

# Lessons Learned from Tribal Drought Planning



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# 1998 National Drought Policy Act (P.L. 105-199)

## Established National Drought Policy Commission

- develop recommendations for preparing for and responding to drought, including tribal lands
- Intertribal Agriculture Council, NRCS, Reclamation, and NDPC surveys and outreach to identify tribal drought planning activities
- findings reported in “Preparing for Drought in the 21<sup>st</sup> Century” (2000)

[<http://govinfo.library.unt.edu/drought/finalreport/fullreport/reportdload.htm>]

# NDPC Major Findings:

- Most tribes rely on own disaster management programs, which count heavily on federal assistance
- Accessing federal programs is a difficult process; eligibility and cost-share requirements make it difficult for tribes/members to participate; funding is limited
- Many tribes lack access to drought monitoring data, which is essential for drought planning and triggering emergency responses

**Conclusion: lack of funds/tools necessary to prepare for and response to drought**

# NDPC: Tribal Drought Mitigation Planning

Some tribes involved in proactive drought planning activities:

- Hopi Tribe, Hualapai Nation, Navajo Nation, Zuni Pueblo in Arizona and New Mexico; [Fort Peck Tribes \(2004\)](#) and [Northern Cheyenne Tribe \(2006\)](#) in Montana; [Eastern Shoshone and Northern Arapaho Tribes](#) in Wyoming

Plans include mitigation planning that involves implementing actions in advance of drought

- Reclamation Native American Affairs Technical Assistance Program and Reclamation States Emergency Drought Program
- \$25,000-\$200,000 per plan for initial plans

# Tribal Drought Planning Workshop

Flagstaff, AZ (2004)

- 27 representatives of 11 tribes in Lower Colorado Region
- Navajo Nation, Hopi Tribe, Hualapai Tribe, and Zuni Pueblo presented lessons learned during their drought planning process



Drought Planning Workshop  
June 29-30, 2004  
Radisson Woodlands Hotel  
Flagstaff, AZ

The [National Drought Mitigation Center](#) (NDMC) is organizing this drought planning workshop to be held at the Radisson Woodlands Hotel in Flagstaff, Arizona, June 29-30, 2004. The Lower Colorado Regional Office of the Bureau of Reclamation is sponsoring this workshop. Participation is open to representatives of the tribes in the Lower Colorado Region. During the first day of the workshop, the drought planning process will be discussed. The second day will focus on the lessons learned by the tribes with drought plans ([see the agenda](#)).

[Workshop Schedule](#)

[Registration](#)

[Hotel Information](#)

[Links](#)

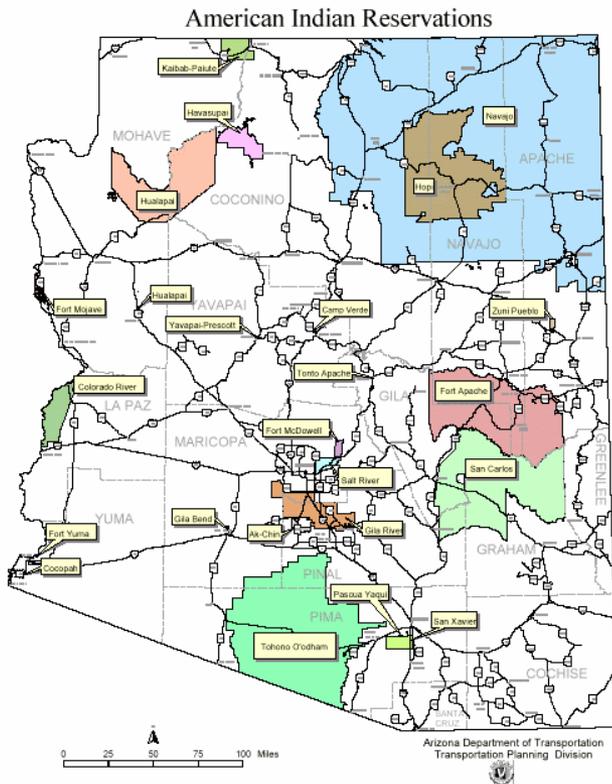
# Workshop Results:

## Why Drought Planning is Important

- Provides a procedure for tribal governments to declare drought rather than waiting for state or federal government – increased autonomy
- Opportunity to investigate how a tribe and tribal lands are vulnerable to drought and actions to mitigate those vulnerabilities
- Identify and justify capital improvement projects, equipment, and training activities required to implement the drought plan

# Tribal Drought Planning

## The Hualapai Nation



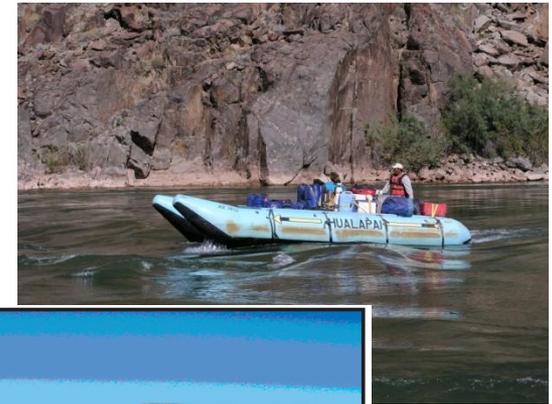
# HUALAPAI RESERVATION BACKGROUND

**Location:** NW Arizona

**Size:** 1 million acres; 108 miles of the Colorado River in Grand Canyon

**Habitats:** ponderosa pine forests, pinyon-juniper woodlands to dry desert scrub.

**Economy:** **Tourism** (river rafting, Grand Canyon tours), **cattle ranching, timber sales, big game hunting** (bighorn sheep, elk, antelope)



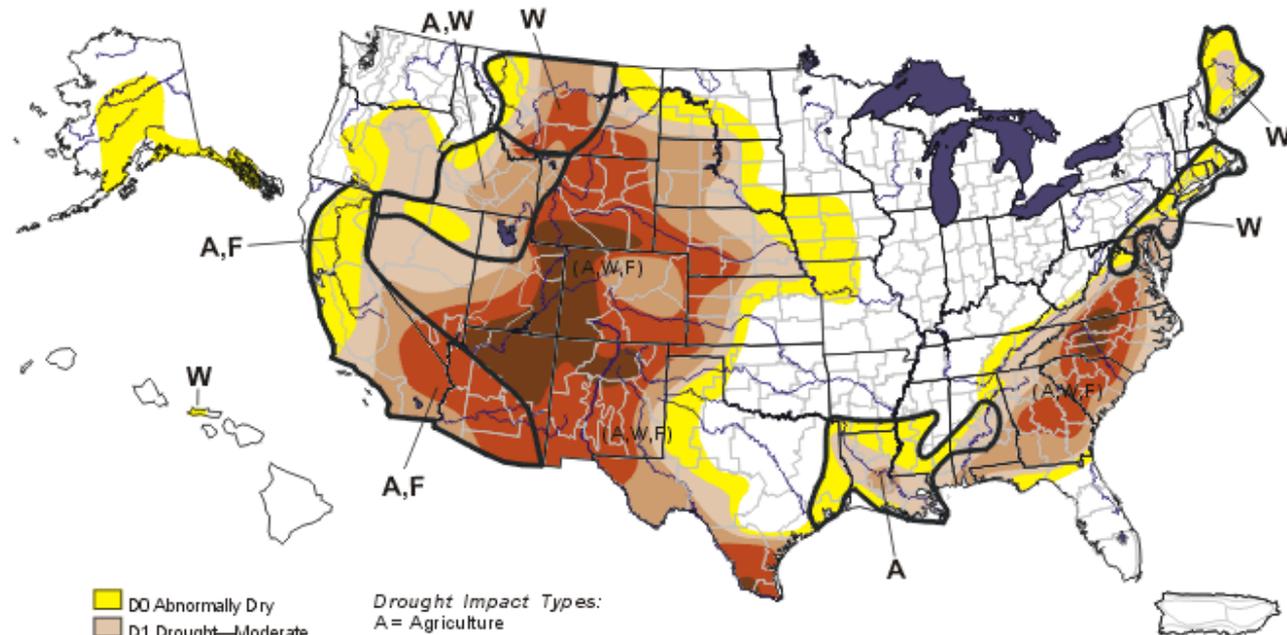


## Case Study: Hualapai Tribe, Arizona

- Tribe completed the plan themselves
- NDMC provided input/review of the Hualapai Drought Plan
- NDMC received a grant from Natural Hazards Center to evaluate tribe's planning process
- Reclamation asked NDMC to conduct a "test" of a tribe's drought plan
- Conducted evaluation and test in October 2005 with permission of Hualapai Tribe

# Drought Planning Impetus: **Drought**

## *U.S. Drought Monitor* July 2, 2002 Valid 8 a.m. EDT



- D0 Abnormally Dry
  - D1 Drought—Moderate
  - D2 Drought—Severe
  - D3 Drought—Extreme
  - D4 Drought—Exceptional
- Drought Impact Types:*  
 A = Agriculture  
 W = Water (Hydrological)  
 F = Fire danger (Wildfires)  
 — Delineates dominant impacts  
 (No type = All 3 impacts)

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.*

<http://drought.unl.edu/dm>



**Released Wednesday, July 3, 2002**

*Author: Michael Hayes, NDMC*

## Drought Impacts:

- water shortages
- increased wildfires
- road closures - fire threat
- forage reduction
- invasive species
- heavy culling of cattle
- supplemental hay and water hauling
- wildlife and cattle deaths
- increase in wildlife disease
- loss in quality of trophy bighorn sheep and elk
- reduction in hunting permits
- loss of wetlands and riparian habitat
- wind erosion and visibility problems
- river rafting business losses



**Drought planning funding through US Bureau of Reclamation**

# Hualapai Drought Planning

“We assembled a team from within the Natural Resources Department to identify personnel, programs, departments and local and regional agencies that would be responsible for drought monitoring, drought response activities, implementation of drought preparedness mitigation and for drought relief funding during the various phases of drought conditions.”

Dr. Kerry Christensen

**Problem:** one coordinator

– **too complex; resistance**

# Drought Task Force

- Water Resources Program Manager
- BIA Fire Management Officer
- Wildlife, Fisheries and Parks Program Manager
- Agriculture Program Manager and Assistant Manager
- Air Quality Program Manager
- A Tribal Elder
- Willing Presidents of the livestock associations

# Hualapai Tribal Participants

- Drought Task Force
- Agriculture Program
- Range Water Program
- Water Resources Program
- Cattle Districts
- Public Works Department
- Planning Department
- Wildlife, Fisheries, and Parks Program
- Natural Resources Department
- Forestry Program
- Hualapai Tribal Council

# Outside Participants

- Bureau of Indian Affairs
  - Forestry Program (Fire)
- Mohave County
- Arizona Game and Fish Department
- U.S. Fish and Wildlife Service
- U.S. Bureau of Reclamation

# Project Leadership:

- ❖ **Expanded leadership and held community meetings**
  - Educate people about drought and the process
  - Foster “buy-in” to the project
  - Gain information for the planning process
- ❖ **Iterative review among relevant tribal officials**
- ❖ **Fostered input on drought impacts, vulnerabilities, and monitoring and management options**

Table 3. Drought triggering criteria across drought categories.

Drought Stage	Characteristics
Normal	PDSI between -0.9 and +5.0, Six month SPI positive.
Alert (mild drought)	PDSI is between -1.0 and -1.9 for greater than 2 months or between -2.0 and -2.9 for 1 month. Six month SPI between 0 and -0.99.
Warning (moderate drought)	PDSI is between -1.0 and -1.9 for 9 months or more, -2.0 to -2.9 for at least 2 months, or -3.0 or less for at least 1 month. Six month SPI declining and between -1.00 and -1.49.
Emergency (severe to extreme drought)	PDSI is between -2.0 to -2.9 for 9 months or more, -3.0 to -3.9 for at least 2 months, or -4.0 or less for at least one month. Six month SPI declining and less than -1.5.

Table 4. Water storage levels associated with the various drought conditions.

Drought Stage	Storage Level
Normal	Average storage $\geq$ 60 %
Alert	Average storage = 40-59 %
Warning	Average storage = 25-39 %
Emergency	Average storage $\leq$ 25 %

**Depending on the stage, the plan outlines mitigation and response actions that are to be carried out by the responsible tribal agency**

# ACTIVITIES UNDER “NORMAL” CONDITIONS

Agency/Entity	Activities
Agriculture Program	<ul style="list-style-type: none"><li>• <b>Quarterly monitoring of storage facilities</b></li><li>• <b>Monitor utilization plots</b></li><li>• <b>Implement grazing plan</b></li></ul>
BIA Forestry	<ul style="list-style-type: none"><li>• <b>Perform prescribed burns and fuel reduction</b></li><li>• <b>Report fire vulnerability quarterly</b></li></ul>
Range Water Program	<ul style="list-style-type: none"><li>• <b>Install new drinkers</b></li><li>• <b>Purchase trash pumps</b></li><li>• <b>Communicate storage conditions to HDNR Director on monthly basis</b></li></ul>

# ACTIVITIES UNDER “EMERGENCY” DROUGHT CONDITIONS

Agency/Entity	Activities
Agriculture Program	<ul style="list-style-type: none"><li>• <b>Deliver domestic water by hauling</b></li><li>• <b>Continue monthly reporting. Hold emergency meetings when necessary.</b></li><li>• <b>Implement supplemental feeding</b></li><li>• <b>Haul water to catchments. Identify need for catchment construction.</b></li><li>• <b>Implement emergency grazing plan</b></li><li>• <b>Move cattle to forage and/or reduce stocking rate.</b></li></ul>

# Identified Capital Improvement Projects

- Feasibility study for a hydro-electric dam
- above-ground storage tanks
- wells and pipelines
- two water trucks
- repair earthen dams





# Peach Springs Cistern



# Dam Renovation



NDMC 2005

# Spring Enhancements



# Wildlife Drinkers



# Tamarisk Removal



# Further Investment in Mitigation

Estimated Hualapai Tribe drought mitigation expenditures from 2003-2007 (Kerry Christensen, Hualapai Department of Natural Resources, personal communication, March 20, 2007).

Mitigation Activities	Hualapai Tribe Drought Mitigation Expenditures					Total
	2003	2004	2005	2006	2007	
Wetland protection	\$385,865	\$74,000	\$60,241	\$100,000		\$620,106
Wells and pipeline		\$127,357			\$289,638	\$416,995
Peach Springs well		\$50,000				\$50,000
Range monitoring		\$25,000	\$25,000	\$25,000	\$25,000	\$100,000
Water catchments			\$50,000	\$50,000	\$50,000	\$150,000
Fencing		\$18,000				\$18,000
Tamarisk removal			\$18,706			\$18,706
<b>Total</b>	<b>\$385,865</b>	<b>\$294,357</b>	<b>\$153,947</b>	<b>\$175,000</b>	<b>\$364,638</b>	<b>\$1,373,807</b>

Submitted to:

United States Bureau of Reclamation  
Lower Colorado Region  
P.O. Box 61470  
Boulder City, NV 89006-1470

Prepared by:

Dr. Kerry Christensen  
Hualapai Tribe  
Department of Natural Resources  
P.O. Box 300  
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December, 2003

# Test of Hualapai Drought Plan (2005)

Tribal officials were presented with drought scenarios and how they should react, in accordance with plan

Commented on roles and usefulness of the plan



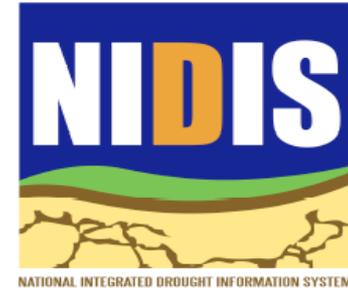
## Benefits:

- Educated new staff on the plan and their roles
- Identified barriers to implementation
- Provided suggestions for improvement

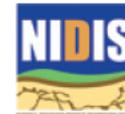
# Recommendations for Other Planners

- Develop a drought plan
- Foster a collaborative drought planning effort
- Initiate a public education and discussion component
- Focus on three components: drought monitoring, vulnerability assessment, and risk management
- View drought management in a long-term, holistic perspective
- Establish a “network of collaboration” in the region
- Ensure agencies are aware of their roles and the plan is updated regularly

**Climate Change, Drought and Early Warning on  
Western Native Lands Workshop Report**  
*9-11 June, 2009 Jackson Lodge, Grand Teton National Park, WY*



**Drought Preparedness**  
for *Tribes* in the **Four Corners Region**





# Critical Needs

## *for Improving Drought Planning and Response*

- 
- Reliable resources to support tribal drought planning and response
  - Methods for integrating local and traditional knowledge into environmental monitoring and planning
  - Education and outreach programs about drought, climate change, and water scarcity
  - Technical training opportunities related to climate monitoring for tribal resource managers
  - Better climate monitoring and access to available regional data

# Thank You!

Please contact me for additional information.

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