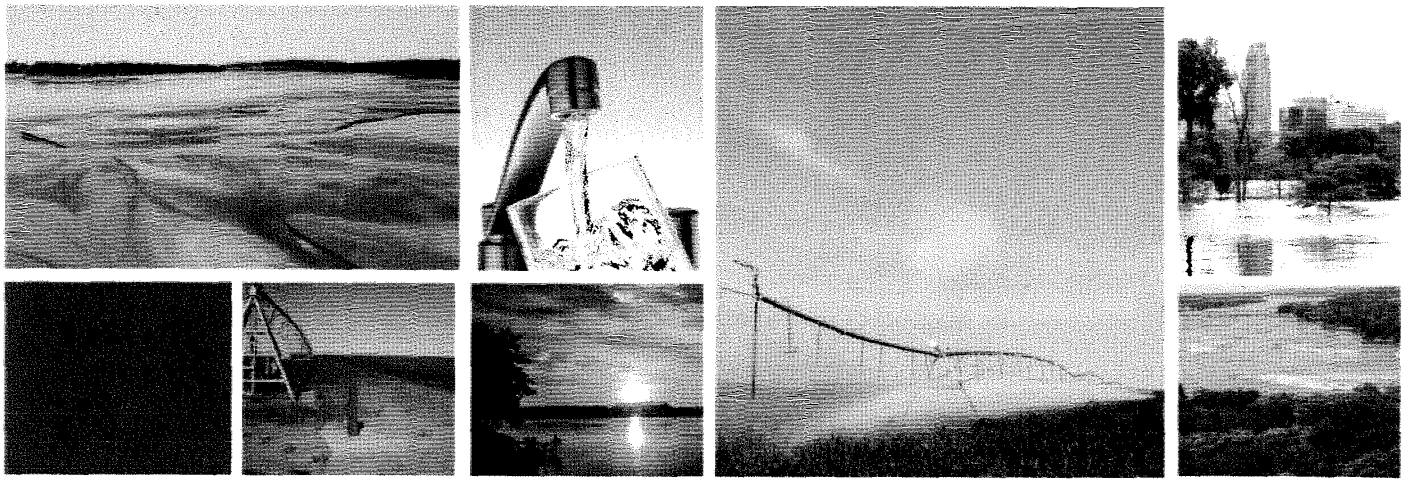

Lower Platte River Drought Contingency Plan

April 11, 2016

Lower Platte South Natural Resources District

Papio-Missouri River Natural Resources District Omaha, NE

Lower Platte North Natural Resources District

Nebraska Department of Natural Resources

City of Lincoln Nebraska

Metropolitan Utilities District

Funding Opportunity Announcement No. R16-FOA-DO-005
WaterSMART: Drought Contingency Planning
Grants for Fiscal Year 2016
Department of the Interior
Bureau of Reclamation

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TECHNICAL PROPOSAL

1.0 EXECUTIVE SUMMARY

The Lower Platte River Consortium (Consortium), comprised of the Nebraska Department of Natural Resources (NeDNR), the Lower Platte South Natural Resources District, the Lower Platte North Natural Resources District, the Papio-Missouri River Natural Resources District, Lincoln Water System (LWS), and Metropolitan Utilities District (MUD) is embarking on this effort to develop a drought contingency plan for the Lower Platte River in Nebraska (Plan). These six water management agencies have organized the Lower Platte River Consortium and through an Inter-local Cooperative Agreement (ILCA) these agencies will to work together to develop regional solutions to improve the water supply reliability and drought resiliency of the Lower Platte River area.

The drought-driven risks are diverse and the alternatives for resolving them will be developed through this planning effort. The Lower Platte River serves approximately eighty percent of Nebraska's population, thousands of businesses and industries, over two million irrigated acres, and provides streamflows for threatened and endangered species. Advanced planning for drought extremes is critical to avoid a number of the water-related risks identified in this proposal.

The Consortium will provide critical coordination between state and local water managers while also assisting with public outreach as the plan is developed and implemented over an eighteen month period with estimated completion in February 2018. By taking a multiagency regional approach to drought contingency planning, the Consortium will be able to enhance water supply reliability, leverage existing infrastructure investments, facilitate water transfers during critical shortages, and improve the areas resiliency to future droughts.

Project Name: Lower Platte River Drought Contingency Plan
Applicant Name: Nebraska Department of Natural Resources
Applicant Address: 301 Centennial Mall South, Lincoln, NE 68509-4676
Applicant Project Manager: Jennifer Schellpeper
Project Manager Email: Jennifer.schellpeper@nebraska.gov
Project Manager Phone: 402-471-2366
Project Manager Fax: 402-471-2900

Bureau of Reclamation Projects in the Project Area:

North Loup Division

Platte River Recovery and Implementation Program

Congressional Districts in the Project Area:
1, 2, and 3

2.0 BACKGROUND DATA

The Lower Platte River is a key source of water supply for over eighty percent of Nebraska's population, thousands of businesses and industries, and over two million irrigated acres. Streamflows of the Lower Platte River also support habitat for threatened and endangered species. Advanced planning for drought extremes is critical to avoid a number of the water-related risks. **Figure 1** illustrates the location of many of these key features.

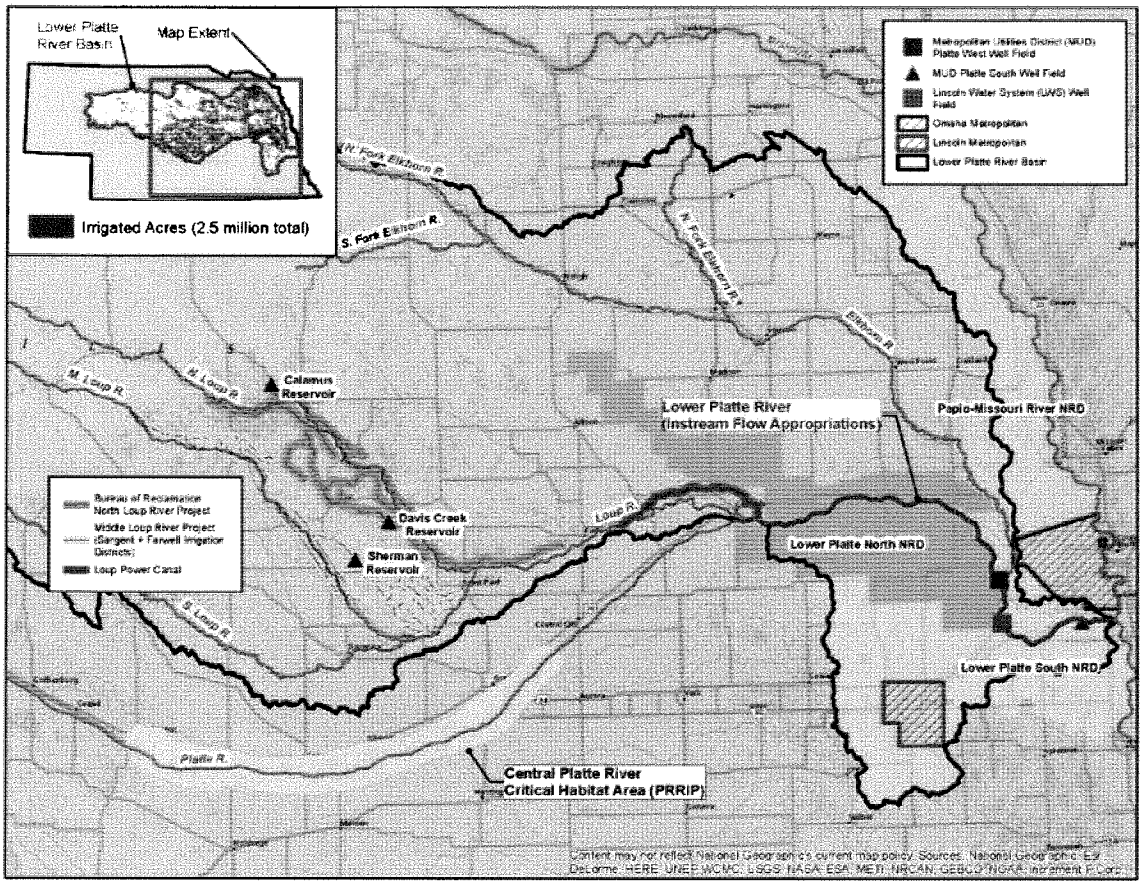

Figure 1. Map of Lower Platte River Drought Contingency Planning Area

2.1 Water Supplies

The water supplies of the Lower Platte River rely significantly on inflows from the Central Platte River, the Loup River, and Elkhorn River. The water supplies of the Loup River and Elkhorn River basins tend to be more reliable due to more significant baseflow contributions. During drought periods these upstream water supplies are placed under significant stress in support of irrigated agricultural production (primarily corn and soybeans). Water supplies of the Lower Platte River can be highly variable with annual flows ranging from two million acre-feet per year to over ten million acre-feet per year. Additionally, more recent indications show this variability is becoming more extreme in association with greater extremes in the intensity and duration of precipitation events in the basin and associated climate change.

While annual water supplies in the Lower Platte River generally tend to be supportive of most water uses, peak demands in the summer months can create **water shortages**, as shown in **Figure 2**. These shortages are further exacerbated by drought periods when summer flows become the most critical in supporting water demands.

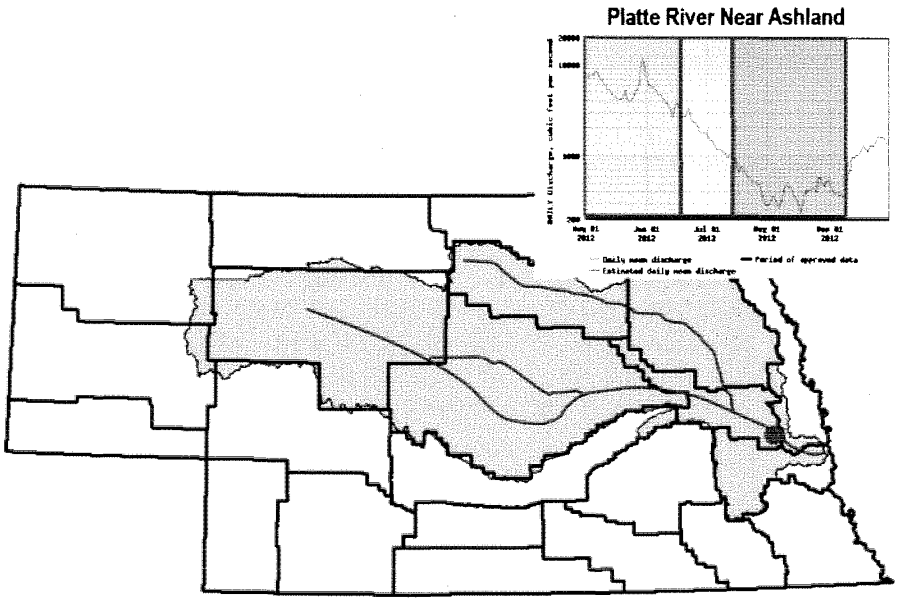

Figure 2. Streamflow data for the Lower Platte River near Ashland, NE. The figure illustrates the precipitous drop-off in streamflow in 2012 as the area experienced the hottest and driest year on record.

2.2 Water Demands and Uses

The water demands and uses in the Lower Platte River are diverse. They include: municipal/domestic, agriculture, instream flows, and hydropower. The water utilities for the municipalities of Omaha and Lincoln serve the two primary metropolitan areas in Nebraska, constituting approximately 50 percent of Nebraska's population. Both municipalities hold induced recharge permits (permits that require streamflows adjacent to their wellfields) and municipal groundwater transfer permits. The Nebraska Game and Parks Commission holds instream flow appropriations for much of the Platte River

and specifically in the areas of municipal well field operations. The Loup Public Power District holds a hydropower appropriation for off-channel hydro-electric power generation. In addition, thousands of individual water rights are held to support irrigation from both surface water and hydrologically connected groundwater sources. **Table 1** provides a more complete listing.

Table 1. List of key water rights and water demands in the Lower Platte River Basin.

Water Right Holder	Appropriation Type	Grant Amount
Metropolitan Utilities District, Omaha	Induced Recharge	1,000 cfs Population: 600,000
Metropolitan Utilities District, Omaha	Induced Recharge	500 cfs Population: 600,000
Lincoln Water System, Lincoln	Induced Recharge	704 cfs Population: 265,000
Metropolitan Utilities District, Omaha	Municipal Transfer	60 MGD limitation
Metropolitan Utilities District, Omaha	Municipal Transfer	100 MGD limitation
Lincoln Water System, Lincoln	Municipal Transfer	110 MGD limitation
Nebraska Game and Parks Commission	Instream Flow Protection at the Platte River/Missouri River confluence	3,100 – 3,700 cfs
North Loup Division (USBR)	Irrigation	53,000 acres
Sargent/Farwell Irrigation Districts	Irrigation	67,000 acres
Loup Public Power District	Hydropower	3,500 cfs
Total irrigation in the Lower Platte River Basin	Both surface water and ground water sources	Greater than 2,000,000 acres

2.3 Water Supply Risks

Key water supply risks are associated with municipal water supplies for the Omaha/Lincoln wellfields located adjacent to the Lower Platte River. In the last 13 years, water use restrictions have been implemented nearly 40 percent of the time in response to low flows in the Lower Platte River during drought conditions. Two years (2002,2012) were mandatory restrictions, while voluntary water use restrictions were employed in three years (2003, 2004, 2005). As a further illustration of the risks posed, **Figure 3** relates the projected demand to the river flow-dependent pumping capacity of Lincoln wellfield. During periods of prolonged low streamflow in the Lower Platte River, the projected water demand for Lincoln could exceed the 60- to 90-day pumping capacity as early as 2018 depending on the magnitude and duration of a drought. In 2018, a supply deficit would be anticipated to occur during extreme drought conditions that correlate to the 50- to 100-year reoccurrence interval event. By 2025, a supply deficit would be anticipated to occur during more frequent drought events, such as the 20-year reoccurrence interval event. There is also a projected supply deficit with the instantaneous and short-term pumping capacity of the well field, where it is projected that the well field may not be able to meet the maximum day demand as early as 2022 during times when the 1-day streamflow is less than the 50- to 100-year reoccurrence interval drought. In addition to water quantity stresses on these wellfields, previous

droughts have provided indications that the well fields may become more vulnerable to water quality issues during these periods of prolonged drought.

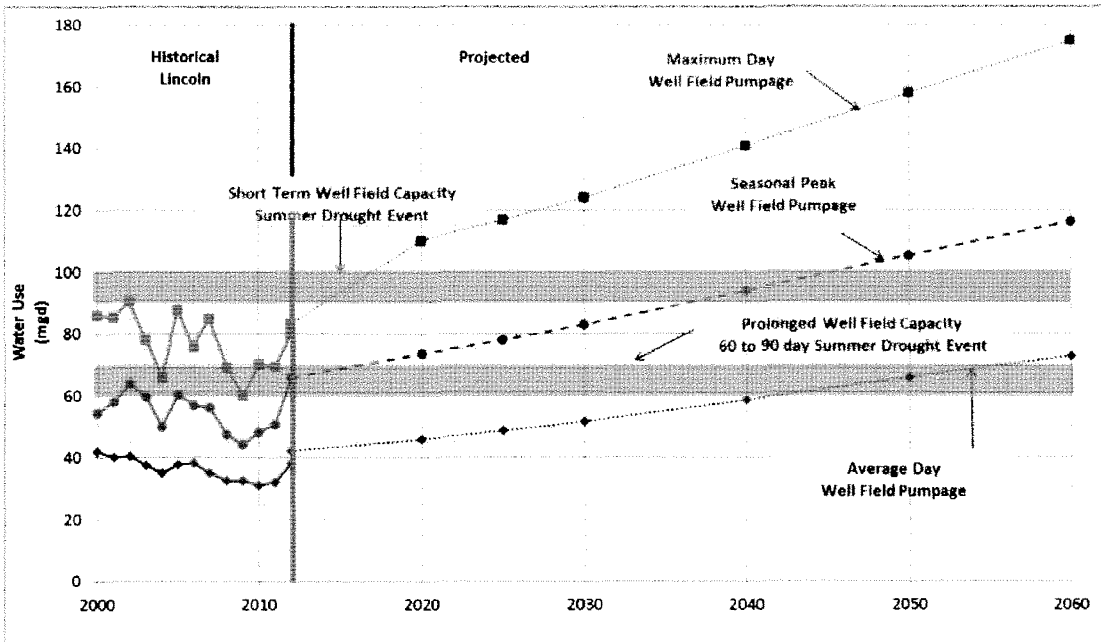

Figure 3. Projection of gap in municipal supplies during drought conditions

In addition to municipal water supply risks, one of the mitigation actions available to Omaha/Lincoln during periods of drought is to exercise a priority call on the Lower Platte River. This would impact hundreds of upstream junior irrigation appropriations and likely during peak irrigation demand periods. This disruption to irrigation supplies would leave many of those junior irrigation uses vulnerable to crop losses.

Streamflows that support threatened and endangered species also can become vulnerable during these drought periods and many of the mitigation and response actions that may be identified through this planning effort would likely improve drought habitat for these species.

2.4 Previous Working Relationships with the Bureau of Reclamation

The NeDNR has successfully worked with the United States Bureau of Reclamation (USBR) on previous efforts in Nebraska. Specifically, NeDNR has worked with USBR under the WaterSMART Basin Studies Initiative in the Niobrara River Basin (currently in review) and Republican River Basin (published March, 2016). Both of these efforts were successful in identifying and evaluating various alternatives that may be available to balance water supplies with water demands as well as assessing potential vulnerabilities that may exist under a range of climate change scenarios.

In addition to efforts through the Basin Studies Program, NeDNR has and continues to work with USBR and the United States Fish and Wildlife Service through implementation of the Platte River Recovery and Implementation Program (PRRIP).

This Department of Interior initiative is an interstate agreement with key governance members from Colorado, Wyoming, Nebraska, the United States Fish and Wildlife Service, and USBR. The goals of the PRRIP are aimed at supporting the recovery of endangered species in the Central Platte while also ensuring the Lower Platte River, downstream habitat for the pallid sturgeon, is not negatively impacted.

The planning area associated with the Lower Platte River Drought Contingency Plan also contains USBR facilities. The North Loup Division is located in the Loup River Basin which is an important tributary to the Lower Platte River providing a high percentage of the baseflow that sustains Lower Platte River flows during drought conditions. The North Loup Division could potentially benefit, both directly and indirectly through diversifying its water supply portfolio in support of the Consortium's goals.

3.0 TECHNICAL PROJECT DESCRIPTION

The Consortium is embarking on this study to develop a drought contingency plan for the Lower Platte River in Nebraska. The six water management agencies that comprise the Consortium will to work together to develop regional solutions to improve the water supply reliability and drought resiliency of the Lower Platte River area. The following sections describe how each of the required six elements of a drought contingency plan will be addressed. The primary focus of the Lower Platte River Plan will be to further refine the Consortium's collective understanding of vulnerabilities, develop more robust monitoring and forecasting tools coupled with timely triggers, new mitigation strategies and responsive actions, and create a sound operational framework to improve critical water supply needs of the area.

3.1 Drought Monitoring

Drought monitoring will be based on key hydrologic factors used to establish a baseline for water supply conditions and provide ongoing drought condition information used to trigger response actions. The Consortium will work to develop forecasting tools and key triggers that incorporate this existing hydrologic data as well as review potential improvements that may be needed to improve predictions and the timing of response actions. These predictions will work to build off of tools developed by the National Drought Mitigation Center.

Quantification of the surface water and groundwater resources will be reviewed to develop a thorough understanding of the key hydrologic factors that determine when drought conditions are beginning and the severity of ongoing drought conditions. The Consortium has previously developed a number of key datasets that will be utilized through this planning effort to develop forecasting tools and triggers. This list includes:

- Groundwater and surface water data in support of water management efforts within the Loup River, Elkhorn River, and Platte River Basins.
- Existing numerical models which encompass the basin and provide an understanding of the underlying hydrogeology and its connection to the surface water.
- Hydropower facilities (Loup Power District), canals, their operations, and their impact on the water resources in the basin.
- Specific knowledge and understanding of significant water users and their impact on basin water resources and opportunities for conjunctive management.
- A preliminary assessment of likely data sources and models required/available is provided in **Table 2**.

Table 2. Data sources and models that will be utilized in development of the Plan

Description of Data	Source	Data Type/Use
Groundwater elevation data (seasonal, monthly, daily, sub-daily)	MUD, USGS, NRDs, USACE (Mead site)	Assess connectivity of surface water and alluvial aquifer by comparing surface and groundwater hydrograph responses to pulse flows
Surface water discharge and stage data for Loup, Elkhorn, and Platte Rivers; and tributaries	USGS, NDNR, MUD pre-design study (HDR, 1993)	Evaluate and characterize reach gain/losses; assess stage correlation
Stream bed K and conductance for Loup, Elkhorn, and Platte Rivers; and tributaries	MUD, UNL, USACE (Mead site), journal articles (e.g., Cheng et al., 2011)	Assess connectivity of surface water and alluvial aquifer
Hydrogeology and characterization of surface/groundwater interaction	ELM, CENEB, LPNNRD, MUD, COHYST and Lower Platte River groundwater models; AEM depth slices; saturated thickness estimates; CSD cross-sections	Assess connectivity of surface water and alluvial aquifer; correlate to spatial variations in aquifer; estimates of conveyance losses from calibrated groundwater models
DNR water administration records for the previous 20 years	DNR Fully Appropriated Basin Report, water administration records	Evaluate historic administration of surface water on the Platte, Loup, and Elkhorn Rivers
Information on influent and effluent from the Mead site to Wahoo or Clear Creeks and pumping from extraction/containment wells.	USACE	Evaluate as potential source of water for augmenting flows in the Lower Platte River
Daily, annual, and seasonal reach gain/loss estimates	DNR excess flow evaluation (HDR, 2013)	Estimates of reach gain/loss for developing routing tool to be used in analyses
Geomorphic, hydraulic, and stage change trends of the Lower Platte River	PRRIP (HDR, 2009), Loup Power District relicensing (HDR, ongoing)	Extensive information on current hydraulic and geomorphic conditions as well as trends in the Lower Platte for evaluating potential projects and sensitivity to future trends
Hydrologic trends in the Lower Platte River	LWS (HDR, 2013); Loup Power District relicensing (HDR, ongoing)	Extensive information on current hydrologic conditions as well as trends in Lower Platte flows for evaluating potential projects and sensitivity to future trends
Spatial and temporal estimates of available excess flows	DNR excess flow evaluation (HDR, 2013); Lower Platte Basin Study (HDR, 2016)	Estimates of timing and quantities of excess flows along the Lower Platte, Loup, and Elkhorn Rivers that could be utilized by potential projects
Potential Conjunctive Management project sites	Lower Platte Basin study (HDR, 2016)	Baseline evaluations of potential projects and benefits for augmenting flows in the Lower Platte River
CropSIM State-Wide Watershed Model data	DNR (TFG, ongoing)	Estimates of runoff from tributary watersheds for potential projects.
Well field operations	HDR modeling analyses for MUD (ongoing) and LWS (HDR, 2013)	Evaluate operational elements of the wellfield (estimates of recharge, drawdowns, and operational thresholds).

Hydrologic data will be utilized to develop an empirical routing tool that will be used to estimate conveyance losses and timeliness of triggers for responsive actions. The routing tool will be developed to simulate losses on a reach by reach basis - defined by existing gage locations – and will incorporate necessary constraints (intervening water users, peak evaporative loss periods, etc.). Surface water gaging data will be the primary driver in initially estimating stream flow gains and losses by reach (RGL). Temporal trends in RGL (monthly, seasonal, annual, etc.) will be determined with the empirical routing tool, and potential correlations (wet/dry year, river stage, etc.) will be investigated to enhance tool performance. Hydrogeologic information and surface/groundwater interaction characterized in the identified data sources will be used to refine the routing tool, specifically to inform spatial variability of reach losses and to characterize the potential errors and qualitative level of uncertainty.

Once constructed, the tool will be verified using data from observed runoff events of comparable magnitude to the anticipated project flows. In addition, the Platte River reaches below the Loup River confluence may be verified using the daily releases from the hydrocycling of the Loup Power District project. In addition to verifying model performance, this effort will inform the Consortium of key data gaps, and the sensitivity of results to those key data elements, thus allowing for targeted future improvements in data collection to support drought monitoring.

3.2 Vulnerability Assessment

A vulnerability assessment will be performed through the development of the Consortium's Plan. An assessment of the risks to critical water resources for the region and the factors contributing to those risks will be evaluated. Many of the Plan participants have previously developed water supply and demand projections for the future under a range of conditions. These projections will also be reviewed with newly available climate change information to further expand the range of vulnerabilities that may exist under future drought conditions. The Plan will assess the water supply reliability needs and vulnerabilities under these various hydrologic conditions and water shortage scenarios as well as key interactions between the Lower Platte River and significant upstream tributary areas.

3.3 Mitigation Actions

The Consortium's Plan will identify, evaluate, and prioritize mitigation actions and activities that work to build long-term resiliency to drought and mitigate the risks posed by future droughts. Mitigation measures that are expected to be reviewed through the planning process include:

- Development of new supplies through repurposed reservoir storage, new reservoir storage, and groundwater augmentation;
- Assessment of conjunctive use opportunities through coordination and agreements with upstream irrigation districts (Figure 4);
- Development of markets, exchanges, and water sharing agreements to reduce demands during drought periods;
- Water conservation and water use reduction.

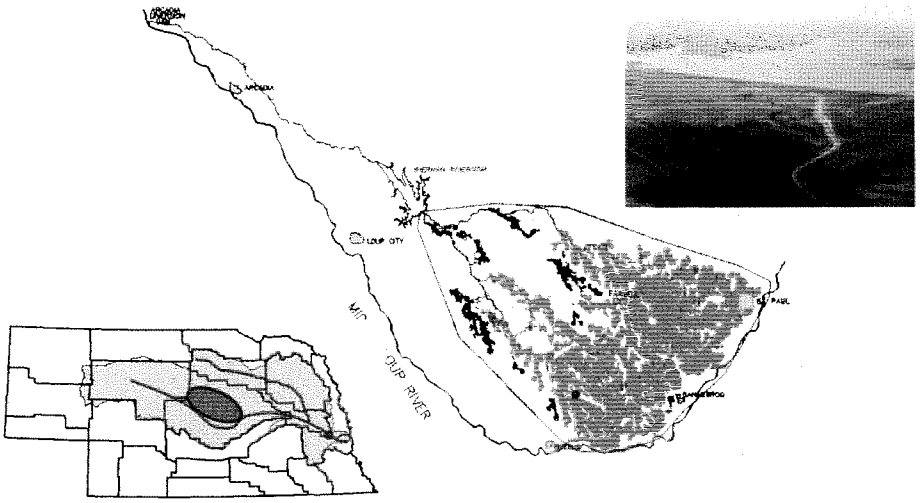

Figure 4. Existing upstream irrigation district infrastructure within the Loup River Basin will be reviewed for its potential to support conjunctive use.

The aim of these mitigation actions will be to decrease future vulnerabilities and reduce the need for critical response actions during drought. Each of these mitigation strategies will be assessed for likely benefits as well as evaluating the associated legal constraints, inclusive of permitting requirements, environmental constraints, third party impacts, and cost of implementation. Additionally, the Plan will include the specific roles and responsibilities of each member of the Consortium in dissemination of public information prior to and during drought conditions to raise awareness of the need for effective mitigation strategies.

3.4 Response Actions

The Consortium's Plan will identify, evaluate, and prioritize response actions and activities that can be implemented quickly during a drought. These response actions will be evaluated for their effectiveness during specific stages of a drought as a means to manage limited supplies and decrease the severity of impacts. The assessment of response actions will include timeframes required to implement the action and the likely conveyance benefits that may result from actions in upstream tributary areas. Potential scenarios that will be evaluated include:

- Surplus water supplies held in storage in three locations in the basin through new storage or repurposing of existing storage;
- Streamflows generated by retiming canal recharges in the Middle Loup Subbasin;
- Streamflows generated by reduced alluvial groundwater pumping;
- Streamflows generated by groundwater augmentation pumping;
- Alluvial aquifer recharge by sandpit storage;
- Call on the river to administer surface water rights.

These measures will be evaluated for how responsive they are in alleviating water supply shortages during drought periods. Additional actions related to administrative actions, such as water administration and increased mandates for water conservation will also be reviewed for their effectiveness in responding to the specific drought needs identified in the Plan.

These response actions will be assessed for constraints that may exist due to the reliability and temporal variability in available water supplies, physical limitations on infrastructure capacity, and maximum delivery rates, as well as the likely range of benefits that would be derived through conveyance of each management action under a range of streamflow conditions. For each responsive action, an assessment of conveyance will be determined based on the empirically derived model that will support drought monitoring. This approach will allow for scenario testing to develop a matrix of predicted streamflow rates and aquifer storage productivity that will serve to set operational objectives aimed at achieving the necessary targets to avoid critical trigger levels. Additionally, this analysis may identify areas where increased monitoring of river and aquifer conditions is required.

Once a full assessment has been completed to determine the likely streamflow benefits associated with action, the Consortium will focus on evaluating the associated legal constraints, inclusive of likely permitting requirements, environmental constraints, third party impacts, and cost of implementation.

3.5 Operational and Administrative Framework

The operational and administrative framework for monitoring, and potential mitigation and response measures will be identified and evaluated as part of the Lower Platte River Drought Contingency Plan. The operational, institutional and regulatory limitations associated with planning, implementing and operating each of the mitigation and response measures will be evaluated through this planning effort. The Consortium's multiagency regional approach will enable it to most efficiently enhance water supply reliability and improve the Lower Platte River areas resiliency to future droughts. The operational framework will ensure that clear roles are established for continuous drought monitoring, development and implementation of mitigation measures, initiation of response actions, including emergency response actions, and updates to the Plan.

3.6 Plan Update Process

The Consortium will develop a schedule for Plan updates and will work to integrate this schedule with other existing planning efforts. **Table 3** below shows the various planning efforts of the group and the update and review schedules associated with each plan.

Table 3. Previous water planning and drought planning efforts of Consortium members.

Name of Plan	Most Recent Review/Update	Frequency of Reviews
State of Nebraska Drought Mitigation and Response Plan	2000	Annual Meeting
Lower Platte South Natural Resources District Integrated Management Plan	2015	Annual Review
Lower Platte North Natural Resources District Integrated Management Plan	2016	Annual Review
Papio-Missouri River Natural Resources District Integrated Management Plan	2015	Annual Review
Lower Platte River Basin-Wide Plan	2016	Annual Review
Lincoln Water System Facilities Master Plan	2014	Periodic
Metropolitan Utilities District Water Alert Emergency Plan	2002	Periodic

Additionally, the Plan will describe responsibilities of the Consortium members in maintaining key drought planning data and monitoring drought conditions as the Plan is implemented.

4.0 EVALUATION CRITERIA

4.1 Evaluation Criterion A – Need for a Drought Contingency Plan or Plan Update

Severity of Risks to Water Supplies

Municipal Demands

Omaha and Lincoln, Nebraska's two largest municipalities, rely heavily on water supplies in the Lower Platte River to support well-field operations adjacent to the river. Lincoln Water System updated its Water Management Plan in 2013. This plan manages water use to maintain consumption within the system's production, pumping, and delivery capacities. When water use cannot be maintained within the system's capacity, the plan defines procedures and provides guidance for imposing water restrictions. The plan includes phases for management of the City of Lincoln's water supplies through various circumstances, including drought conditions or other catastrophic events that would result in a water shortage.

The extent to which drought restrictions are implemented is primarily based on the flows in the Lower Platte River and water usage. Watering restrictions are implemented through the City of Lincoln's Municipal Code. The various phases of watering restrictions start as voluntary and then increase to mandatory as the severity of the drought increases. Tiered water shortage rates are applied during periods when Water Management Plan restrictions are implemented. The water shortage rates were developed on the basis that customers practicing conservation techniques would see little or no increase in their summer water bills. The water shortage rates begin with the voluntary restrictions and are increased if stricter plan phases are enacted. In the last 13 years, water use restrictions have been implemented nearly 40 percent of the time in response to low flows in the Lower Platte River during drought conditions. Two years (2002,2012) were mandatory restrictions, while voluntary water use restrictions were employed in three years (2003, 2004, 2005).

Key water supply risks are associated with prolonged low streamflow in the Lower Platte River, as shown in **Table 4**. The projected water demand for Lincoln could exceed the 60- to 90-day pumping capacity of its well field as early as 2018, depending on the magnitude and duration of a drought. In 2018, a supply deficit would be anticipated to occur during extreme drought conditions that correlate to the 50- to 100-year reoccurrence interval event. By 2025, a supply deficit would be anticipated to occur during more frequent drought events, such as the 20-year reoccurrence interval event. There is also a projected supply deficit with the instantaneous and short-term pumping capacity of the well field, where it is projected that the well field may not be able to meet the maximum day demand as early as 2022 during times when the 1-day streamflow is less than the 50- to 100-year reoccurrence interval drought. In addition to water quantity stresses on these wellfields, previous droughts have provided indications that the well fields may become more vulnerable to water quality issues during these periods of prolonged drought.

Table 4. Projected water supply deficits under potential future drought conditions.

Description	Time Period	Supply Deficit	Year of First Occurrence
Short-Term	2014-2025	20 MGD Instantaneous 10 MGD Prolonged Drought	2018
Intermediate	2026-2040	5 to 15 MGD (by 2040)	2026 to 2032
Long-Term	2041-2060	50 MGD Inst (by 2060) 35 MGD (by 2060) Prolonged Drought	2030 Inst. 2026 Seasonal

Irrigation Demands

In addition to municipal water supply risks, one of the mitigation actions available to Omaha/Lincoln during periods of drought is to exercise a priority call on the Lower Platte River, impacting hundreds of upstream junior irrigation appropriations, likely during peak irrigation demand periods. This disruption to irrigation supplies would leave many of those junior irrigation users vulnerable to crop loss during a prolonged drought. Groundwater irrigation use in areas upstream is also a concern, as those wells can create future lagged depletions to streamflow that may create water supplies that are relatively lower than historically available supplies. Regulation and/or interference with these irrigation demands can be costly should this type of priority call be necessary.

Threatened and Endangered Species

The Lower Platte River Drought Contingency Plan may consider how changes in water management could affect threatened and endangered species (pallid sturgeon, interior least tern, piping plover, salt creek tiger beetle) and their associated habitat in the Lower Platte River. Outcomes could likely be identified that would provide mitigation to species through drought periods, as mitigation and responsive actions to support well-field operations during drought periods will likely be more protective than current conditions.

Water Quality

The Lower Platte River Drought Contingency Plan will consider how changes in water management can impact water quality in the regional supplies. Recent experience indicates that drought conditions that result in significant declines in ground water elevations have the potential to impact water quality; specifically related to iron, manganese and arsenic levels in the water supplies. These water quality impacts can result in the need to modify treatment of the water prior to using it for drinking water purposes.

Existing or Potential Drought Conditions

The state of Nebraska experienced wide-spread drought during 2012 and into 2013, as shown in **Figure 5.** This drought was the result of the hottest and driest year on record in the state. In addition, this drought followed on the heels of an extremely wet period

and the abrupt turn-around in water supply conditions was unprecedented. Water supplies of the Lower Platte River have historically been highly variable, but recent indications are that this variability may be becoming more extreme. These extreme fluctuations necessitate development of additional mitigation measures to prepare for increasing droughts and improvements in response actions and inter-agency coordination during these future droughts to ensure critical water supplies are available.

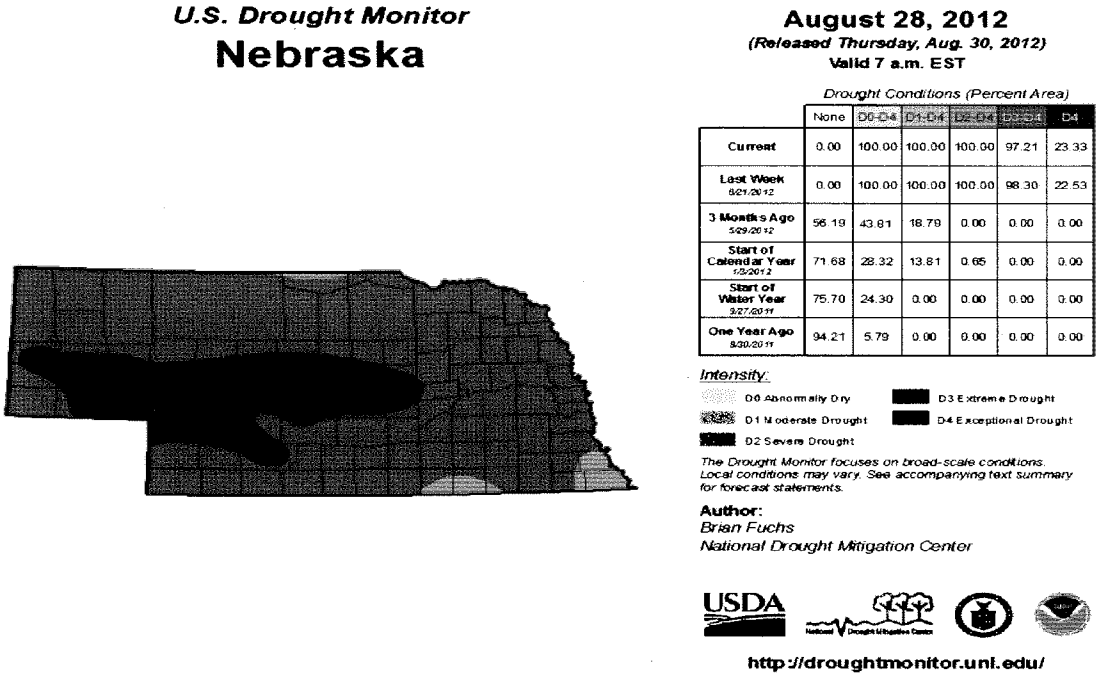

Figure 5. Wide-spread drought impacts during the recent 2012 drought.

Status of Existing Plans

The State of Nebraska's Drought Mitigation and Response Plan (Attachment A) was developed in response to severe droughts and highlighted the need to create continuity between various water administration agencies. The current state drought plan places greater emphasis on mitigating drought impacts and was developed by multiple stakeholders including:

- Nebraska Department of Agriculture;
- Nebraska Department of Natural Resources;
- Nebraska Health and Human Services System;
- Nebraska Emergency Management Agency;
- University of Nebraska Cooperative Extension Service;
- University of Nebraska Conservation and Survey Division;
- Livestock producers, crop producers;
- Governor's Policy Research Office.

Each of the Consortium participants has undertaken planning efforts that have some of the elements of a drought contingency plan already in place. Few agencies have all six required elements combined into one document. **Table 5** below contains a summary of the existing plans each agency has produced to address water management and drought planning, along with the periodic scheduled updates and/or reviews of those plans. The Lower Platte River Drought Contingency Plan will address all six required elements in one document and significantly expand the mitigation and response actions available to the Consortium. The Plan will be different from prior planning efforts, because it will focus on the broader regional framework and collective authorities of the Consortium as opposed to individual agencies as well as integrating all of the required elements into one document.

Table 5. Previous water planning and drought planning efforts of Consortium members.

Name of Plan	Most Recent Review/Update	Frequency of Reviews
State of Nebraska Drought Mitigation and Response Plan	2000	Annual Meeting
Lower Platte South Natural Resources District Integrated Management Plan	2015	Annual Review
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Papio-Missouri River Natural Resources District Integrated Management Plan	2015	Annual Review
Lower Platte River Basin-Wide Plan	2016	Annual Review
Lincoln Water System Facilities Master Plan	2013	Periodic
Metropolitan Utilities District Water Alert Emergency Plan	2002	Periodic

4.2 Evaluation Criterion B – Inclusion of Stakeholders

The primary stakeholders involved in the development of the Lower Platte River Drought Contingency Plan are: the Nebraska Department of Natural Resources (NeDNR), the Lower Platte South Natural Resources District, the Lower Platte North Natural Resources District, the Papio-Missouri River Natural Resources District, Lincoln Water System (LWS), and Metropolitan Utilities District (MUD). Letters of support from these agencies as well as letters of financial commitment are included as part of the grant application package in Attachment B and Attachment C respectively.

Staff from these agencies represent a wide range of constituencies including: municipal/domestic waters, irrigation, environmental, and business and industries. Staff from each agency have been designated to participate in the development of the Plan. These staff have the appropriate expertise to provide background information and review analyses developed as part of the Plan. **Table 6** below lists the staff from each agency that would comprise this initial stakeholder group.

Table 6 List of key stakeholders who will comprise the Lower Platte River Consortium.

Agency	Name of Stakeholder	Title of Stakeholder
Nebraska Department of Natural Resources	Jennifer Schellpeper	Division Head, Integrated Water Management Planning
Lower Platte South Natural Resources District	Glenn Johnson	General Manager
Papio-Missouri River Natural Resources District	Marlin Petermann	Assistant General Manager
Lower Platte North Natural Resources District	John Miyoshi	General Manager
Lincoln Water Supply	Steve Owen	Superintendent for Water Distribution
Metropolitan Utilities District (Omaha)	Joel Christensen	Vice President of Operations

In addition to these listed stakeholders, additional coordinating efforts will be made by the Consortium to engage other key water right holders in the Lower Platte River Basin.

4.3 Evaluation Criterion C - Project Implementation

Work plan

Developing the Lower Platte River Drought Contingency Plan (Plan) will consist of five major tasks, as shown in **Table 7.**

Table 7. Summary of key tasks and milestones in development of the Lower Platte River Drought Contingency Plan.

Tasks	Sub Tasks	Deliverables
Task 100 - Project Administration		
	Execute agreement with Reclamation Establishment of Consortium (Task Force) Grant reporting	Assistance agreement Invoices Semi-annual reports Final report
Task 200 - Review data and develop forecasting and conveyance tools		
	Review and synthesize existing data Develop predictive water conveyance tool Coordinate with stakeholders Identify data collection enhancements	Forecasting tool Conveyance tools Data improvement plan
Task 300 - Review and identify mitigation and response actions		
	Review mitigation strategies Identify response actions Evaluate and prioritize mitigation and response strategies	Workshop #1 Workshop #2
Task 400 - Develop Plan		
	Develop plan elements Stakeholder review/input Finalize plan	Draft Report Workshop #3 Final Report
Task 500 - Public Outreach		
	Public input on draft report Publish report on website(s) Notice public meetings	Fact sheets Website updates

Project administration includes executing the financial assistance agreement with Reclamation, and contracting for consulting services to develop the Plan and grant reporting. The NeDNR will be responsible for project administration tasks under the grant. The deliverables include an executed financial assistance agreement, a consultant contract, and required grant reports. All required reports will be provided to Reclamation consistent with the terms of the financial assistance agreement.

A consultant will work with each of the Consortium participants to develop the elements of the Plan beginning in September 2016. Two workshops will be held among the consultant and the Consortium. The Consortium will provide input on the development of the data and tools that are available and the vulnerability assessment at the first workshop. The results of the mitigation measure analyses and response actions will be presented at the second workshop. The Consortium will provide feedback on the draft report during the third workshop. The final report is anticipated to be completed within eighteen months of project initiation.

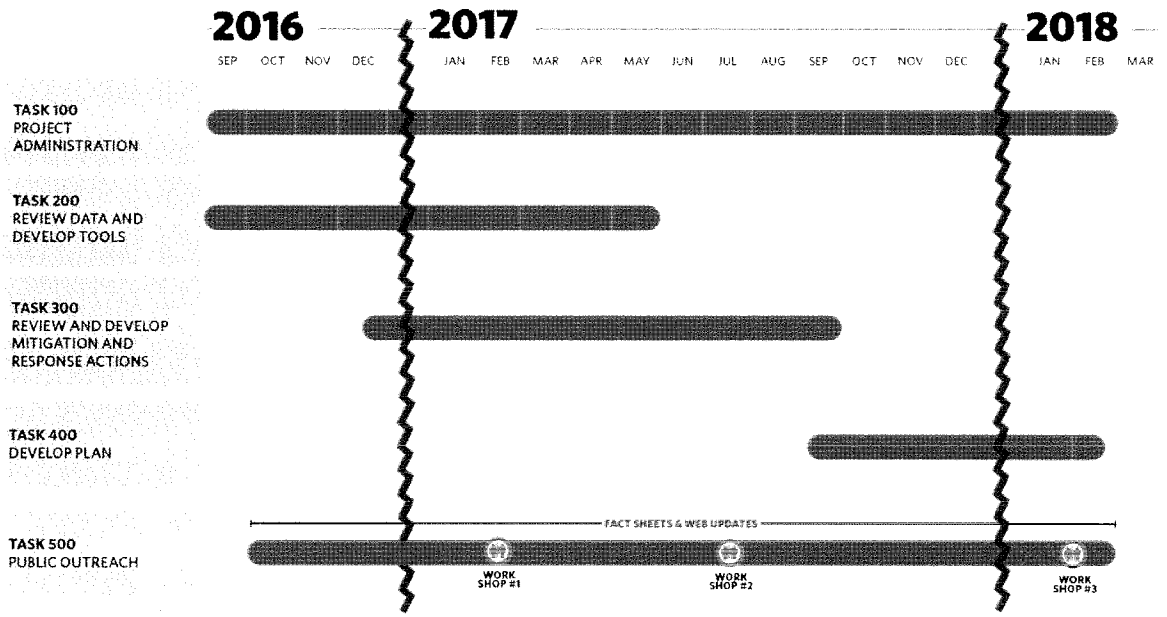
Consortium members will seek comments from the public in order to finalize the draft Plan. Once the Plan has been finalized, the Consortium will promote the final report through various sources such as annual planning meetings and other public meetings. Additional public outreach will include preparation of fact sheets, joint press releases, postings on social media, and other website updates to keep the public informed and provide the opportunity for the public to be informed about the

Plan. The final report will be posted to a public website, as well as be available on each of the agency's websites.

Schedule

The development of the Plan is expected to take eighteen months from the grant award date. It is anticipated that the financial assistance agreement will be executed by September 2016. The consultant has been selected and is available to begin work immediately. The review of data sources, vulnerabilities, and development of forecasting and conveyance tools is expected to commence in the fall of 2016. At the same time, the Consortium will complete preliminary identification and assessment of mitigation and response action. Two separate workshops will be held after this phase, with the expected timeframe for completion of these two elements by Summer 2017. Plan development and review will be conducted through the second half of 2017 with completion of the draft Plan by December 2017. Final review of the Plan will occur in early 2018 with project completion targeted for February 2018. Grant reporting will be ongoing throughout the project duration.

Table 8 Schedule summary and key milestones.



4.4 Evaluation Criterion D - Nexus to Bureau of Reclamation

The planning area associated with the Lower Platte River Drought Contingency Plan contains USBR facilities and project initiatives of the Department of Interior. The North Loup Division is located in the Loup River Basin, which is an important tributary to the Lower Platte River, providing a high percentage of the baseflow that sustains Lower Platte River flows during drought conditions. The North Loup Division could

potentially benefit, both directly and indirectly, through diversifying its water supply portfolio in support of the Consortium's goals.

The Planning area also lies downstream of the Platte River Recovery and Implementation Program (PRRIP). This Department of Interior initiative is an interstate agreement with key governance members from Colorado, Wyoming, Nebraska, the Fish and Wildlife Service, and Bureau of Reclamation. The goals of the PRRIP are aimed at supporting the recovery of endangered species in the Central Platte while also ensuring the Lower Platte River, downstream habitat for pallid sturgeon, is not negatively impacted. The efforts of the Consortium will focus on improving low flow conditions within the Lower Platte River in a manner that does not seek to impact the Central Platte River and should provide additional baseline habitat during drought periods that support the objectives of the PRRIP.

Attachment A: State of Nebraska Drought Mitigation and Response Plan

Nebraska's Climate Assessment Response Committee (CARC)
Drought Mitigation and Response Plan
(Adopted, June 26, 2000)

Background

Drought is a common feature of the Nebraska landscape and often results in significant economic, environmental, and social impacts. Although agriculture is the primary sector affected, impacts on rural and municipal water supplies, fish and wildlife, tourism, recreation, water quality, soil erosion, the incidence of wildland fires, electricity demand, and other sectors are also important. In addition, the indirect impacts of drought on personal and business incomes, tax revenues, unemployment, and other areas are also significant.

Drought differs from other natural hazards in several ways. Drought is a slow-onset, creeping phenomenon and its impacts are largely non-structural. This makes the detection or early warning of drought conditions more difficult than the detection of quick-onset natural hazards that result in more visible, structural impacts. Drought normally affects more people than other natural hazards, and its impacts are spread over a larger geographical area. This makes it more difficult to assess impacts and to provide assistance to drought-stricken areas. Largely because of these distinct characteristics of drought, society in the past has approached drought management through a response or crisis management mode, dealing with the impacts of the event during the post-impact period.

Because of the repeated and widespread occurrence of severe drought throughout the United States in the past two decades and the magnitude and complexity of the associated impacts, there has been a growing trend toward drought planning at the state and other levels of government. Drought planning has been defined as actions taken by individual citizens, industry, government, and others before drought occurs to mitigate impacts and conflicts arising from drought. Planning has been occurring at all levels–from local communities to states and river basins. As of June 2000, thirty states in the United States had drought plans in place and six states were actively pursuing plan development. Recent drought planning efforts have placed greater emphasis on risk management. As a result, mitigation has become the cornerstone of most newly initiated planning activities, and this trend is expected to continue.

Nebraska Drought Planning

The State of Nebraska first adopted a drought plan in 1986 under the leadership of Governor J. Robert Kerrey. This plan, Nebraska's Drought Assessment and Response System (DARS), was developed through cooperation between state and federal agencies and the University of Nebraska. Leadership for this activity was provided by the Natural Resources Commission. In 1988, as a result of the severe drought that affected more than 40% of the nation and much of eastern Nebraska, DARS was

revised to become the Drought Assessment and Response Team (DART) at the request of Governor Kay Orr. The Natural Resources Commission continued to provide leadership for this activity. The objectives of DART remained the same as its predecessor, and it was activated in 1988 to respond to drought conditions in the eastern portion of the state and again in 1989 in response to a statewide drought.

Largely as a result of the experiences in responding to the droughts of 1988-89, the State of Nebraska began to consider ways to improve the effectiveness of the state's drought plan. One of the recognized limitations of DART was that it functioned largely on an "ad hoc" basis with limited authority and little continuity between administrations. In 1991, Legislative Bill 274 was introduced in the 2nd session of the 92nd Legislature. The purpose of this bill was to establish the Climate Assessment Response Committee (CARC) under the leadership of the office of the Governor. LB 274 was passed by the Legislature in 1991 and replaced the functions of DART. As a result of this bill, leadership of CARC shifted to the Governor's office and chairmanship of CARC was transferred to the Nebraska Department of Agriculture. CARC broadened the range of authority to include other potential climate-related natural hazards. However, drought has received most of the attention of CARC since it was created.

The objectives of CARC as defined by LB 274 were to:

1. provide timely and systematic data collection, analysis, and dissemination of information about drought and other severe climate occurrences to the Governor and to other interested persons;

2. provide the Governor and other interested persons with information and advice relevant to requests for federal disaster declarations and to the use of funds and other types of assistance available to the state because of such declarations;

3. establish criteria for start-up and shut-down of various assessment and response activities by state and federal agencies during drought and other climate-related emergencies;

4. provide an organizational structure that assures information flow and defines the duties and responsibilities of all agencies during times of drought and climate-related emergencies;

5. maintain a current inventory of state and federal agency responsibilities in assessing and responding to drought and other climate-related emergencies;

6. provide a mechanism for the improvement of methods of assessing impacts of drought on agriculture and industry;

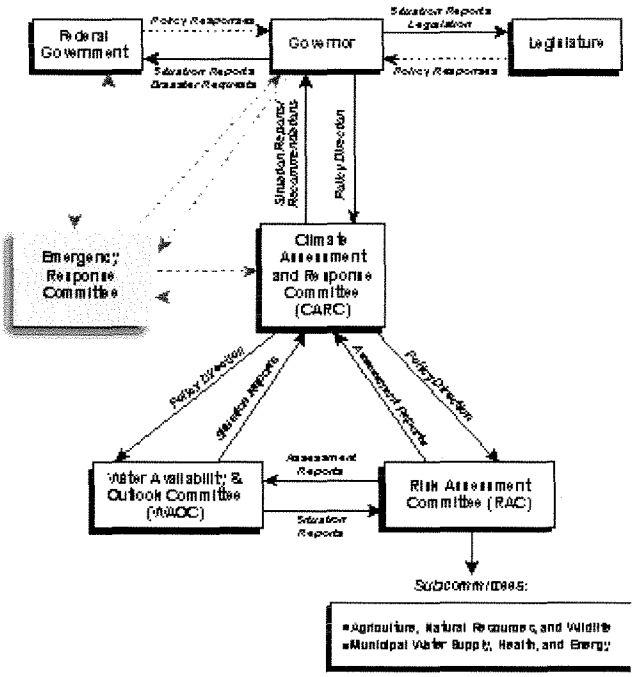
7. provide such other coordination and communication among federal and state agencies as is deemed appropriate by such committee; and

8. perform such other climate-related assessment and response functions as are desired by the Governor.

An organizational structure for CARC was adopted by the committee in 1993. The organizational components of CARC are shown in Figure 1. CARC serves as a steering committee for the state's drought plan and other climate-related activities. The other principal committees associated with CARC are the Water Availability and Outlook Committee (WAOC) and the Risk Assessment Committee (RAC). The Emergency Response Committee (ERC) originally was considered a formal arm of CARC, but its role was revised in June 2000 in response to existing drought conditions and further study of Nebraska state law. By statute, the Nebraska Emergency Management Agency (NEMA) is charged with responding to emergency situations, such as drought or floods, at the direction of the Governor. To avoid any overlap of duties, the ERC's role was folded into the NEMA organization and separated from the official CARC structure.

While not a formal part of CARC, the ERC/NEMA is mentioned in this plan, and shown in the CARC organizational flow chart, to emphasize the importance of information sharing and communication between the two groups, particularly in times of weather emergency.

Figure 1.



Organizational components of Nebraska's Climate Assessment and Response Committee (CARC)

In spring 1998, at the suggestion of the National Drought Mitigation Center (NDMC) at the University of Nebraska, CARC agreed to revise the state's drought plan. This revision process has had the full support of the Governor's office. The goal of this revision process was to derive a plan that would place greater emphasis on mitigation measures to lessen the risk (i.e., impacts) associated with the occurrence of drought and to incorporate new technologies for monitoring drought and water supply conditions that were now available to the committee.

Drought Impacts in Nebraska

Nebraska has experienced numerous drought episodes during the post-settlement period, and evidence from tree rings clearly document the occurrence of severe drought over the past 800 years. Drought produces a complex web of impacts that ripple through many sectors of the economy. This complexity is largely caused by the dependence of so many sectors on water for producing goods and providing services. Impacts from drought are commonly classified as direct or indirect and further separated into economic, environmental, and social categories. The impacts commonly associated with drought have been compiled by the National Drought Mitigation Center and are illustrated in Table 1. Although this list represents the experiences of many drought-prone regions of the world, many of these impacts are common to Nebraska. During the Nebraska drought plan revision process, this list was used to identify those impacts that were most critical to the state.

Many economic impacts occur in broad agricultural and agriculturally related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to obvious losses in yields in both crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and diseases to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn places both human and wildlife populations at higher levels of risk.

Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Reduced income for farmers has a ripple effect, as their ability to purchase goods and services is limited. Thus, many retailers experience significant reductions in sales. This leads to unemployment, increased credit risk for financial institutions, capital shortfalls, and loss of tax revenue for local, state, and federal government. The recreation and tourism industries are also affected because many consumers have less discretionary income available. Prices for food, energy, and other products increase as supplies are reduced. In some cases, local supply shortfalls for certain goods will result in the importation of these goods from outside the stricken region. Reduced water supply impairs the navigability of rivers and results in increased transportation costs because products must be transported by rail or truck. Hydropower production is also significantly reduced. Demand for electricity increases substantially since droughts that occur during the summer season are often associated with above-normal temperature.

Table 1. Classification of drought-related impacts (costs and losses)

Problem Sectors	*Impacts*
Economic	• loss from crop production annual and perennial crop losses; damage to crop quality reduced productivity of cropland (wind erosion, etc.) insect infestation plant disease wildlife damage to crops
	• loss from dairy and livestock production reduced productivity of range land forced reduction of foundation stock closure/limitation of public lands to grazing high cost/unavailability of water for livestock high cost/unavailability of feed for livestock high livestock mortality rates increased predation range fires
	• loss from timber production forest fires tree disease insect infestation impaired productivity of forest land
	• loss from fishery production damage to fish habitat loss of young fish due to decreased flows
	• loss of national economic growth, retardation of economic development
	• income loss for farmers and others directly affected
	• loss of farmers through bankruptcy
	• loss to recreational and tourism industry
	• loss to manufacturers and sellers of recreational equipment
	• increased energy demand and reduced supply because of drought-related power curtailments
	• costs to energy industry and consumers associated with substituting more expensive fuels (oil) for hydroelectric power
	• loss to industries directly dependent on agricultural production (e.g., machinery and fertilizer manufacturers, food processors, etc.)
	• decline in food production/disrupted food supply increase in food prices increased importation of food (higher costs)
	• disruption of water supplies
	• unemployment from drought-related production declines
	• strain on financial institutions (foreclosures, greater credit risks, capital shortfalls, etc.)
	• revenue losses to federal, state, and local governments (from reduced tax base)
	• deterred capital investment, expansion
	• dislocation of businesses
	• revenues to water supply firms revenue shortfalls windfall profits
	• loss from impaired navigability of streams, rivers, and canals

	•	cost of water transport or transfer
	•	cost of new or supplemental water resource development
Environmental	•	damage to animal species reduction and degradation of fish and wildlife habitat lack of feed and drinking water disease increased vulnerability to predation (e.g., from species concentration near water)
	•	loss of biodiversity
	•	wind and water erosion of soils
	•	reservoir and lake drawdown
	•	damage to plant species
	•	water quality effects (e.g., salt concentration, increased water temperatures, pH, dissolved oxygen)
	•	air quality effects (dust, pollutants)
	•	visual and landscape quality (dust, vegetative cover, etc.)
	•	increased fire hazard
	•	estuarine impacts; changes in salinity levels, reduced flushing
Social	•	increased groundwater depletion (mining), land subsidence
	•	loss of wetlands
	•	loss of cultural sites
	•	insect infestation
	•	food shortages (decreased nutritional level, malnutrition, famine)
	•	loss of human life (e.g., food shortages, heat)
	•	public safety from forest and range fires
	•	conflicts between water users, public policy conflicts
	•	increased anxiety
	•	loss of aesthetic values
	•	health-related low flow problems (e.g., diminished sewage flows, increased pollutant concentrations, etc.)
	•	recognition of institutional constraints on water use
	•	inequity in the distribution of drought impacts/relief
	•	decreased quality of life in rural areas
	•	increased poverty
	•	reduced quality of life, changes in lifestyle
	•	social unrest, civil strife
	•	population migration (rural to urban areas)
	•	reevaluation of social values
	•	increased data/information needs, coordination of dissemination activities
	•	loss of confidence in government officials
	•	recreational impacts

Environmental losses are the result of damages to plant and animal species, wildlife habitat, and air and water quality; forest and range fires; degradation of landscape quality; loss of biodiversity; and soil erosion. Some of the effects are short-term and conditions quickly return to normal following the end of the drought. Other

environmental effects linger for some time or may even become permanent. Wildlife habitat, for example, may be degraded through the loss of wetlands, lakes, and vegetation. However, many species will eventually recover from this temporary aberration. The degradation of landscape quality, including increased soil erosion, may lead to a more permanent loss of biological productivity of the landscape. Although environmental losses are difficult to quantify, growing public awareness and concern for environmental quality has forced public officials to focus greater attention and resources on these effects.

Social impacts mainly involve public safety, health, conflicts between water users, reduced quality of life, and inequities in the distribution of impacts and disaster relief. Many of the impacts specified as economic and environmental have social components as well. Population out-migration is a significant problem in many countries as people affected by drought choose to migrate to urban areas either within the stressed areas or to regions outside the drought area. This was certainly a major impact of droughts that occurred in Nebraska during the latter part of the 19th century and the early 20th century, particularly during the 1930s.

Drought Mitigation and Response

Preparedness emphasizes pre-disaster activities designed to increase the level of readiness or improve operational and institutional capabilities to respond to drought in its early stages as well as during the period of peak severity and recovery. Nebraska recognizes that its drought plan must address both the emergency or response element of drought and longer-term issues associated with the reduction of vulnerability and, therefore, risk. Thus, drought mitigation planning is considered to be an ongoing process that the state will need to continue to address in the long term. CARC understands that its role is to provide leadership and coordination in the pursuit of the goal to reduce the impacts of drought in Nebraska while preserving our natural and agricultural resource base for future generations.

The intent of Nebraska's drought plan is to provide government with an organizational structure to systematically address the impacts of drought in a more effective, timely, and coordinated manner. Given the slow-onset nature of drought and the myriad of state and federal agencies and other organizations involved in responding to drought at the state and federal level, this organizational structure and improved coordination is critically important. A drought plan can be an effective means to improve information flow on drought conditions, severity, and impacts, and thus the timeliness of mitigation and emergency response actions.

Nebraska's revised drought plan places more emphasis on mitigation. Mitigation is defined as short- and long-term actions, programs, or policies implemented during and in advance of drought that reduce the degree of risk to human life, property, and productive capacity. The types or forms of mitigation activities vary from one natural hazard to another. Drought-related mitigation actions are, for the most part, different from those used for other natural hazards because of the insidious nature of drought.

Mitigation actions used by states to address impacts during recent droughts in the United States can be classified into nine primary categories, as shown in Table 2. Many of these actions and programs have been and will continue to be considered by Nebraska as part of its ongoing drought planning process.

Assessment programs adopted by states range from improved criteria or triggers for the initiation of specific actions in response to drought to new data collection networks. Automated weather data networks such as the one that exists in Nebraska have significantly improved state monitoring capabilities. One of the three critical components of a drought plan is a comprehensive monitoring/early warning system. Parameters that must be monitored to detect the early onset of drought include temperature and precipitation, stream flow, reservoir and groundwater levels, snow pack, and soil moisture. Each of these parameters represents different components of the hydrologic system and, therefore, different impact sectors (e.g., agriculture, energy, transportation, recreation and tourism). To assess emerging drought conditions, these data must be integrated to provide a comprehensive snapshot of water availability and outlook.

Legislative actions taken by states included the passage of measures to protect instream flows and guarantee low-interest loans to farmers. Low-interest loans, a common federal response to drought, are not generally available from states. Many states have been reexamining aspects of water rights doctrine in response to growing water use and associated conflicts. Water banks have been used in some states (e.g., California) as a means of temporarily modifying water allocation procedures during water shortages.

Augmentation of water supplies during recent droughts included rehabilitating reservoirs to operate at design capacity and reviewing reservoir operation plans. Many cities also worked with self-supplied industrial users on programs to reallocate some water for emergency public water supplies. In the longer term, urban areas have sought to expand the capacity of their water supply system by developing new supplies or through the development of alternative supplies to lessen vulnerability.

One of the key responsibilities of state government during periods of drought is to keep the public aware of the severity of the situation through timely reports. These reports must provide a clear rationale for mitigative actions that are being imposed on either a voluntary or mandatory basis. During recent droughts, some states have organized informational meetings for the media and the public, implemented water conservation awareness programs, prepared and distributed informational materials, and organized workshops on drought-related topics. Sample ordinances on water conservation were also prepared and distributed to municipalities and rural suppliers.

Most states lack the financial resources necessary to provide drought relief to individual citizens during times of emergency. However, it is often within the mission and capacity of state agencies to provide technical assistance to municipalities and others. During recent droughts, states assisted by providing advice on potential new sources of water and evaluating the quality and quantity of those supplies. Agencies also assisted municipalities in assessing the vulnerability of water supply systems. States encouraged the adoption of voluntary water conservation measures and established stronger economic incentives for water conservation within the private sector. Water metering and leak detection programs were implemented.

Emergency response programs would not be considered by some to be mitigative actions. However, if these measures are implemented to reduce immediate impacts or the risk of future impacts as part of a long-term mitigation program, they represent a proactive approach to drought management. State responses included a wide range of measures such as lowering of well intakes on reservoirs for rural water supplies, establishing water hauling programs for livestock, extending boat ramps in recreational areas, and creating a tuition assistance program to enable farmers to participate in farm management classes.

Table 2. Drought-related mitigative actions taken by states during recent droughts

Category	Specific Action
Assessment programs	Developed criteria or triggers for drought-related actions
	Developed early warning system, monitoring program
	Conducted inventories of data availability
	Established new data collection networks
	Monitored vulnerable public water suppliers
Legislation/public policy	Prepared position papers on public policy issues
	Examined water rights statutes for possible modification during water shortages
	Passed legislation to protect instream flows
Water supply augmentation/ development of new supplies	Issued emergency permits for water use
	Provided pumps and pipes for distribution
	Proposed and implemented program to rehabilitate reservoirs to operate at design capacity
	Undertook water supply vulnerability assessments
	Inventoried self-supplied industrial water users for possible use of their supplies for emergency public water supplies
	Inventoried and reviewed reservoir operation plans
Public awareness/ education programs	Organized drought information meetings for the public and the media
	Implemented water conservation awareness programs
	Published and distributed pamphlets to individuals, businesses, and municipalities on water conservation techniques and agricultural drought management strategies
	Organized workshops on special drought-related topics
	Prepared sample ordinances on water conservation for municipalities and domestic rural supplies
Technical assistance on water conservation	Provided advice on potential new sources of water
	Evaluated water quantity and quality from new sources
	Advised water suppliers on assessing vulnerability of existing supply system
	Recommended the adoption of water conservation measures to suppliers
Demand reduction/water conservation programs	Established stronger economic incentives for private investment in water conservation
	Encouraged voluntary water conservation
	Improved water use and conveyance efficiencies
	Implemented water metering and leak detection programs

Emergency response programs	Established alert procedures for water quality problems
	Stockpiled supplies of pumps, pipes, water filters, and other equipment
	Established water hauling programs for livestock from reservoirs and other sources
	Compiled list of locations for livestock watering
	Established hay hotline
	Provided funds for improvement of water systems, developing new systems, and digging of wells
	Provided funds for recovery programs for drought and other natural disasters
	Lowered well intakes on reservoirs for rural water supplies
	Extended boat ramps and docks in recreational areas
Water use conflict resolution	Acted to resolve emerging water use conflicts
	Negotiated with irrigators to gain voluntary restrictions on irrigation in areas where domestic wells were likely to be affected
	Established a water banking program
	Clarified state law regarding sale of water
	Clarified state law on changes in water rights
	Suspended water use permits in watershed with low water levels
	Investigated complaints of irrigation wells interfering with domestic wells
Drought contingency plans	Recommended to water suppliers the development of drought plans
	Established statewide contingency plan
	Evaluated worst-case drought scenarios for possible further actions

Conflicts between water users increase during water-short periods. Timely intervention to resolve these conflicts will become increasingly necessary as demands on limited water supplies continue to expand in number and complexity. The best approach is to anticipate these conflicts well in advance of drought and initiate appropriate actions to avoid conflict. Many of the actions taken focused on the growing conflicts between municipal and agricultural water use.

Nebraska's Drought Mitigation and Response Plan

Recognizing the recurring nature of drought in Nebraska and the potential risks associated with severe drought events that may persist for one or more years, the purpose of the state's drought mitigation efforts are to:

- monitor the state's climate and water supply conditions;
- assess the risks of and vulnerabilities to drought;
- promote the development and implementation of mitigation actions and policies; and

- respond to drought emergencies in a timely and effective manner.

The long-term goal of the plan is to provide Nebraska with an effective and systematic means of assessing drought conditions, develop mitigation actions and programs to reduce risk in advance of drought, and develop response options that minimize economic stress, environmental losses, and social hardships associated with drought. The state's drought planning activity is viewed as an ongoing process in recognition of the dynamic nature of the factors that may alter future vulnerability and risk. The objectives of the Nebraska Drought Mitigation and Response Plan are to:

1. Collect, analyze, and disseminate timely and reliable drought-related data and information in a timely and systematic manner to the Governor and other interested persons;

2. Identify sectors, communities, and population groups most at risk and work with those groups to determine mitigation and response programs to address these risks in advance of drought events;

3. Determine appropriate triggers for the initiation and termination of drought mitigation and response programs;

4. Provide an organizational structure that facilitates interagency cooperation and a delivery system that assures information flow to state and federal agencies and others;

5. Define the duties and responsibilities of state and federal agencies, the University of Nebraska, and others in preparing for and responding to the impacts of drought;

6. Compile and maintain an inventory of state and federal mitigation and response programs that can assist in lessening the impacts of and facilitating the recovery from drought;

7. Develop and maintain an information delivery system, including a CARC web site, to keep the public informed of current drought conditions and potential mitigation and response actions; and

8. Perform other climate-related mitigation, assessment, and response functions as desired by the Governor.

CARC Membership

The membership of CARC is, as defined by Legislative Bill 274, as follows:

- Department of Agriculture
- Department of Natural Resources
- Health and Human Services System, Office of Regulation and Licensure
- Nebraska Emergency Management Agency
- Cooperative Extension Service, University of Nebraska
- Conservation and Survey Division, University of Nebraska

- Livestock producer
- Crop producer
- Governor's Policy Research Office

The Nebraska Department of Agriculture currently serves as chair of CARC.

Additional CARC members can be appointed by the Governor, including:

- Chairpersons, Agriculture and Natural Resources Committees (Nebraska Legislature)
- Representatives from the federal Farm Service Agency and federal Crop Insurance Corporation
- Representatives from any other state or federal agencies he or she deems necessary

Water Availability and Outlook Committee (WAOC)

The purpose of the WAOC is to monitor current climate and water supply conditions and estimate likely future water availability. The State Climatologist of the Nebraska State Climate Office, University of Nebraska-Lincoln, will serve as chair of the WAOC. The objectives of the WAOC are:

1. To work with CARC and RAC to define drought for various applications and develop triggers that will initiate and terminate mitigation and response programs and actions;

2. To inventory current observation networks and make recommendations on the expansion or improvement of those networks;

3. To develop a comprehensive monitoring system for drought that incorporates current and emerging technologies to monitor all principal components of the hydrological system;

4. To identify, in collaboration with CARC and RAC, drought management areas of the state that reflect various levels of vulnerability to drought conditions; and

5. To recommend potential mitigation and response actions to CARC.

Those variables that the WAOC will monitor and evaluate on a routine basis include precipitation and temperature, soil moisture, stream flow, groundwater, reservoir and lake levels, and snow pack for Nebraska and in western states that supply inflow to the Platte and Missouri River systems. The committee will also use other indices such as the Standardized Precipitation Index, Palmer Drought Severity Index, Crop Moisture Index, and Standardized Vegetation Index to assess drought severity levels.

The WAOC will meet at least three times a year: spring, summer, and fall. The committee will report the status of climate and water supply conditions in writing to the chairperson of CARC and at CARC committee meetings.

Membership of the WAOC includes:

State Climatologist, Nebraska State Climate Office, UNL (Chair)
National Drought Mitigation Center, UNL
Conservation and Survey Division, UNL
Cooperative Extension Service, UNL
Department of Natural Resources, State of Nebraska
Natural Resources Conservation Service, USDA
National Weather Service, NOAA
U.S. Geological Survey, DOI
Bureau of Reclamation, DOI

Risk Assessment Committee (RAC)

The purpose of the Risk Assessment Committee (RAC) is to identify those sectors, population groups, or regions most at risk from drought and the most probable impacts. The objectives of this committee are to:

1. Conduct a drought risk assessment for Nebraska;

2. Formulate mitigation and response actions that will reduce these impacts and work with CARC on strategies to implement these actions and programs;

3. Collaborate with WAOC to develop appropriate triggers that link mitigation and response actions to the sequence of drought impacts;

4. Assist WAOC in the development of drought management areas.

The following RAC subcommittees were formed to address these objectives:

- Agriculture, natural resources, and wildlife
- Municipal water supply, health, and energy

The CARC chairperson will appoint co-chairs for these subcommittees. The membership of RAC will include the co-chairs of the subcommittees, a representative from the Nebraska Department of Agriculture, and a member of the NDMC staff. RAC will coordinate the activities of the subcommittees and report on these activities and recommendations to CARC.

The two subcommittees have conducted a risk assessment as the first step in incorporating long-term mitigation into the state's drought planning process. These subcommittees have involved a wide variety of stakeholders. Both subcommittees have prepared a list of impacts, possible mitigation actions to address particular impacts, and potential agencies and organizations to implement these actions. These subcommittees will continue to function to further define and implement mitigation and response programs.

The subcommittees will meet at least three times a year, and possibly more often during droughts or when the subcommittee tasks require more frequent meetings. During droughts, the subcommittees will help assess particular impacts and provide specific recommendations to CARC through RAC for the initiation and termination of mitigation and response actions using predefined triggers.

The list of impacts and suggested mitigation actions for each of the subcommittees is included in Appendix A. A subcommittee membership list is included in Appendix B. The agencies and organizations that have participated in the subcommittee meetings are listed in Appendix A.

Agency and Organization Responsibilities

The following agencies and organizations have an interest in and/or responsibility to deal with drought situations in Nebraska. These groups may have data and information on hand or have the capability to gather and disseminate information that is crucial to effective and timely drought management in Nebraska. Following is a brief outline of each agency's area of expertise, available information, and contact information in the event of a developing or ongoing drought situation.

AGENCIES AND ORGANIZATIONS

State Agencies

NE Department of Agriculture

The Department of Agriculture is responsible for chairing the state's Climate Assessment Response Committee (CARC); therefore, in that role it will serve as facilitator of the drought mitigation efforts of the various federal, state, university, and local entities.

It will enlist the expertise of various meteorological officials to monitor climate conditions. When it becomes apparent that drought conditions could develop or are developing, it will call a timely meeting of CARC and continue to call such meetings as conditions warrant.

The Department will encourage and coordinate the drought mitigation efforts of the various agencies based on CARC recommendations, and/or make other drought mitigation suggestions as it deems necessary.

As the lead state government agency involved in CARC, it will keep the Governor updated on conditions and offer mitigative action suggestions.

The Department will offer drought mitigation ideas regarding agriculture through its various producer networks and/or disseminate information via media contacts. It has access to heat-related animal health information through the State Veterinarian and the Animal and Plant Health Inspection Service and can provide

a variety of crop, livestock, production, and rainfall statistical information through the Nebraska Agricultural Statistics Service.

Contact: Greg Ibach, Assistant Director, P.O. Box 94947, 301 Centennial Mall South, Lincoln, NE 68509- 4947. Phone (402) 471-2341

Health and Human Services System, Office of Regulation and Licensure

Regulation & Licensure will, through data base search and confirmation in the field, develop and maintain a prioritized list of community water systems identified as being potentially at risk to extreme drought conditions. Those systems will be monitored for drought impacts, operational conditions, and drought emergency preparedness. Adjustments to the list will be made as appropriate. Information on drought management techniques and water conservation practices will be provided to water systems, news media, and other entities as necessary, for their use and dissemination to their customers. The Department will, with assistance from organizations representing public water systems in Nebraska, provide area wide informational workshops, and one-on-one contact with those systems potentially at highest risk of drought impact, to strongly encourage and assist in development of adequate drought preparedness procedures.

Contact: Jack Daniel at (402) 471-0510. Email: jack.daniel@hhss.state.ne.us

NE Department of Natural Resources

The agency maintains a data bank that has historical and current information on stream flows, crops, soil, water, well registrations, a dam inventory and weather conditions in the state. They regulate surface water use according to the prior appropriation doctrine and register new wells. Static water levels of groundwater are available through a cooperative program with USGS and CSD. DNR collects information on stream flow, water discharge from major canals, and water discharge from municipalities with transfer permits. The agency has a close working relationship with all irrigation districts and natural resources districts in Nebraska and can help coordinate drought assessment and response activities with those groups. They maintain a close working relationship with adjacent states on surface and groundwater issues and can provide assistance and coordination on a regional basis if necessary. DNR also can assist with data collection, analysis and planning and provide support for CARC as requested. The agency maintains the CARC web site.

Contacts: Roger Patterson, Agency Director, or Steve Soberski, P.O. Box 94676, 301 Centennial Mall South, Lincoln, NE 68506-4676. Roger Patterson Phone (402) 471-2363. Steve Soberski Phone (402) 471-3942

NE Emergency Management Office

The State of Nebraska concept of operations is based upon the understanding that emergency operations functions provided by state-level departments and agencies are generally similar to their normal day-to-day

functions. Day-to-day functions that do not contribute directly to the emergency operation may be redirected for the duration of any emergency or disaster.

Emergency operations will be initiated at the most local level of government capable of responding effectively to the emergency/disaster. Local governments should be prepared to manage initial emergency activities, regardless of the size and scope of the incident. State government resources may not be available in the early stages of an emergency.

When an emergency exceeds the local government's capability to adequately respond, assistance may be requested from state government. Specific state response resources may be contacted for assistance as part of their day-to-day duties or the Governor may be requested to issue a state of emergency proclamation. Issuance of a Governor's state of emergency proclamation will activate the SEOP and shall be the authority for the deployment of any state-level resources described in the SEOP.

State level resources are organized into nine (9) Emergency Support Functions (ESF), including Transportation, Communications, Public Works/Utilities, Fire Suppression, Information Planning, Mass Care, Law Enforcement, Health and Medical, and Urban Search and Rescue. One state department/agency is designated with the responsibility for coordinating planning and response activities of the assigned ESF. Each ESF annex describes a concept of operations and the responsibilities of the departments/agencies that will respond to local government requests.

- All departments/agencies having ESF responsibilities maintain standard operating procedures, including the procedures by which they will be alerted and activated for 24-hour operations if needed.
- Agencies, organizations and individuals assigned responsibilities in this plan will maintain an awareness of those responsibilities and will respond as directed in this plan.
- The NEMA director or his designee serves as the state level incident manager, supervises all emergency/disaster operations and coordinates the emergency support functions of state agencies as described in the SEOP.
- Each department/agency provides resources using its authorities and capabilities, in coordination with other ESF resources, to support its mission(s).
- Each ESF will have a designated department/agency representative (titled Emergency Support Function Coordinator (ESFC)) who will assist the NEMA Response Section Chief in the management of mission assignments, including coordination of task activities. Upon activation, the ESFC will notify ESF departments/agencies that may be called upon to provide emergency assistance.
- All departments/agencies having ESF responsibilities must be aware of their roles and be prepared to take necessary action.

Upon orders of the Governor, a state emergency response team or teams may be deployed to the stricken area(s) to reinforce local emergency management efforts.

If additional assistance is needed beyond state capability, the Governor may submit a request to the President for federal assistance. The Federal Emergency Management Agency (FEMA) will coordinate requests to the proper Federal agencies, as outlined in the Federal Response Plan.

In order to carry out its responsibilities, NEMA maintains an incident management system entitled the NEMA Operations Management System (OMS). OMS is utilized to facilitate the flow of information within the State Emergency Operations Center (SEOC); provide for organized management from the SEOC of multi-agency response to emergencies in Nebraska; and incorporate the principles of the Incident Command System (ICS) to manage response to natural and/or technological disasters. NEMA OMS incorporates the principles of the Incident Command System (ICS) to manage response to natural and/or technological disasters.

Contact: Larry Nedrow, Operations Officer, Nebraska Emergency Management Agency, 1300 Military Road, Lincoln, NE 68508-1090. Phone (402) 471-7414. Email: larry.nedrow@nema.state.ne.us

NE Game and Parks

The Game and Parks Commission serves primarily as a resource to provide technical assistance regarding Nebraska's Fish and Wildlife Resources to state, federal and local government agencies and to private landowners and the general public.

Contact: William (Bill) Baxter, Agricultural Programs Manager, Wildlife Division, Nebraska Game and Parks Commission, 2200 No. 33rd, PO Box 30370, Lincoln, NE 68503. Phone (402) 471-5449. Fax (402) 471-5528. Email: bbaxter@ngpc.state.ne.us

NE Department of Roads

The Department of Roads is charged with "the design, construction, maintenance, operation, and protection of adequate state highway facilities sufficient to meet the present demands as well as future requirements...." (Subsection 39-1301.00, Revised Statues of Nebraska)

NDOR "is authorized to lease, rent, or permit for use, any area, or land and the buildings thereon, which area or land was acquired for highway purposes." (Subsection 39-1323.01, Revised Statutes of Nebraska)

Therefore, NDOR can issue a "LICENSE FOR THE MOWING AND REMOVAL OF HAY FROM DEPARTMENT OF ROADS' RIGHTS-OF-WAY". This permits the haying of highway rights-of-way when the Governor makes an emergency drought declaration.

Contact: Paul M. Cammack, State Maintenance Engineer, P.O. Box 94759, 5001 South 14th Street, Lincoln, NE 68509-4759. Phone (402) 479-4542. Fax (402) 479-3918. Email: pcammack@dor.state.ne.us

NE Department of Environmental Quality

DEQ regularly samples selected surface water bodies to detect sources of contamination and monitor trends.

The DEQ samples wells and surface water bodies in response to complaints or for special studies. If problems are identified, enforcement action may be initiated by the appropriate regulatory program. If groundwater contamination has resulted from non-point sources, DEQ will consider the area for potential study and designation as a Special Protection Area in cooperation with the local Natural Resources Districts.

DEQ issues point source wastewater discharge permits which limit the amount of pollutants discharged into streams.

DEQ has regional offices in North Platte, Omaha, and Chadron with additional offices scheduled to open in Holdrege, Norfolk, and Scottsbluff. Personnel in these offices can respond to emergency situations as they arise.

Contact: Patrick W. Rice, Assistant Director, Water Quality Division, or Thomas R. Lamberson, Deputy Director, Suite 400, The Atrium, 1200 N Street, P.O. Box 98922, Lincoln, NE 68509-8922. Fax (402) 471-2909. Email: Patrick Rice at deq185@mail.deq.state.ne.us or db82731@navix.net; Thomas Lamberson at deq112@mail.deq.state.ne.us

NE Forest Service

The agency coordinates the Aerial Fire Suppression Program and the State's Wildland Fire Danger rating system. They provide low-cost all-wheel drive vehicles to cooperating fire districts in Nebraska through the Federal Excess Property program and administer cost share funding to Nebraska Fire Districts for fire fighting equipment and personal protective clothing through the Volunteer Fire Assistance Program. The agency also provides wild land fire suppression training (in cooperation with the State Fire Marshal's Training Division) and planning and fire prevention assistance for Rural Fire Districts.

Contact: Don Westover, Fire Program Leader, Nebraska Forest Service, 105 Plant Industry Bldg, University of Nebraska, Lincoln, NE 68583-0815. Phone (402) 472-6629. E-mail: dwestover1@unl.edu

NE Fire Marshal's Office

The State Fire Marshal is responsible for maintaining a state of readiness in municipal and volunteer fire departments, and assists in finding maintenance services for emergency equipment.

The agency also assists in locating emergency water supplies to fight fires in the state.

A statewide burning ban is in place, with permits for burning being administered at the local level. In drought situations, when burning may be hazardous, the state office will consult with the local agencies to discuss current conditions and a possible recommendation that permits not be issued until conditions improve.

Contact: Ken Winters, State Fire Marshal, P.O. Box 94677, 246 South 14th Street, Lincoln, NE 68509-4677. Phone (402) 471-2027.

University of Nebraska

UNL Cooperative Extension

The primary mission of Cooperative Extension is the development and delivery of educational programs that impact individuals; their families; their farms, ranches, and businesses; and their communities. Cooperative Extension faculty are located on the University of Nebraska-Lincoln (UNL) East Campus; at Research and Extension Centers located at Clay Center, Norfolk, Lincoln, North Platte and Scottsbluff; and at 83 county or multi-county offices throughout the state. Research-based information and education provided by Cooperative Extension can help people make more informed decisions regarding drought issues. Cooperative Extension can provide information on a broad range of drought related topics, including crop production, livestock production, landscape and lawn water conservation, water conservation in the home, water resources management, and individual and family response to stress. Cooperative Extension faculty represent most of the subject matter disciplines in UNL's Institute of Agriculture and Natural Resources. Information and education programs can be delivered by written publications, meetings, media, and electronically using available technology.

Contacts: Elbert Dickey, Interim Dean and Director, Phone (402) 472-2966, Email: edickey1@unl.edu. DeLynn Hay, Program Leader, Phone (402) 472-2966, Email: DHAY1@unl.edu

UNL National Drought Mitigation Center

The National Drought Mitigation Center at the University of Nebraska-Lincoln helps people and institutions develop and implement measures to reduce societal vulnerability to drought. The NDMC stresses preparation and risk management rather than crisis management. The NDMC will:

- continue to serve in an advisory capacity to CARC in its drought planning process;
- provide the latest information on drought planning, risk assessment, and monitoring techniques;
- serve as members of both the WAOC and RAC committees and provide advice through the RAC subcommittees on mitigation actions and programs; and
- assist in coordinating drought-related activities at the University of Nebraska.

Contact: Donald A. Wilhite, Director, National Drought Mitigation Center, 241 L.W. Chase Hall, University of Nebraska, Lincoln, NE 68583-0749. Phone (402) 472-6707. Fax (402) 472-6614. Email: DWILHITE1@unl.edu

UNL High Plains Climate Center and State Climate Office

The State Climate Office, through a memorandum of understanding with the National Climatic Data Center, is recognized as the official archive for climatic measurements taken within the state of Nebraska. It is the responsibility of the Nebraska State Climate Office to act as a warehouse for climate records, provide expertise with the dissemination of climatic observations, conduct relevant climatic analyses, and ensure timely and accurate summaries of climatic observations.

The Nebraska State Climate Office will provide members of the Climate Assessment and Response Committee with the most current climatic information possible. The timely dissemination of climatic data should ensure that criteria indicating the onset of drought conditions are revealed to interested parties before significant economic impacts are observed. The State Climate Office manager, the Nebraska state climatologist, will chair the Water Availability and Outlook Committee (WAOC) and report the committee's findings directly to the full membership of CARC.

Contact: Allen Dutcher, State Climatologist, High Plains Climate Center, University of Nebraska, 15 L.W. Chase Hall, Lincoln, NE 68583-0728. Phone (402)-472-5206. Fax: (402)-472-8763. Email: adutcher@hpccsun.unl.edu or internet website: http://www.nebraskaclimateoffice.unl.edu

UNL Conservation and Survey Division

The Conservation and Survey Division has a groundwater-level monitoring program that assists the natural resources districts in gathering water-level data. Its full-time water-level monitoring coordinator has helped them and other groups rebuild their water-level monitoring "infrastructure." This has included introducing sophisticated electronic monitoring equipment that saves them time and money.

This water-levels information goes into a data base co-managed by the U.S. Geological Survey and the state Department of Natural Resources (DNR) that can be accessed through the DNR website, with links from the CSD web site. It includes a statewide map of groundwater-level changes since predevelopment and for the past year that can zoom in on local conditions as needed. CSD also publishes the map of changes since predevelopment in hard copy.

The division keeps data from more than 4,700 test holes drilled in every county in the state to assist the understanding of groundwater occurrence and dynamics and in preparing management models of the groundwater geology of specific areas. This drilling has been done in every county in the state.

CSD's water survey personnel respond to requests for information and technical assistance pertaining to groundwater availability (for example, well siting), water-well design, potential yields of wells, and hydraulic properties of aquifers.

To support this effort, CSD maintains extensive files of well records, test hole logs, geotechnical borings, well and aquifer production tests, water quality analyses, and various kinds of reports. The division's researchers

generate computer models of groundwater and surface-water dynamics and of the interaction between the two. Decision makers can use these models to better understand pressure on water resources.

The Center for Advanced Land Management Information Technologies (CALMIT), a joint program of the division and the UNL School of Natural Resource Sciences, has developed an award-winning, seasonally and locally specific data base on vegetative cover and land use that has assumed a global scope, becoming the first such detailed data base. The data base has been used extensively in research on global environmental change, drought monitoring and watershed management, among other applications.

The division, in conjunction with the UNL Department of Geology, has been involved for more than two decades in studies of regional climate change and drought as reflected in the geological history of the Sand Hills and western Nebraska generally. These examinations of past climate patterns are some of the best information available about the implications of possible future climate shifts.

Contact: Mark Kuzila, Director, 113 Nebraska Hall, University of Nebraska-Lincoln, 68588-0517. Phone (402) 472-7537. Email: mkuzila1@unl.edu

Department of Agronomy

Faculty in the Agronomy Department at the University of Nebraska conduct teaching, research and extension in crop physiology, cropping systems, crop genetics and breeding, weed science, soil science, and range and forage sciences. Faculty expertise in the following areas contribute to efficient utilization of water resources in crop and forage production, as well as to mitigation of drought impact: (1) water and soil conservation through minimum- and no-tillage systems, (2) selection of appropriate crop rotations and variety/hybrids for water-limited conditions, (3) range and pasture management to optimize productivity during drought periods, (4) weed management concerns during drought periods, including herbicide effectiveness, (5) soil fertility and fertilizer management under water-limited conditions, (6) life-saving irrigation tactics to maximize water use efficiency in irrigated systems.

Contact: Kenneth G. Cassman, Professor and Head, Department of Agronomy, University of Nebraska, P.O. Box 830915, Lincoln, NE 68583-0915. Phone (402) 472-1555. Fax (402) 472-7094.

Federal Agencies

Farm Service Agency/USDA

Conservation Reserve Program - Emergency Haying and/or Grazing

- The FSA has the authority to grant haying and grazing privileges on cropland placed in the Conservation Reserve Program (CRP). The croplands, which have been removed from agricultural production of annual crops, may be grazed or hayed under a county-by-county emergency drought authorization from the Secretary of Agriculture. The intent is to alleviate a livestock emergency when pasture or forage crop

production has been substantially reduced because of a natural disaster. CRP participants are required to request haying or grazing from the FSA Service Center and pay the costs as determined by the Secretary.

Conservation Reserve Program - Grass Fire Prevention

- The Secretary of Agriculture allows CRP participants to use a controlled burn of the certain CRP acreage to remove excess growth and to establish firebreaks. Participants must receive a fire prevention plan from the local fire department. Participants may receive FSA approval to mow or use shorter grass varieties around building sites to prevent a fire from destroying farmstead sites. FSA will not approve a controlled burn unless the participant has an approved CRP conservation plan from the Natural Resources Conservation Service allowing the burn and a current burn permit from the local fire department. FSA encourages participants to make every effort possible to protect property in case of an actual fire. FSA does not approve controlled burning during the primary nesting season. During long periods of drought, the old CRP grasses are very susceptible to fire and can create an extreme hazard to people, property and wildlife.

Emergency Conservation Program

- FSA administers the Emergency Conservation Program (ECP) which provides cost share funds to farmers with livestock. The purpose is to carry out emergency water conservation and enhancement measures on farmland suffering from severe drought. The measures are used to permit grazing of range, pasture, or forage by livestock and to provide emergency water for confined livestock operations. Some restrictions do apply, and farmers should contact the local FSA Service Center for more details.

Livestock Assistance Program

- The Farm Service Agency administers a Livestock Assistance Program which provides a payment to eligible livestock producers where the producer has suffered a 40 percent or greater grazing loss for at least three consecutive months as a result of damage because of drought, hot weather, disease, insect infestation, flood, fire, hurricane, earthquake, severe storm, or other disasters. The County Committee may request the program be implemented on a part of a county basis. Payment is based on the lesser of the feed allowance for the eligible livestock or the value of the pasture and grazing loss. The statutory authority for the program is Public Law No. 106-78, and it requires appropriated funding; a national factor may be applied to the appropriated funds after a sign up period.

Noninsured Assistance Program

- The Noninsured Assistance Program (NAP) is designed to reduce financial losses that occur when natural disasters cause a catastrophic loss of production or prevented planting of an eligibile crop by providing coverage equivalent to CAT insurance. Statute limits NAP to each commercial crop or agricultural commodity, except livestock, for which CAT is not available and is produced for food or fiber.

Crop Loss Disaster Assistance Program

- The Secretary of Agriculture will make disaster payments under disaster programs available to certain producers who have incurred losses in quantity or quality of their crops due to disasters. Producers will

be able to receive benefits under this part for losses to eligible crops as determined by the Secretary. Crop disaster programs are available when authorized by Congress.

Emergency Loan Assistance

- FSA provides low-interest Emergency (EM) loan assistance to eligible farmers and ranchers to help cover production and physical losses in counties declared as disaster areas by the President or designated by the Secretary of Agriculture. The FSA administrator may also authorize EM loan assistance to cover physical losses only. Farmers and ranchers that operate in counties contiguous to a disaster-designated county may also be eligible for EM loan assistance. EM loan assistance is only available to family-size farm or ranch operations. Applicants must provide evidence the loan being requested is not available from other sources.

Direct and Guaranteed Farm Operating Loans and Guaranteed Farm Ownership Loans

- FSA makes and guarantees loans to family-size farmers and ranchers who are temporarily unable to obtain private commercial credit. Operating loans may be used to purchase livestock, farm equipment, feed, seed, fuel, and other farm operating expenses and also refinance farm operating debts. Guaranteed Farm Ownership Loans may be used to refinance real estate type debts.

Disaster Set-Aside Program

- The Disaster Set-Aside (DSA) Program is available to existing FSA Farm Loan Program (FLP) borrowers, who suffered losses as a result of a natural disaster. Borrowers who are current or not more than one installment behind on any FLP loan may be permitted to move the scheduled annual installment for each eligible FLP load to the end of the loan term. The intent of the program is to relieve some of the immediate financial stress caused by the disaster.

Contact: Mark J. Wilke or Doy Unzicker, Nebraska State FSA Office, P.O. Box 57975, Lincoln, NE 68505-7975. Phone (402) 437-5581.

Risk Management Agency/USDA

RMA, through private insurance companies, provides a means for farmers to insure their operations to mitigate a loss of income when disasters, such as drought and other perils, damage their crops. The USDA subsidizes the insurance premiums for the policy the farmer chooses to cover the crops grown. RMA provides 5 different insurance plans for 15 crops which are commonly grown in Nebraska.

Contact: Clarence E. Manning, 3401 SW Van Buren, Topeka, KS 66611-2227. Email: rsoks@rm.fcic.usda.gov or www.rma.usda.gov

Natural Resources Conservation Service/USDA

The NRCS has 10 field soil scientists that are collecting soil moisture samples near the 16 climatological stations located throughout Nebraska. This sampling is used to check the calibration of the instrumentation at these

sites. These samples measure the moisture in the soils that is available to the plant. These measurements are then related to the field capacity (the point at which the soil is saturated) and the wilting point (the point at which the plants are in stress due to low soil moisture levels). The samples are taken at the surface, at 10", 20", and 40".

The NRCS also works with farmers and ranchers by designing and installing conservation systems such as reduced tillage, terraces, and buffer systems that improve soil quality and enhance the ability of the soil to store water.

Contact: State Soil Scientist, USDA-Natural Resources Conservation Service, 100 Centennial Mall North, Lincoln, NE 68502. Phone (402) 437-4113.

US Geological Survey/DOI

USGS can provide stream flow data and statistical analyses from approximately 85 gaging stations around the state. Real-time stream flow data is available at website: http://www.ne.cr.usgs.gov.

USGS has water-level records from over 80 continuous-recording wells and also periodically monitors water levels or receives water-level readings from other agencies to store in a water-level data base from thousands of other wells across the state.

USGS can provide water-quality data from various stream flow sites and numerous ground-water wells.

USGS has hydrologic models developed for some areas that can be used to estimate stream flow and groundwater levels under hypothetical drought conditions.

Contact: Glenn B. Engel, Room 406, Federal Building, U.S. Court House, 100 Centennial Mall North, Lincoln, NE 68508. Phone (402) 437-5082. Email: gbengel@usgs.gov

Bureau of Reclamation/DOI

The Bureau of Reclamation (Reclamation) coordinates drought assistance and mitigation funding through Public Law 102-250 by providing drought contingency planning and specific limited construction funding to areas impacted by a drought. These funds are contingent upon Congressional authorization, and after the Commissioner of Reclamation accepts a request from the state for drought assistance. The projects must also meet the guidelines established under the law.

Reclamation's Great Plains Region hosted a drought contingency planning workshop in the fall of 2000. This workshop was intended for local, state, and tribal agencies and provided drought planning tools and processes. Participants increased their ability to identify opportunities to improve planning, mitigation and responses to drought.

Reclamation operates a network of automated hydrologic and meteorologic monitoring stations located throughout the 17 western states. The Hydromet System collects remote field data from reservoirs, river gages, and canals, and transmits it via satellite to provide real-time water management capability. Reclamation's AgriMet System is a satellite-linked, weather and evapotranspiration reporting network used to assist irrigators in scheduling irrigation applications. Reclamation also provides water supply forecasts for Reclamation projects in the form of Annual Operating Plans and Monthly Water Supply Reports.

Reclamation's Water Conservation Program helps agencies develop and coordinate water conservation programs, contingency plans for drought-induced water shortages, and voluntary water transfers. Through Reclamation's Water Conservation Field Services Program (WCFSP), Reclamation works with municipalities, irrigation districts, tribes, and other local, state, and federal agencies to lessen the effects of drought through water conservation planning and implementation. The WCFSP is designed to provide technical and financial assistance with water management planning, conservation education, demonstration of innovative technologies, and implementation of conservation measures. By conserving existing water supplies through efficient management or by developing new water supplies where needed, the potential effects of drought are reduced and mitigation needs are diminished.

Contacts: Jack Wergin, Bureau of Reclamation, Nebraska-Kansas Area Office, P.O. Box 1607, 203 West 2nd, Grand Island, NE 68802-1607. Phone (308) 389-4622, x202. Fax (308) 389-4780. Email: jwergin@gp.usbr.gov. Rick DeVore, Great Plains Regional Drought Coordinator, Bureau of Reclamation P.O. Box 36900, Billings, MT 59107-6900. Phone (406) 247-7757. Fax (406) 247-7793. Email: rdevore@gp.usbr.gov. Roseann Gonzales, Reclamation Drought Coordinator, Bureau of Reclamation, D-5010, P.O. Box 25007, Denver, CO 80225-0007. Phone (303) 445-2787. Fax (303) 445-6693. Email: rgonzales@do.usbr.gov

National Weather Service/NOAA/DOC

The National Weather Service provides weather and flood forecasts and warnings to protect life and property. The day-to-day forecasts extend out to 7 days with more generalized outlooks extending out to 13 months.

The National Weather Service coordinates programs with state, local, and federal agencies involved with meteorology and hydrology to attain maximum cost effectiveness.

The National Weather Service works closely with the mass media as the chief means of communicating weather and flood warnings and forecasts to the public.

Nebraska is served by six National Weather Service Forecast Offices, three within the state and three outside the state. They are located at Valley, Hastings, and North Platte in Nebraska, and Goodland KS, Cheyenne WY, and Sioux Falls SD outside the state.

Contact: Dave Theophilus, Meteorologist in Charge, National Weather Service, PO Box 719, Valley, NE 68064-0719. Phone (402) 359-5166, ext 642

Corps of Engineers/DOD

The U.S. Army Corps of Engineers is authorized to supplement state and local authorities in providing emergency supplies of drinking water to any locality confronted by drought or with a source of contaminated drinking water causing or likely to cause a substantial threat to public health and welfare. The Governor or his authorized representative must request the assistance from the Corps. The request should outline the impact and resources committed by state and local governments to combat the situation. State and local authorities must commit all available resources prior to requesting federal assistance. During a drought event, the Assistant Secretary of the Army must declare the area a "drought distressed area" before federal emergency water assistance can be provided.

The forms of assistance are as follows: technical assistance to state and local officials for identification of any and all options to restore the source of water supply; transportation of emergency supplies of drinking water and limited well drilling when commercial firms are unable to provide water in a timely manner. Assistance is normally limited to 30 days for contaminated water sources.

Contacts: Jack D. Rose, Chief, Emergency Management, Omaha District. Phone (402) 221-4148. Fax (402) 221-4257. Marjorie DeBrot, Chief, Emergency Management, Kansas City District. Phone (816) 983-3535. Fax (816) 426-6138.

Other Agencies and Organizations

NE Association of Resource Districts

Natural Resources Districts (NRDs) are local political subdivisions charged with properly conserving and developing the state's natural resources. The activities of NRDs include the management of surface water and groundwater resources, the construction and operation of flood control structures, and the administration of land management plans to prevent soil erosion and sediment problems. NRDs also work with municipal and domestic water supplies to protect the quality and quantity of water for the citizens of the state. The Nebraska Association of Resources Districts is a statewide association created by NRDs to provide administrative services, legislative representation, statewide communication and coordination of the 23 independent districts.

Contact: Dean E. Edson, Executive Director, 601 South 12th, Suite 201, Lincoln, NE 68508. Phone (402) 471-7674. Email: dedson@alltel.net

League of Municipalities

The League of Nebraska Municipalities is an association whose members are Nebraska cities and villages. Information from state agencies regarding drought conditions and effects can be provided to city and

village officials through League publications, newsletters and mailings.

Contact: Lash Chaffin, Utilities Section Director, League of Nebraska Municipalities, 1335 L Street, Lincoln, NE 68508. Phone (402) 476-2829. Email: lashc@lonm.org

Appendix A

See attached subcommittee matrices

Appendix B

See attached subcommittee membership lists

Appendix C

CARC members, year 2000

Greg Ibach, chair, Department of Agriculture
Barbara Cooksley, livestock producer
Elbert Dickey, Cooperative Extension, UN-L
Merwin Fricke, crop producer
Stanley Heng, Emergency Management
Mark Kuzila, Conservation and Survey, UN-L
Richard Nelson, Health and Human Services, Regulation and Licensure
Roger Patterson, Department of Natural Resources
Dave Vogler, Governor's Policy Research Office
Don Wilhite, National Drought Mitigation Center
Dayle Williamson, Department of Natural Resources

Appendix A
Nebraska Risk Assessment Committee
Nebraska Agricultural, Natural Resources, and Wildlife Subcommittee
Planned Mitigation Actions

IMPACT	PLANNED ACTIONS	ASSISTANCE AGENCIES
Reduced range and pasture forage and livestock water results in poor animal health, soil erosion, and possible economic loss to ranchers	1. Encourage the use of range and pasture management techniques such as reduced stocking rates, reserve pastures, rotational grazing, removing competitive plants and stored feed to improve sustainability of rangelands under drought conditions.	National Grassland Association, Nebraska Cattlemen, UNL Extension, NRCS, NRDs, Sandhills Cattle Association
	2. Prior to and during drought, use public information programs and on-site visits to emphasize importance of rangeland management and planning to equalize stocking rates with available forage and the need for permanent water storage and distribution systems.	UNL Extension, NRDs, NEDA, DNR, NRCS, NDMC
	3. Monitor forage supplies and conditions around the state and facilitate information exchange between interested parties. A) If conditions warrant, a meeting of a forage advisory committee will be organized early in the spring to determine haystock availability, forage conditions, and wildlife concerns. B) Also, at that meeting, the procedure for emergency roadside haying through the Department of Roads could be discussed to determine need and value of this procedure. C) Also, at that meeting, it could be determined if a letter to the federal office of FSA is warranted to forewarn them of drought conditions and impending requests for CRP emergency release; this group would pass that recommendation on to CARC, who would then pass the request for the letter on to the Governor and the Director of Agriculture.	UNL Extension, NRDs, NEDA, NRCS, DNR, NDMC, FSA, Nebraska Cattlemen, Farm Bureau, Alfalfa Association, Nebraska Department of Roads
	4. Investigate needs of economically stressed ranchers who now rely on federal and state grazing leases to sustain their herds. Develop a coordinated plan of action to be taken by land management agencies to provide grazing and/or supplemental feed assistance to lessees. Investigate changing federal and state grazing regulations during drought.	Nebraska Forest Service, BLM, US Fish and Wildlife, Nature Conservancy
	5. Assist ranchers in obtaining supplemental income by connecting them with employment opportunities, and during drought, by holding job fairs and raising general awareness of job opportunities and ranchers' work skills.	Nebraska Department of Labor, NEDA, UNL Extension, NRDs, Center for Rural Development

IMPACT	PLANNED ACTIONS	ASSISTANCE AGENCIES
	6. Explore alternatives for establishing state funded cost-share program for water conservation measures on rangeland.	DNR
	7. Establish and activate a statewide and nationwide hotline system for locating economical feedstock sources.	NEDA, UNL Extension, Nebraska Cattlemen, National Guard, Farm Bureau, NEMA, NRDs, NRCS, Alfalfa Association
	8. Explore/create incentive program for long-term conservation grazing practices.	NEDA, UNL Extension, NE Cattlemen
	9. Develop indemnity plan crop insurance for grazing land/livestock operations.	NEDA
Reduced soil moisture on dry cropland poses economic loss to farmers and possible increased soil erosion and blowing dust	1. Evaluate effectiveness of crop insurance and suggest changes.	Crop Insurance Groups
	2. Use public information programs to emphasize installation of soil and water conservation systems (i.e, terraces, crop residue use, and contour planting).	NRCS, SARE, DEQ, UNL Extension, NRDs
	3. Emphasize additional measures regarding crop residue management, grassing terraces and emergency tillage to control soil blowing.	NRCS, SARE, DEQ, UNL Extension, NRDs
	4. Investigate use of rainfall enhancement projects in targeted areas.	NEDA, DNR, NRDs
	5. Investigate and promote alternative crops and drought-resistant seeds for drought-prone areas of the state.	UNL Agronomy
	6. Create incentive program for drought-resistant practices.	NEDA, UNL Extension
	7. Develop insect and plant disease assistance.	NEDA, UNL Extension

IMPACT	PLANNED ACTIONS	ASSISTANCE AGENCIES
Decreased irrigation water from surface water sources prevents achievement of crop harvest potential	1. Emphasize adjustment of irrigated acreage to meet expected water availability.	DNR, NRDs, NRCS, Irrigation Districts, UNL Extension, USBR
	2. Emphasize the use of crop insurance programs.	FSA, Crop Insurance Groups
	3. Develop alternatives for increasing available irrigation water supply by use of temporary water transfers.	DNR
	4. Develop a funded loan program to encourage installation of on-farm water conservation measures.	USBR, DNR, DEQ, NRDs
Water storage may not be adequate in long-term drought	1. Evaluate water storage necessary for long-term sustainability.	DNR, Attorney General, USBR
	2. Improve monitoring of water levels in state reservoirs.	DNR, USBR, USACE
	3. Investigate drought component within water compacts between Nebraska and neighboring states.	DNR, Attorney General
Increased irrigation pumping from underground water sources may lower water levels and decrease pumping rates resulting in less capacity to meet crop needs and decreasing the profitability of an irrigated cropping system	1. Continue to emphasize irrigation water management techniques and develop emergency loan program to promote installation of on-farm water conservation measures.	NRDs, USBR, DEQ, NRCS, UNL Extension, FSA, NEDA
	2. Maintain water-level measurement program to monitor declining aquifer levels.	NRDs, UNL CSD
	3. Maintain ground water metering efforts and establish an emergency allocation program.	NRDs
	4. Emphasize use of crop insurance program in high-probability drought years.	Crop Insurance Groups
	5. Develop appropriate crop insurance to meet needs of all areas of the state.	NWR, Crop Insurance Groups

IMPACT	PLANNED ACTIONS	ASSISTANCE AGENCIES
Loss of farmers and ranchers due to drought-induced bankruptcy	1. Encourage existing agricultural finance advisory committees to develop emergency repayment guidelines with banks due to drought-induced conditions. 2. Use Public Service Announcements to advertise emergency repayment guidelines, crop insurance programs, hotline numbers, and mediation services. 3. Encourage continuation of federal emergency indemnity plans for crop and livestock agriculture.	NEDA NEDA, Mediation Service, Farm Crisis Council, UNL Extension NEDA, FSA, NRDs
Drought-induced mental anguish of farmers and ranchers resulting in increased suicides, social, and family problems (Also included within the Municipal Water Supply, Health, and Energy Subcommittee plan)	1. Develop working partnerships with local ministerial alliances and local health offices to develop social counseling and support programs. 2. Implement and/or maintain farm/crisis hotline(s). 3. Use local TV and radio outlets to implement public information program directed at reducing drought-induced mental stress and for announcements for hotline numbers and mediation services.	Local health offices, local ministerial alliances, UNL Extension, NEDA, Center for Rural Affairs, HHS, national public health services, Mediation Service, Farm Crisis Council
Increased health problems for residents of areas experiencing problems from blowing dust (Also included within the Municipal Water Supply, Health, and Energy Subcommittee plan)	1. Communicate with state medical allergy and asthma experts to develop recommendations. 2. Establish education programs to increase awareness of dust-related respiratory problems and how proper land management can improve air quality. 3. Develop funded initiatives to explore mitigation of health effects.	UNMC, UNL Extension, NRDs, NRCS, local health offices, environmental health fund, NEMA, HHS
Damage to cropland and rangeland due to intrusion of wildlife species	1. Develop emergency guidelines for the emergency feeding and watering of native wildlife in their original habitat. 2. If needed, implement emergency control guidelines for invasion species on private cropland and rangeland. 3. Make funds available to reimburse farmers who lose crops from invasion of wildlife.	NEDA, Fish and Wildlife Service, Forest Service UNL Extension NEDA

IMPACT	PLANNED ACTIONS	ASSISTANCE AGENCIES
Decreased income from local dairy and feedlot operations due to drought-induced high cost of feedstocks.	1. Develop statewide and nationwide hotline system for locating feedstock sources. 2. Investigate possible system of subsidized purchases of replacement stock from "Limited Resource Producers".	NEDA, UNL Extension, producer organizations
Decline in stability of local economy and tax base due to decreased sales of agricultural support equipment	1. Develop statewide and regionwide agricultural support services hotline which would emphasize outside area purchases of agricultural services and equipment from local distributors. 2. Add agricultural production as recipient of tree assistance programs at the state level. 3. Provide tax credits to agricultural producers. 4. Create some plan to decrease property tax or establish payment plans when the ability to pay is greatly reduced. 5. Provide assistance for emergency feed and water transportation.	NEDA, USDA, Nebraska Department of Economic Development Game and Parks Commission, Nebraska Forest Service NDR County commissioners, NDR NEDA
Reduced tourism due to misperceptions about the effects of drought	1. Let potential tourists and travelers know what recreational opportunities exist, even in drought, via public relations, marketing, brochures, and the pre-established hotline and visitor centers.	Nebraska Division of Travel and Tourism

Assistance Agency Abbreviations and Acronyms

BLM	Bureau of Land Management
CSD	Conservation and Survey Division
DEQ	Nebraska Department of Environmental Quality
DNR	Nebraska Department of Natural Resources
FSA	Farm Service Agency
HHS	Nebraska Department of Health and Human Services
NDMC	National Drought Mitigation Center
NDR	Nebraska Department of Revenue
NEDA	Nebraska Department of Agriculture
NEMA	Nebraska Emergency Management Agency
NRCS	Natural Resources Conservation Service
NRDs	Nebraska Natural Resource Districts
SARE	Sustainable Agriculture Research and Education Program
UNL	University of Nebraska-Lincoln
UNMC	University of Nebraska Medical Center
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture

Appendix A

Nebraska Risk Assessment Committee
Nebraska Municipal Water Supply, Health, and Energy Subcommittee
Planned Mitigation Activities

PRIORITIZED IMPACTS	PRIORITIZED PLANNED ACTIONS	ASSISTANCE AGENCIES
1. Due to drought, many public water supply systems experience potable water demand problems.	1.Emphasize, and evaluate, long and short-term drought contingency plans for all systems. 2. Emphasize indoor and outdoor water conservation measures. 3. Maintain list of "problem systems", with history or potential for drought-related problems. 4. Develop programs and educate the public on the potential uses of wastewater. 5. Develop partnerships with utility companies and others who can help distribute drought-related information.	NHHS, League of Municipalities, NRDs, Nebraska Rural Water Association, NDEQ, AWWA, CED/UNL.
2. Many rural water districts and small public water systems (under 10,000 population) develop operational (mechanical) problems when operating for extended periods of drought.	1. Maintain list of "problem systems" with history or potential for drought-related problems. 2. Continue work with systems to develop a plan of long-term drought mitigation and short-term drought response actions. 3. Maintain communication means and use NeRWA newsletter and training sessions to address drought-related issues. 4. Explore, as needed, emergency funds.	NRWD, NEMA, Nebraska Section of AWWA, Nebraska Department of Economic Development (NDED), USDA Rural Development, League of Municipalities, NHHS, Midwest Assistance Program, NDEQ, UNL Extension, NRDs, Groundwater Foundation, Nebraska Department of Natural Resources, Nebraska Rural Water Association (NeRWA), EPA.
3. Due to drought, private wells experience water quality and quantity problems.	1. Encourage NRDs to evaluate situation. 2. Emphasize indoor and outdoor water conservation measures.	NRDs, CSD/UNL, CED/UNL
4. Increased irrigation may overdraft available aquifer and affect municipal and rural water supplies during drought.	1. Promote groundwater-metering efforts and establish an emergency allocation program. 2. Encourage statewide water level measurement program to effectively monitor aquifer levels.	NRDs, Bureau of reclamation, DOE, CSD/UNL, CED/UNL, USGS.

PRIORITIZED IMPACTS	PRIORITIZED PLANNED ACTIONS	ASSISTANCE AGENCIES
5. Drought induced mental anguish of farmers and ranchers resulting in increased suicides, social and family problems.	1. Use local TV and radio outlets to implement public information program directed at reducing drought-induced mental stress. 2. Implement and/or maintain farm/crisis hotline(s). 3. Develop working partnerships with local ministerial alliances and local health office as to develop social counseling and support programs. 4. Public service announcements for hotline numbers and mediation services.	NHHS, local health offices, local ministerial alliances, CED/UNL, NEDA, Centers for Rural Affairs, national public health services, Mediation Service, Farm Crisis Council.
6. Increased presence of large, industrial, independent water users may overdraft available aquifers during drought.	1. Maintain a list of large, industrial, independent water users. 2. Enhance communication between large, independent water users and municipal suppliers to implement water conservation and drought-preparedness guidelines.	NRDs, NDED, CSD/UNL, Nebraska Department of Natural Resources, League of Municipalities, CED/UNL.
7. Increased health problems for residents of areas experiencing blowing dust problems from drought-affected agricultural lands.	1. Communicate with state medical allergy and asthma experts to develop recommendations. 2. Establish education programs to increase awareness of dust-related respiratory problems and how soil and land conservation practices can improve air quality. 3. Develop funded initiatives to explore mitigation of health effects.	NHHS, UNMC, CED/UNL, NRDs, NRCS, Nebraska Emergency Management Agency (NEMA), local health offices, environmental health fund.
8. Drought-induced temperature extremes produce extreme living conditions for both rural and urban residents. Increased electrical usage may create overloads on available electrical grid network.	1. Develop information program to provide living guidelines and alternatives to enable residents to cope with extreme conditions. 2. Develop working partnerships with local urban and rural power suppliers to cooperate in providing energy and water conservation guidelines to public. 3. Develop an education program. 4. Learn about electrical bill assistance programs. 5. Learn about fan distribution programs	NHHS, HUD, CED/UNL, Nebraska Energy Office, Salvation Army, League of Women Voters, medical professionals, local utility companies, Nebraska Rural Electric Association, Nebraska Power Association, Nebraska Energy Office, League of Municipalities.

PRIORITIZED IMPACTS	PRIORITIZED PLANNED ACTIONS	ASSISTANCE AGENCIES
9. General impacts.	1. Promote plumbing guidelines that emphasize use of water efficient plumbing fixtures and appliances.	AWWA, League of Municipalities, Builders and Plumbers Associations, EPA.

Assistance Agency Abbreviations and Acronyms

AWWA	American Water Works Association
CED/UNL	Cooperative Extension Division – University of Nebraska-Lincoln
CSD/UNL	Conservation and Survey Division – University of Nebraska-Lincoln
NDED	Nebraska Department of Economic Development
NDEQ	Nebraska Department of Environmental Quality
DOE	Department of Energy
EPA	Environmental Protection Agency
HUD	Housing and Urban Development
NEDA	Nebraska Department of Agriculture
NEMA	Nebraska Emergency Management Agency
NHHS	Nebraska Health and Human Services
NRCS	Natural Resource Conservation Service
NRDs	Natural Resource Districts
NRWD	Nebraska Rural Water Districts
UNMC	University of Nebraska Medical Center
USGS	United States Geological Survey

Attachment B: Letters of Support

CITY OF LINCOLN NEBRASKA

PUBLIC WORKS & UTILITIES DEPARTMENT
Watershed Management
555 South 10th Street Suite 203 Lincoln, NE 68508
lincoln.ne.gov

April 7, 2016

Mr. Michael Dieterich
Bureau of Reclamation, Financial Assistance Services
Denver Federal Center, Building 67, Room 152
West 6th Avenue and Kipling Street
Denver, CO 80225

Dear Mr. Dieterich and Application Review Committee Members:

This letter is to document our support for the development of the Lower Platte River Drought Contingency Plan. The Nebraska Department of Natural Resources, together with five other Lower Platte River water management agencies, have organized the Lower Platte River Consortium and through an Inter-local Cooperative Agreement (ILCA) these agencies will work together to develop regional solutions to improve the water supply reliability and drought resiliency of the area.

The Lower Platte River serves approximately eighty percent of Nebraska's population, thousands of businesses and industries, over two million irrigated acres, and provides streamflows for threatened and endangered species. Advanced planning for drought extremes is critical to avoid a number of water-related risks identified in the Nebraska Department of Natural Resources application.

The Consortium will be a major part of the administrative framework needed for the planning effort, and will provide critical coordination between state and local water managers. As a member of the Consortium, our department will also assist with public outreach as the plan is developed and implemented.

The drought-driven risks are diverse and alternatives for resolving them will be developed through this planning effort. As members of the Lower Platte River Consortium, we fully support the Nebraska Department of Natural Resources application and urge the Bureau of Reclamation to recognize the importance and need for its support and funding.

Sincerely,

Donna K. Garden

Donna K. Garden
Assistant Director of Public Works & Utilities
402-441-8605
dgarden@lincoln.ne.gov

METROPOLITAN
UTILITIES DISTRICT

SCOTT L. KEEP
PRESIDENT
(402) 504-7106
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Scott_Keep@mudnebr.com

April 8, 2016

Mr. Michael Dieterich
Bureau of Reclamation
Financial Assistance Services
Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

Dear Mr. Dieterich and Application Review Committee members,

This letter is to document our support for the development of the Lower Platte River Drought Contingency Plan. The Nebraska Department of Natural Resources, together with five other Lower Platte River water management agencies, have organized the Lower Platte River Consortium and through a proposed Interlocal Cooperative Agreement (ILCA), these agencies will work together to develop regional solutions to improve the water supply reliability and drought resiliency of the area.

The Lower Platte River serves approximately eighty percent of Nebraska's population, thousands of businesses and industries, over two million irrigated acres, and provides stream flows for threatened and endangered species. Advanced planning for drought extremes is critical to avoid a number of water-related risks identified in the Nebraska Department of Natural Resources application. The Metropolitan Utilities District of Omaha supplies drinking water to more than 600,000 people and the Lower Platte River is essential to our ability to provide this service.

The Consortium will be a major part of the administrative framework needed for the planning effort, and will provide critical coordination between state and local water managers. The drought-driven risks are diverse and alternatives for resolving them will be developed through this planning effort. We fully support the Nebraska Department of Natural Resources application and urge the Bureau of Reclamation to recognize the importance and need for its support and funding.

Sincerely,

Scott L. Keep,

Attachment C: Letters of Financial Commitment

STATE OF NEBRASKA

Pete Ricketts
Governor

DEPARTMENT OF NATURAL RESOURCES
Gordon W. "Jeff" Fassett, P.E.
Director

April 7, 2016

Mr. Michael Dieterich Bureau of Reclamation
Financial Assistance Services
Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

Dear Mr. Dieterich and Application Review Committee members,

This letter is to document our support and financial commitment for the development of the Lower Platte River Drought Contingency Plan. Our agency along with five other Lower Platte River water management agencies, have organized the Lower Platte River Consortium and through an Inter-local Cooperative Agreement (ILCA) our agencies will to work together to develop regional solutions to improve the water supply reliability and drought resiliency of the area.

The Lower Platte River serves approximately eighty percent of Nebraska's population, thousands of businesses and industries, over two million irrigated acres, and provides streamflows for threatened and endangered species. Advanced planning for drought extremes is critical to avoid a number of water-related risks identified in our application.

As Director of the Nebraska Department of Natural Resources I am authorized to commitment financial resources in support of this application. Our agency will commit $100,000 in financial support for this application. These dollars combined with the $100,000 commitment from the Lower Platte South Natural Resources District will provide a total local cost-share of $200,000 for the application.

The drought-driven risk in the Lower Platte River is diverse and alternatives for resolving them will be developed through this planning effort. As members of the Lower Platte River Consortium and applicant for the Lower Platte River Drought Contingency Plan we urge the Bureau of Reclamation to recognize the importance and need for support and funding of this effort.

Sincerely,

Gordon W. Fassett, P.E.
Director

cc:
Glenn Johnson, LPS NRD

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April 7, 2016

Mr. Michael Dieterich
Bureau of Reclamation
Financial Assistance Services
Denver Federal Center
Bldg. 67, Rm. 152
6th Avenue and Kipling Street
Denver, CO 80225

Dear Mr. Dieterich and Application Review Committee members,

This letter is to document our support and financial commitment for the development of the Lower Platte River Drought Contingency Plan. Our agency along with the Nebraska Department of Natural Resources and four other Lower Platte River water management agencies, have organized the Lower Platte River Consortium and through an Inter-local Cooperative Agreement (ILCA) our agencies will to work together to develop regional solutions to improve the water supply reliability and drought resiliency of the area.

The Lower Platte River serves approximately eighty percent of Nebraska's population, thousands of businesses and industries, over two million irrigated acres, and provides streamflows for threatened and endangered species. Advanced planning for drought extremes is critical to avoid a number of water-related risks identified in the Nebraska Department of Natural Resources application.

As General Manager of the Lower Platte South Natural Resources District I am authorized to commitment financial resources in support of this application. The Lower Platte South Natural Resources District will commit $100,000 in local financial support for the proposal submitted by the Nebraska Department of Natural Resources. These dollars combined with the $100,000 commitment from the Nebraska Department of Natural Resources will provide a total local cost-share of $200,000 for the proposal.

The drought-driven risk in the Lower Platte River is diverse and alternatives for resolving them will be developed through this planning effort. As members of the Lower Platte River Consortium, we fully support the Nebraska Department of Natural Resources application and urge the Bureau of Reclamation to recognize the importance and need for support and funding.

Sincerely,

Glenn D. Johnson
General Manager
GDJ:gdj