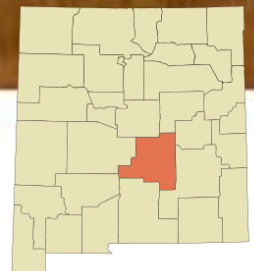




# MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN JULY 2018

Village of Ruidoso, Lincoln County  
Including  
City of Ruidoso Downs, Town of





## **EXECUTIVE SUMMARY**

Throughout the United States, natural and human-caused disasters have led to increasing levels of death, injury, property damage, and interruption of business and government services. Families and individuals can be immensely affected and businesses that are damaged cannot contribute to the economy. The money, time and effort to respond to and recover from these emergencies or disasters divert public resources and attention from other important programs and problems. The five jurisdictions contained within Lincoln County, New Mexico participating in this planning effort recognize the consequences of disasters and the need to reduce the impacts of natural and human-caused hazards. The County and jurisdictions also know that with careful selection, mitigation actions in the form of projects and programs can become long-term, cost effective means for reducing the impact of natural and human-caused hazards.

The elected and appointed officials of Lincoln County demonstrated their commitment to hazard mitigation in 2011-2012 by preparing the first Lincoln County All Hazard Mitigation Plan (2012 Plan). The 2012 Plan covered the county jurisdiction and was approved by FEMA on April 30, 2012. In order to remain compliant with the congressional regulations, the county must perform a full plan update and obtain FEMA approval.

In response, the Village of Ruidoso, City of Ruidoso Downs, Town of Carrizozo, Village of Capitan, and Village of Corona partnered with Lincoln County to accomplish a Multi-Jurisdictional Hazard Mitigation Update. The Village of Ruidoso secured a federal planning grant and hired SZ Enterprises, LLC to assist all the participating jurisdictions within Lincoln County on the update process. The Village of Ruidoso reconvened a mitigation planning team (MPT) comprised of veteran and first-time representatives from each participating jurisdiction, and other various county, state, and federal departments and organizations. The MPT began meeting in July 2016 and completed in May 2018. The meetings and MPT worked in a collaborative effort to review, evaluate, and update the 2012 Plan keeping the single, consolidated multi-jurisdictional plan format and approach. The 2018 Plan will continue to guide the County and participating local jurisdictions toward greater disaster resistance in full harmony with the character and needs of the community and region.

The Plan has been prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act or the Act), 42 U.S. C. 5165, enacted under Sec. 104 the Disaster Mitigation Act of 2000, (DMA 2000) Public Law 106-390 of October 30, 2000, as implemented at Title 44 CFR 201.6 and 201.7 dated October, 2007. The Plan includes risk assessments for multiple natural hazards, a public outreach effort, and development of a mitigation strategy that incorporates measures intended to eliminate or reduce the effects of future disasters throughout Lincoln County. The development of the various 2018 Plan elements was accomplished through a joint and cooperative venture by members of the MPT, with Village of Ruidoso serving as the lead agency and primary point of contact for the planning effort.

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## SECTION 1: JURISDICTIONAL ADOPTION AND FEMA APPROVAL

**Requirement §201.6(c)(5):** *[The local hazard mitigation plan shall include...] Documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, County Commissioner, Tribal Council). For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.*

**Requirement §201.6(d)(3):** *A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to continue to be eligible for mitigation project grant funding.*

**Requirement §201.7(a)(1):** *Indian tribal governments applying to FEMA as a grantee must have an approved Tribal Mitigation Plan meeting the requirements of this section as a condition of receiving non-emergency Stafford Act assistance and FEMA mitigation grants.*

**Requirement §201.7(a)(4):** *Multi-jurisdictional plans (e.g. county-wide or watershed plans) may be accepted, as appropriate, as long as the Indian tribal government has participated in the process and has officially adopted the plan. Indian tribal governments must address all the elements identified in this section to ensure eligibility as a grantee or as a sub-grantee.*

### 1.1 DMA 2000 Requirements

#### 1.1.1 General Requirements

This 2018 update of the Lincoln County Multi-Jurisdictional Hazard Mitigation Plan (Plan) has been prepared in compliance with Section 322 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988 (Stafford Act), 42 U.S.C. 5165, as amended by Section 104 of the Disaster Mitigation Act of 2000 (DMA 2000) Public Law 106-390 enacted October 30, 2000. The regulations governing the mitigation planning requirements for local mitigation plans are published under the Code of Federal Regulations (CFR) Title 44, Section 201.6 (44 CFR §201.6). Minimum requirements for tribal mitigation plans are published under CFR Title 44, Section 201.7 (44 CFR §201.7). Additionally, a DMA 2000 compliant plan that addresses flooding will also meet the minimum planning requirements for the Flood Mitigation Assistance program as provided for under 44 CFR §78.

DMA 2000 provides requirements for States, Tribes, and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning<sup>1</sup>. The local mitigation plan is the representation of the jurisdiction's commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Local plans will also serve as the basis for the State to provide technical assistance and to prioritize project funding.

Under 44 CFR §201.6 and §201.7, local and tribal governments must have a Federal Emergency Management Agency (FEMA)-approved local mitigation plan in order to apply for and/or receive project grants as a sub-grantee under the following Hazard Mitigation Assistance (HMA) programs:

- Hazard Mitigation Grant Program (HMGP)
- Pre-Disaster Mitigation (PDM)
- Flood Mitigation Assistance (FMA)

In addition, Indian Tribal governments applying to FEMA as a grantee must have an approved tribal mitigation plan meeting the requirements of 44 CFR §201.7 as a condition of

receiving non- emergency Stafford Act assistance through Public Assistance Categories C through G and the above mentioned HMA program funds.

### **1.1.2 Update Requirements**

DMA 2000 requires that existing plans be updated every five years, with each plan cycle requiring a complete review, revision, and re-approval of the plan at both the state and FEMA level. Lincoln County, the incorporated communities of Village of Ruidoso, City of Ruidoso Downs, Town of Carrizozo, Village of Capitan, and Village of Corona are all currently covered under a FEMA approved multi- jurisdictional hazard mitigation plan. The Plan is the result of an update process performed by the participating jurisdictions to update the current 2012 version of the Lincoln County All Hazard Mitigation Plan (2012 Plan).

## **1.2 Official Record of Adoption**

Promulgation of the Plan is accomplished through formal adoption of official resolutions by the governing body for each participating jurisdiction in accordance with the authority and powers granted to those jurisdictions by the State of New Mexico and/or the federal government. Participating jurisdictions in the Plan include:

County	Villages	Towns	City
<ul style="list-style-type: none"><li>Lincoln</li></ul>	<ul style="list-style-type: none"><li>Ruidoso</li><li>Capitan</li><li>Corona</li></ul>	<ul style="list-style-type: none"><li>Carrizozo</li></ul>	<ul style="list-style-type: none"><li>Ruidoso Downs</li></ul>

Each jurisdiction will keep a copy of their official resolution of adoption located in Appendix A of their copy of the Plan.

## **1.3 FEMA Approval Letter**

The Plan was submitted to the New Mexico Department of Homeland Security and Emergency Management (DHSEM), the authorized state agency, and FEMA, for review and approval. FEMA's approval letter is provided on the following page.

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<sup>1</sup> FEMA, 2008, *Local Multi-Hazard Mitigation Planning Guidance*

*[Insert FEMA Approval Letter Here]*

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## SECTION 2: INTRODUCTION

### 2.1 Plan Purpose and Authority

The purpose of the Plan is to identify natural hazards that impact the various jurisdictions located within Lincoln County, assess the vulnerability and risk posed by those hazards to community-wide human and structural assets, develop strategies for mitigation of those identified hazards, present future maintenance procedures for the plan, and document the planning process. The Plan is prepared in compliance with DMA 2000 requirements and represents a multi-jurisdictional update of the 2012 Plan.

Funding for the development of the Plan was provided through a PDM planning grant obtained by Village of Ruidoso through the State of New Mexico (DHSEM) from FEMA, with each participating jurisdiction providing the matching funds. SZ Enterprises, LLC was retained by Village of Ruidoso to provide consulting services in guiding the update planning process and Plan development.

### 2.2 General Plan Description

The Plan is generally arranged and formatted to be consistent with the 2013 New Mexico Hazard Mitigation Plan (State Plan) and is comprised of the following major sections:

**Planning Process** – this section summarizes the planning process used to update the Plan, describes the assembly of the planning team and meetings conducted, and summarizes the public involvement efforts.

**Community Description** – this section provides an overall description of the participating jurisdictions and the County as a whole.

**Risk Assessment** – this section summarizes the identification and profiling of natural hazards that impact the County and the vulnerability assessment for each hazard that considers exposure/loss estimations and development trend analyses.

**Mitigation Strategy** – this section presents a capability assessment for each participating jurisdiction and summarizes the Plan mitigation goals, objectives, actions/projects, and strategy for implementation of those actions/projects.

**Plan Maintenance Strategy** – this section outlines the proposed strategy for evaluating and monitoring the Plan, updating the Plan in the next 5 years, incorporating plan elements into existing planning mechanisms, and continued public involvement.



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## SECTION 3: PLANNING PROCESS

**§201.6 (b):** *Planning process. An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:*

- (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;*
- (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and*
- (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.*

**§201.6(c)(1):** *[The plan shall include...] (1) Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.*

This section includes the delineation of various DMA 2000 regulatory requirements, as well as the identification of key stakeholders and planning team members within Lincoln County. In addition, the necessary public involvement meetings and actions that were applied to this process are also detailed.

### 3.1 Update Process Description

Village of Ruidoso applied for and received a PDM planning grant to fund a multi-jurisdictional effort to review and update the 2012 Lincoln County Plan. Letters from the participating jurisdictions were received to be included in the PDM planning grant application. Once the grant was received, the Village of Ruidoso then selected SZ Enterprises, LLC to work with the participating jurisdictions and guide the Plan update process. An initial project kick-off meeting between SZ Enterprises, LLC and participating jurisdictions was convened July 27, 2016 to line up the meeting dates and agendas for the coming planning efforts, discuss the plan format and potential changes to the Plan outline and content to address recent FEMA guidelines, request initial data, and other administrative tasks. Six mitigation planning team (MPT) meetings and five local planning team (LPT) meetings were conducted over the period of July 2016 to April 2017, along with all the work required to collect, process, document updated data, and make changes to the Plan. Details regarding updated key contact information and promulgation authorities, the planning team selection, participation, and activities, and public involvement are discussed in the following sections.

### 3.2 Previous Planning Process Assessment

The first task of preparation for the Plan update, was to evaluate the process used to develop the 2012 Plan. This was initially discussed in the July 27, 2016 kick-off meeting with the goal of establishing the framework for the planning effort ahead. The 2012 Plan process employed a single jurisdictional approach and during plan development, the contractor sent sections, or parts of sections, to the Emergency Services Director, who disseminated the information to those who were unable to attend scheduled meetings, for review. All members of the Mitigation Planning Group (MPG) were kept informed via contact by email. Their input was shared with the MPG members through discussion at MPG meetings, by email, and through personal contact. The MPG members then submitted revisions or additional details. The Emergency Services Director then presented the revisions to the contractor, who incorporated them into the plan.

Most of the planning team members were new to the hazard mitigation planning process altogether, so there was very little institutional knowledge of the prior process. The Plan update process that was embraced employed a multi-jurisdictional approach with representation from each participating jurisdiction

in larger multi-jurisdictional planning team meetings wherein concepts would be presented and discussed, and work assignments would be made for completion by each jurisdiction.

### 3.3 Planning Team

#### 3.3.1 General

The planning team was organized as two levels for this Plan update. The first level, the team was developed as a Mitigation Planning Team (MPT) that was comprised of one or more representatives from each participating jurisdiction. The Local Planning Team (LPT) was the second level.

The role of the MPT was to work with the planning consultant to perform the coordination, research, and planning element activities required to update the 2012 Plan. Attendance by each participating jurisdiction was highly recommended for every MPT meeting as the meetings were structured to progress through the plan update process, and consideration by the MPT was given for the smaller jurisdictions that could not attend every MPT meeting, especially in the case with the Village of Corona. Due to understaffing, Corona was only able to attend one MPT meeting, but Corona's participation via email, phone, and LPT meeting, was viewed as acceptable participation to the MPT. Steps and procedures for updating the 2012 Plan were presented and discussed at each MPT meeting, and worksheet assignments were normally given. Each meeting built on information discussed and assignments made at the previous meeting. The MPT representatives also had the responsibility of being the liaison to their own jurisdiction, and were tasked with:

- Conveying information and assignments received at the MPT meetings
- Ensuring all requested worksheets were completed fully and returned on a timely basis
- Responsible for review and official adoption of the Plan

The LPT was responsible for the following tasks:

- Assist the MPT representative by providing support and data
- Make planning decisions regarding plan update components
- Review the draft Plan

#### 3.3.2 Planning Team Assembly

At the beginning of the update planning process, the Village of Ruidoso organized and identified members for the MPT by initiating contact with the (Primary Points of Contact) PPOCs identified in the 2012 Plan, their equivalent, or the emergency manager for all 5 incorporated jurisdictions, county, town, villages, and city. All the other villages and towns in Lincoln County are not incorporated and are included in the Lincoln County jurisdiction. In July 2016, a kick-off email letter was sent to the identified MPT members announcing the start of the planning effort. The MPT/LPT representatives and MPT stakeholders are summarized in Table 3-1. Stakeholders refer to anyone who has an interest in the plan but is not a representative of one of the six jurisdictions. Returning planning team members from the 2012 Plan are highlighted with an asterisk\*.

**Table 3-1: Summary of mitigation planning team representatives/stakeholders**

<b>Name</b>	<b>Jurisdiction / Organization</b>	<b>Department / Position</b>	<b>Planning Team Role</b>
Cody Thetford	Village of Ruidoso	Fire Department Interim Fire Chief	MPT Committee Chairperson MPT representative
Orlando A. Arriola Sr.	Village of Ruidoso	Fire Department Fire Chief	MPT representative
Jerry Corliss	Village of Ruidoso	Fire Department Lieutenant	MPT representative
Michael Morrow	Village of Ruidoso	Fire Department Captain	MPT representative
Darren Hooker	Village of Ruidoso	Police Department Chief	MPT representative
Lawrence T. Chavez	Village of Ruidoso	Police Department Lieutenant	MPT representative
Debi Lee	Village of Ruidoso	Village Manager	LPT representative
Randall Kalama	Village of Ruidoso	Acting Emergency Manager	LPT representative
JR Baumann	Village of Ruidoso	Public Works Director	LPT representative
Bradford Dyjak	Village of Ruidoso	Planning Director	LPT representative
Dick Cooke	Village of Ruidoso	Village Forester	LPT representative
Adam Sanchez	Village of Ruidoso	Water/Sewer Director	LPT representative
Curt Temple*	Lincoln County	Interim Road Dept. Director	MPT representative
Joe Kenmore*	Lincoln County	Office of Emergency Services Emergency Services Director	MPT representative
Samantha Mendez	Lincoln County	Interim Planning Director	MPT representative
Chris Rupp	Ruidoso Downs	Police Department Chief	MPT representative
Kenny Ellard	Ruidoso Downs	Fire Department Assistant Fire Chief	MPT representative
Steve Dunigan	Ruidoso Downs	Planning Services Director	MPT representative
Darrell Chavez	Ruidoso Downs	Police Department / Lieutenant	MPT representative
Anthony Sanchez	USFS	FMO	MPT stakeholder
Yovanne Lucero	Carrizozo	Mayor	MPT representative
Leann Weihbrecht	Carrizozo	Clerk	MPT representative
David Cox	Capitan	Public Work	MPT representative
William Hignight	Corona	Mayor	LPT representative
Brad Gage	Corona	Fire Chief	MPT representative
William Weckwerth	Corona	Assistant	LPT representative

### 3.3.3 *Planning Team Activities*

The MPT met for the first time on July 27, 2016 to begin the plan update process. Five more meetings were convened about twice a month to step through the plan review and update process. Each MPT member was sent a copy of the 2012 Plan for review and reference, and was instructed to review the section being updated in advance of the meeting that section was discussed.

Table 3-2 summarizes the MPT and LPT meetings convened, along with a brief list of the agenda items discussed. Detailed meeting notes for all of the MPT and LPT meetings are provided in Appendix B.

<b>Table 3-2: Summary of planning meetings convened as part of the plan update process</b>	
<b>Meeting Type, Date, and Location</b>	<b>Meeting</b>
Pre-Planning Kick-Off Meeting  July 22, 2016  Village of Ruidoso Fire Dept. Station 1, Ruidoso NM	<ul style="list-style-type: none"> <li>• Discuss schedule of MPT meetings</li> <li>• Discuss Plan outline and changes required by FEMA guidelines</li> <li>• Strategize the MPT list</li> <li>• Discuss roles of Village of Ruidoso and SZ Enterprises in the overall planning process</li> </ul>
MPT Meeting No. 1  July 27, 2016  Village of Ruidoso Fire Dept. Station 1 Ruidoso, NM	<ul style="list-style-type: none"> <li>• <b>Initial Introductions and Welcome</b></li> <li>• <b>Purpose, Need, Expectations</b> <ul style="list-style-type: none"> <li>○ General Overview</li> <li>○ Update Requirements</li> <li>○ Proposed Outline for New Plan</li> </ul> </li> <li>• <b>Planning Process</b> <ul style="list-style-type: none"> <li>○ Discussion Of Last Planning Process</li> <li>○ Planning Team Roles And Responsibilities</li> </ul> </li> <li>• <b>Public Involvement</b> <ul style="list-style-type: none"> <li>○ Discuss Past Strategy</li> <li>○ Formulate New Strategy</li> <li>○ Additional Invitations</li> </ul> </li> <li>• <b>Conclusion</b></li> </ul>
MPT Meeting No. 2  August 3, 2016  Village of Ruidoso Fire Dept. Station 1 Ruidoso, NM	<ul style="list-style-type: none"> <li>• <b>Welcome and Introductions</b></li> <li>• <b>Summary of First Meeting</b></li> <li>• <b>Review Community Capabilities</b> <ul style="list-style-type: none"> <li>○ Capability Assessment               <ul style="list-style-type: none"> <li>▪ Legal And Regulatory (Codes / Ordinances)</li> <li>▪ Administrative, Technical and Fiscal Capabilities</li> <li>▪ Plans / Manuals / Guidelines / Studies</li> </ul> </li> <li>○ Plan Integration And Incorporation               <ul style="list-style-type: none"> <li>▪ Past Plan Cycle and Future Strategy</li> </ul> </li> </ul> </li> <li>• <b>Risk Assessment</b> <ul style="list-style-type: none"> <li>○ Initial Hazard List Identification</li> <li>○ Critical Facilities And Infrastructure Review And Update</li> <li>○ Initial Data Collection</li> </ul> </li> <li>• <b>Conclusion</b></li> </ul>





MPT photo, HMP 2<sup>nd</sup> meeting

Table 3-2: Summary of planning meetings convened as part of the plan update process	
Meeting Type, Date, and Location	Meeting Agenda
<p>MPT Meeting No. 3</p> <p>August 17, 2016</p> <p>Lincoln County EOC 1 Conference Room Capitan, NM</p>	<ul style="list-style-type: none"> <li>• <b>Summary of Second Meeting</b></li> <li>• <b>Task Assignment Status Review</b> <ul style="list-style-type: none"> <li>• Community Capabilities</li> </ul> </li> <li>• <b>Hazard Event Profiles</b></li> <li>• <b>Risk Assessment</b> <ul style="list-style-type: none"> <li>• Review Hazard Profile Data and Mapping</li> <li>• Historic Hazard Database Review</li> <li>• PRI Analysis spreadsheet</li> <li>• Community Assessment spreadsheet</li> <li>• Repetitive Loss Properties</li> <li>• Development Trends                             <ul style="list-style-type: none"> <li>• Past Plan Cycle</li> <li>• Future Development</li> </ul> </li> </ul> </li> <li>• <b>Conclusion</b></li> </ul>
<p>MPT Meeting No. 4</p> <p>August 24, 2016</p> <p>Lincoln County EOC 1 Conference Room Capitan, NM</p>	<ul style="list-style-type: none"> <li>• <b>Summary of Third Meeting</b></li> <li>• <b>Task Assignment Status Review</b> <ul style="list-style-type: none"> <li>• Community Capabilities</li> </ul> </li> <li>• <b>Hazard Event Profiles</b></li> <li>• <b>Risk Assessment</b> <ul style="list-style-type: none"> <li>• Review Hazard Profile Data and Mapping</li> <li>• Historic Hazard Database Review</li> <li>• PRI Analysis spreadsheet</li> <li>• Community Assessment spreadsheet</li> <li>• Repetitive Loss Properties</li> </ul> </li> <li>• <b>Conclusion</b></li> </ul>

<b>Table 3-2: Summary of planning meetings convened as part of the plan update process</b>	
<b>Meeting Type, Date, and Location</b>	<b>Meeting Agenda</b>
<p>MPT Meeting No. 5</p> <p>September 14, 2016</p> <p>Lincoln County EOC 1 Conference Room Capitan, NM</p>	<ul style="list-style-type: none"> <li>• <b>Task Assignment Status Review</b></li> <li>• <b>Mitigation Strategy – Goals And Objectives</b></li> <li>• <b>Mitigation Strategy – Actions/Projects</b> <ul style="list-style-type: none"> <li>• Action/Project Identification</li> <li>• Implementation Strategy</li> </ul> </li> <li>• <b>Plan Maintenance Strategy</b> <ul style="list-style-type: none"> <li>• Monitoring and Evaluation</li> <li>• Plan Update Schedule</li> <li>• Continued Public Involvement</li> </ul> </li> <li>• <b>Conclusion</b></li> </ul>
<p>MPT Meeting No. 6</p> <p>October 27, 2016</p> <p>Lincoln County EOC 1 Conference Room Capitan, NM</p>	<ul style="list-style-type: none"> <li>• <b>HMP Update review w/DHSEM</b></li> <li>• <b>Questions and Answers</b></li> <li>• <b>Conclusion</b></li> </ul>
<p>Lincoln County LPT Meeting</p> <p>April 3, 2017</p> <p>Lincoln County EOC 1 Conference Room Capitan, NM</p>	<ul style="list-style-type: none"> <li>• <b>Finalize Jurisdictional Hazards and Mitigation Actions/Projects</b></li> <li>• <b>Update Critical Facilities</b></li> </ul>
<p>Town of Capitan LPT Meeting</p> <p>April 11, 2017</p> <p>Capitan Village Hall Capitan, NM</p>	<ul style="list-style-type: none"> <li>• <b>Finalize Jurisdictional Hazards and Mitigation Actions/Projects</b></li> <li>• <b>Update Critical Facilities</b></li> </ul>
<p>Town of Carrizozo LPT Meeting</p> <p>April 11, 2017</p> <p>Carrizozo Town Hall Carrizozo, NM</p>	<ul style="list-style-type: none"> <li>• <b>Finalize Jurisdictional Hazards and Mitigation Actions/Projects</b></li> <li>• <b>Update Critical Facilities</b></li> </ul>

Table 3-2: Summary of planning meetings convened as part of the plan update process	
Meeting Type, Date, and Location	Meeting Agenda
Village of Corona LPT  April 12, 2017  Corona Public Library Corona, NM	<ul style="list-style-type: none"> <li>• <b>Finalize Jurisdictional Hazard and Mitigation Actions/Projects</b></li> <li>• <b>Update Critical Facilities</b></li> </ul>
Village of Ruidoso and City of Ruidoso Downs LPT Meeting  April 19, 2017  Village of Ruidoso Fire Dept. Station 1 Ruidoso, NM	<ul style="list-style-type: none"> <li>• <b>Finalize Jurisdictional Hazards and Mitigation Actions/Projects</b></li> <li>• <b>Update Critical Facilities</b></li> </ul>



HMP 3<sup>rd</sup> Meeting, MPT, photo

### 3.3.4 Stakeholders Participation

The planning process used to develop the 2012 Plan included participation from several agencies and organizations which operate within or have jurisdiction over small and large areas of Lincoln County. For this update, a list of known and/or potential stakeholders not already involved in the MPT was brainstormed and compiled at both the internal kickoff meeting and MPT Meeting No.1. Invitations were sent to the identified list via emails requesting their participation. Personal invitations by Cody Thetford, Interim Village of Ruidoso Fire Chief, and Joe Kenmore, Lincoln County Emergency Director were also extended to agencies to participate in the planning meetings. In addition to the personal invitations, a broader invitation to all citizens within and near Lincoln County was indirectly extended via website postings, which are discussed more thoroughly in Section 3.4.2. This approach was considered the best way to reach interested non-profits and businesses within the County and provide them an opportunity for participation in the planning process.

Table 3-3 represents the list of all entities (except the participating jurisdictions) that were directly invited, and an asterisk\* represents the agency that responded and participated in meetings:

<b>Table 3-3: List of stakeholders invited or participated in the planning process</b>	
<b>Agency / Organization</b>	<b>Contact Position</b>
USFS	Anthony Sanchez *
Mescalero Apache Tribe	Danny Breuninger, President
Bureau of Land Management	Kyle Arnold
NM State Land, Forestry Division	Javier Anderson SF, Les Owens, NMSLO
Otero County	Pamela Heltner, County Manager
Chavez County	Stanton Riggs, County Manager
Socorro County	Fred Hollis, County Manager
DeBaca County	Emergency Management
Torrance County	Javier Sanchez, Emergency Manager
Guadalupe County	Emergency Management

Photo of Joe Kenmore, Lincoln County Emergency Manager, showing Lincoln County is Storm Ready, certified by National Weather Service (NWS).



An integral part of the planning process included coordination with agencies and organizations outside of the participating jurisdiction's governance to obtain information and data for inclusion into the Plan or to provide more public exposure to the planning process. Much of the information and data that is used in the risk assessment is developed by agencies or organizations other than the participating jurisdictions. In some cases, the jurisdictions may be members of a larger organization that has jointly conducted a study or planning effort like the development of a community wildfire protection plan, participation in an area association of governments, or participation in a FEMA RiskMAP Discovery study. Examples of those data sets include the FEMA floodplain mapping, community wildfire protection plans, severe weather statistics, hazard incident reports, and regional comprehensive plans. The resources obtained, reviewed and compiled into the risk assessment are summarized in Section 3.6 and at the end of each subsection of Section 5.3 of this Plan. Jurisdictions needing these data sets obtained them by requesting them directly from the host agency or organization, downloading information posted to website locations, or engaging consultants.

### **3.4 Public Involvement**

#### **3.4.1 Previous Plan Assessment**

The public involvement strategy for the 2012 Plan development included the publishing of public notices, including a link to the full-time website maintained on the Lincoln County servers.



Lincoln County conducted multiple public meetings with the primary public meeting being a County Board of Commissioners meeting on September 15, 2009. Board of Commissioners meetings are a standard venue for providing opportunities for public participation and comment on issues of concern to the community. All Board meetings are open to the public and publicly noticed with published agendas.

### 3.4.2 Plan Update

For all intents of purposes, the MPT defines “public” as the community of Lincoln County and surrounding counties and Tribes; residents, local homeowners, 2<sup>nd</sup> homeowners, renters, and businesses and organizations outside of government.

The opportunity for public involvement and input to the plan update process was accommodated using the general strategy as the 2012 Plan; all incorporated jurisdictions, Village of Ruidoso, City of Ruidoso Downs, Town of Carrizozo, Village of Capitan, and Village of Corona, followed Lincoln County’s lead. Participating jurisdictions posted public notices to their respective websites that included a link to the full time website maintained on the Village of Ruidoso website. A copy of the 2012 Plan was made available on the County website along with contact information for the MPT Primary Point of Contact (PPOC). Social media such as Facebook and Twitter were used by several jurisdictions to get the word out.

A second phase of public notices was posted to jurisdictional websites and a copy of the draft Plan was posted to the County website for review and comment, although throughout the entire HMP update process public feedback was not received in any of the participating jurisdictions. Interested citizens were also encouraged to participate in the local community adoption process.

## 3.5 Reference Documents and Technical Resources

Over the course of the update planning process, numerous other plans, studies, reports, and technical information were obtained and reviewed for incorporation or reference purposes. The majority of sources referenced and researched pertain to the risk assessment and the capabilities assessment. To a lesser extent, the community descriptions and mitigation strategy also included some document or technical information research. Table 3-4 provides a reference listing of the primary documents and technical resources reviewed and used in the Plan. Detailed bibliographic references for the risk assessment are provided at the end of each hazard riskprofile in Section 5.3. Other bibliographic references are provided as footnotes throughout the Plan.

<b>Table 3-4: List of resource documents and references reviewed and incorporated in the HMP update process</b>		
<b>Referenced Document or Technical Source</b>	<b>Resource Type</b>	<b>Description of Reference and Its Use</b>
State of New Mexico Hazard Mitigation Plan (2015)	Hazard Data Mitigation Data	Some of the hazard data and mitigation information published in the State Plan are incorporated into the Plan update.
New Mexico Forestry Division	Hazard Data	Source for wildfire data associated with State Land

<b>Table 3-4: List of resource documents and references reviewed and incorporated in the HMP update process</b>		
<b>Referenced Document or Technical Source</b>	<b>Resource Type</b>	<b>Description of Reference and Its Use</b>
Bureau Net (2015)	Website Database	Source for NFIP statistics.
Comprehensive Floodplain Management Plan	Technical and Planning Resource	The Lincoln County Comprehensive Floodplain Management Plan is a source for flooding data and mitigation strategies envisioned for the areas served by the County.
Federal Emergency Management Agency	Technical and Planning Resource	Resource for HMP guidance (How-To series), floodplain and flooding related NFIP data (mapping, repetitive loss, NFIP statistics), and historic hazard incidents. Used in the risk assessment and mitigation strategy.
U.S. Global Change Research Program	Technical and Data Resource	Source for National Climate Assessment reports and documentation with discussions on climate change.
U.S. Census Bureau	Data Resource	Source and demographic information
Lincoln County All Hazard Mitigation Plan (2012)	Hazard Mitigation Plan	FEMA approved hazard mitigation plan that became the starting point for the update process.
Lincoln County Community Wildfire Protection Plan (2014)	CWPP	Source for wildfire history and risk data.
National Climatic Data Center	Technical Resource	Online resource for weather related data and historic hazard event data. Used in the risk assessment.
Maricopa County HMP 2015	HMP Resource	Source for HMP reference
National Response Center	Technical Resource	Source of traffic related HAZMAT incidents and rail accidents. Used in the risk assessment.
National Weather Service	Technical Resource	Source for hazard information, data sets, and historic event records.
U.S. Census Bureau	Technical Data	County census block data was used to obtain block boundaries, population, and housing units
U.S. Forest Service	Technical Data	Source for local wildfire data.
U.S. Geological Survey	Technical Data	Source for geological hazard data and incident data.
Jurisdictional Master Plans	Planning and Hazard Data	General Plans prepared by each of the various jurisdictions summarizes the long-term growth strategies and can provided data regarding development trends.



Photos: MPT using the Lincoln County Simtable to simulate wildfire and flooding scenarios.

### 3.6 Plan Integration into Other Planning Mechanisms

Incorporation and/or integration of the Plan into other planning mechanisms, either by content or reference, enhances a community's ability to perform hazard mitigation by expanding the scope of the Plan's influence. It also helps a community to capitalize on all available mechanisms at their disposal to accomplish hazard mitigation and reduce risk.

#### 3.6.1 Past Plan Incorporation/Integration Assessment

Lincoln County was the only jurisdiction to reveal the assessment of incorporating the 2012 Plan elements into other planning programs over the past planning cycle.

#### 3.6.2 Five Year Plan Integration/Incorporation Strategy

With the efficacy of integrating the 2012 Plan during the last cycle in view, the MPT identified typical ways to use and incorporate the Plan over the next five-year planning cycle, as follows:

- Use of, or reference to, Plan elements in updates/revisions to codes, ordinances, general and/or comprehensive planning documents, and other long-term strategic plans.
- Integration of defined mitigation Actions/Projects (A/P) into capital improvement plans and programming.

- Reference to Plan risk assessments during updates or revisions to land use planning and zoning maps.
- Resource for developing and/or updating emergency operations plans, community wildfire protection plans, emergency response plans, etc.
- Reference during grant application processes.
- Use of the Plan as a resource during LEPC meetings.

Specific opportunities for integrating and/or referencing the Plan into other planning mechanisms over the next five years are summarized by jurisdiction in Tables 3-5. In all cases, the jurisdiction's PPOC will take responsibility to ensure that the Plan, risk assessment, goals and mitigation strategies are integrated and/or incorporated into the listed planning mechanism by participating in those efforts as they occur.

<b>Table 3-5: Plan integration history and future strategy for Lincoln County</b>	
<b><u>Plan Integration Over the Past Plan Cycle:</u></b> Plan integration for Lincoln County has been incorporated into the County's CWPP.	
<b>Plan Integration Strategy for Next Five Years:</b>	
<b>Planning Mechanism</b>	<b>Description of Planning Mechanism Opportunity</b>
Lincoln County Emergency Operations Plan (EOP)	The EOP identifies response and recovery actions in Lincoln County, and is reviewed and updated annually. The EOP will include integration of risk assessment data from the HMP.
County Master Plan (CMP)	The hazards identified within this study will be referenced within the applicable development areas.
Capital Improvement Program (CIP)	Integration of the HMP mitigation actions and projects between the CIP's and the HMP will be part of the process.
Community Wildfire Protection Plan (CWPP)	The CWPP identifies at risk communities within or near the wildland/urban interface. The HMP contributes historical evidence for mitigation of fires within the CWPP interface.

<b>Table 3-5: Future plan integration strategy for Village of Ruidoso</b>	
<b>Plan Integration Strategy for Next Five Years:</b>	
<b>Planning Mechanism</b>	<b>Description of Planning Mechanism Opportunity</b>
Village of Ruidoso Emergency Operations Plan (EOP)	The Emergency Operations Plan (EOP) has been devised to provide effective emergency operations within the Village of Ruidoso using the governmental organizations and resources to the full extent. Any revision of the EOP will reference the HMP.

Capital Improvement Program (CIP)	The HMP can be utilized to inform and guide the submittal and funding of CIP projects on an annual basis.
Community Wildfire Protection Plan (CWPP)	Development of this HMP allows the Village of Ruidoso to look at areas of wildland/urban interface, giving the opportunity to focus on which projects to include in the priority listing that best minimizes the possibility of fires in the community. The HMP and CWPP will continue to be integrated to share risk assessment and mitigation data.
Community Master Plan (CMP)	Integration of the HMP with future updates of the Community Master Plan will provide additional input into the identification of problematic areas and address possible areas of mitigation interest. The HMP will serve as a reference source during all amendments to the CMP.

**Table 3-5: Future plan integration strategy for City of Ruidoso Downs**

<b>Plan Integration Strategy for Next Five Years:</b>	
<b>Planning Mechanism</b>	<b>Description of Planning Mechanism Opportunity</b>
Emergency Operations Plan (EOP)	Review and amend plan as needed for sections that address al Hazard Mitigation procedures.
Capital Improvement Program (CIP)	Provide the information needed from the hazard mitigation standpoint to identify areas where CIP funds may be utilized in projects, i.e. infrastructure repair.
Community Master Plan (CMP)	Under the Community Master Plan, future reviews/amendments are anticipated and the HMP will be referenced and integrated as appropriate.

**Table 3-5: Future plan integration strategy for Town of Carrizozo**

<b>Plan Integration Strategy for Next Five Years:</b>	
<b>Planning Mechanism</b>	<b>Description of Planning Mechanism Opportunity</b>
Emergency Operations Plan (EOP)	The Town of Carrizozo's EOP is planning for response to and mitigation to potential disasters. The EOP and HMP share common risk assessment elements and will continue to be integrated.
Community Master Plan (CMP)	The HMP will be reviewed and utilized in the coordination of any CMP revisions.
Communication Plan (CP)	The HMP will serve as a reference for the identification of future CP updates.

<b>Table 3-5: Future plan integration strategy for Village of Capitan</b>	
<b>Plan Integration Strategy for Next Five Years:</b>	
<b>Planning Mechanism</b>	<b>Description of Planning Mechanism Opportunity</b>
Emergency Operations Plan (EOP)	When the EOP will be revised, the plan's elements will be either reference or incorporate the goals, risks, and mitigation actions/projects of the HMP.
Community Master Plan (CMP)	With updates to the CMP, having the hazard mitigation plan in place as a reference for overall impact of growth to the community.
Communications Plan (CP)	The CP is an outline for developing and maintaining present and future communication needs of the community. These needs will utilize the HMP for future communication projects.

<b>Table 3-5: Future plan integration strategy for Village of Corona</b>	
<b>Plan Integration Strategy for Next Five Years:</b>	
<b>Planning Mechanism</b>	<b>Description of Planning Mechanism Opportunity</b>
Emergency Operations Plan (EOP)	The EOP and HMP share common risk assessment elements and will continue to be integrated.
Community Master Plan (CMP)	Community's Master Plan will support further integration of the HMP.
Capital Improvement Program (CIP)	The CIP's revision will reference the HMP.
Communications Plan (CP)	The HMP will serve as a basis for updating the community's CP.

### 3.6.3 Plan Incorporation Process

Each jurisdiction has particular processes that are followed for officially incorporating and adopting planning documents and tools. Many of the processes and procedures are similar for jurisdictions with comparable government structures.

In general, planning documents prepared by the various departments or divisions of a particular jurisdiction are developed using an appropriate planning process that is overseen and carried out by staff, with the occasional aid of consultants. Each planning process is unique to

the plan being developed, but all usually involve the formation of a planning or steering committee, and have some level of interagency/stakeholder coordination within the plan's effective area. Public involvement may also be incorporated when appropriate and depending on the type of plan. New or updated plans are usually developed to a draft stage wherein they are presented to the respective governing body for initial review and comment. Upon resolution and address of all comments, which may take several iterations, the plans are then presented to the governing body for final approval and official adoption.

Integration or reference to the Plan into these various processes will be accomplished by the active participation of the MPT Primary Point of Contact (PPOC) representative(s) from each jurisdiction, in the other planning teams or committees to ensure that the Plan risk assessment, goals, and mitigation A/Ps are integrated and/or incorporated into the planning mechanism as appropriate.

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## SECTION 4: COMMUNITY DESCRIPTIONS

### 4.1 General

The purpose of this section is to provide updated basic background information on Lincoln County as a whole and includes information on geography, climate, population and economy. Abbreviated details and descriptions are also provided for each participating jurisdiction.

### 4.2 County Overview

#### 4.2.1 *Location and Geography*

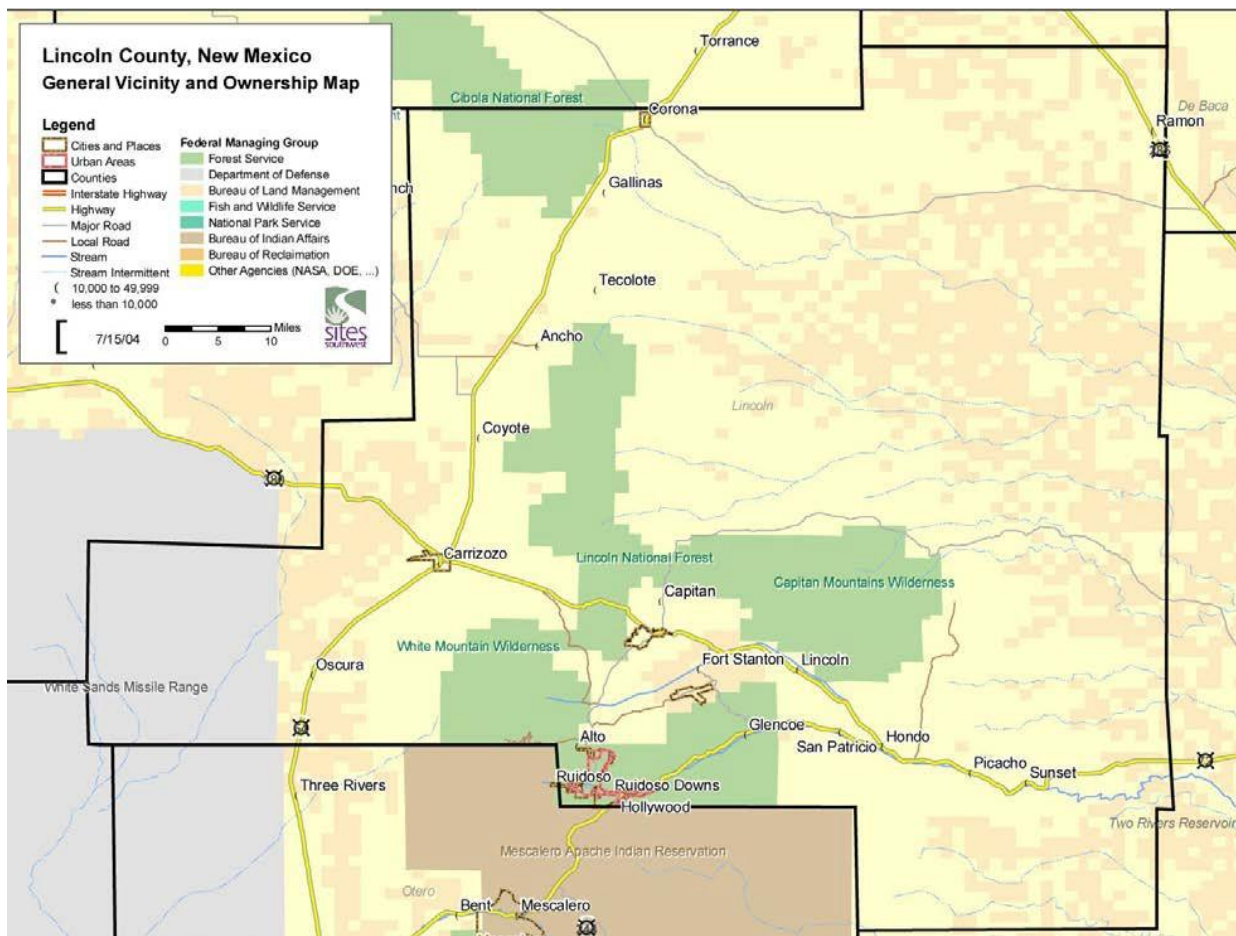
Lincoln County is located in south central New Mexico. Lincoln County is bordered Torrance and Guadalupe Counties to the North, De Baca County to the Northeast, Chaves County to the East, Otero County to the South, Sierra County to the Southwest, and Socorro County to the West (see Figure 1). Named after Abraham Lincoln, the County was established in 1869. At that time, it made up nearly one fourth of the entire state and was the largest county in the United States. Today it comprises 4,858 square miles which range from sprawling ranch lands to mountain settings. Important natural features in Lincoln County include the Lincoln National Forest, Sacramento Mountains, Capitan Mountains, Bonito Lake, and the Valley of Fires lava fields.

Lincoln County also has a rich history. It lays claim to some of the most well-known figures of the West, including Billy the Kid and Smokey Bear. The County is also dotted with ghost towns and artists' enclaves, as well as the resort town of Ruidoso.

There are three primary roadways that serve Lincoln County: US routes 380, 70, and 54. Route 380 bisects the County, running east to west. It connects Interstate 25 to Carrizozo, through Hondo, and eventually goes to Roswell and Texas. Route 70 runs southwest to northeast, connecting Las Cruces, Alamogordo, and Tularosa to Ruidoso before joining route 380 in Hondo. Route 54 is a north-south roadway, which runs from El Paso, through Carrizozo, north to Corona, and continues northeast through several states. There are several small airports throughout the County, including the Carrizozo and Ruidoso Municipal Airports. From Carrizozo, the nearest metropolitan center is Las Cruces, which lies 124 miles to the southwest. Albuquerque is 152 miles to the northwest, while Santa Fe, the state capital, is about 162 miles to the north.<sup>1</sup> The terrain in Lincoln County varies from relatively flat prairie lands and rolling foothills to high mountain peaks. It is a rugged region in the Basin and Range Province, with green hills and large plains surrounding and separating high mountain ranges. The plains are eroded, with canyons and the beds of dry streams; the tree-covered mountains include the Sierra Blanca, Sierra Oscura, Gallinas (with 8,615-foot Gallinas Peak), Jicarilla (with 9,650-foot Carrizo Mountain), and Capitan (with 10,083-foot Capitan Peak). Much of southwestern Lincoln County is covered by the Malpais, a region of lava beds that originated from Little Black Peak.

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<sup>1</sup> Lincoln County Comprehensive Plan 2007



Retrieved from <http://www.britannica.com/EBchecked/topic/341673/Lincoln>

#### 4.2.2 Climate

Summertime high temperatures range in the 80s Fahrenheit (°F) with lows in the 40s and 50s °F. Winter temperatures vary from highs in the upper 40s and 50s °F; lows in the 20s °F. The assessment area has over 300 days of sunshine per year. Average annual precipitation is 23 inches around Ruidoso and 15 inches around Corona. The majority of precipitation is received during summer months. Annual average snowfall in Ruidoso is 35.5, Capitan 30.7, and Corona 26.7 inches, respectively. According to the most updated climate data from the National Centers for Environmental Information and National Oceanic Atmospheric Administration (NOAA), Table 4-1 below shows the jurisdictional average monthly climate summary obtained from weather stations that are only located in Ruidoso, Capitan, Carrizozo, and Corona. Available updated data per weather station varies from 2010-2013.

**Table 4-1 Average Monthly Climate Summary for the Village of Ruidoso, Village Capitan,  
Village of Corona and Town of Carrizozo**

Climate Attribute	Month												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Ruidoso (January 2007 – December 2011)													
Average Temperature (°F)	35	38	45	51	57	65	67	67	61	53	44	37	52
Average Total Precipitation (inches) 2010	1.6	0.8	1.0	0.7	1.9	2.0	6.4	3.1	2.6	1.0	0.4	1.5	23
Capitan (January 2007 – December 2013)													
Average Temperature (°F)	35	39	47	53	60	70	69	69	63	55	45	36	53
Average Total Precipitation (inches) 2011	0.6	0.4	0.5	0.4	1.0	0.7	4.8	2.0	1.8	0.6	0.2	1.0	14
Corona (January 2007 – December 2012)													
Average Temperature (°F)	33	36	43	49	57	69	69	70	64	54	44	34	52
Average Total Precipitation (inches) 2010	0.5	0.6	0.8	0.7	1.5	0.7	3.5	2.3	2.5	1.3	0.3	0.8	15.5
Carrizozo (January 2007 – December 2010)													
Average Temperature (°F)	35	41	49	55	63	73	74	73	67	57	44	38	56
Average Total Precipitation (inches) 2010	0.5	0.6	0.3	0.6	1.1	0.7	3.3	1.2	1.2	1.1	0.8	0.8	12.2

Source: Annual Climatological Summary from National Centers for Environmental Information

#### *4.2.3 Population*

According to the 2016 United States Census population estimates for Lincoln County and its incorporated jurisdictions, there were 19,429 people. For 2015, the population was 19,420 and 8,479 households, residing in the county. The population density was 4.2 inhabitants per square mile (1.6/km<sup>2</sup>). The racial makeup of the county was 63.5% white, 3.9% American Indian, 1.1% black or African American, 0.5% Asian, 31.7% Hispanic, and 1.5% from two or more races.

In the county the population was spread out with 18.3% under the age of 18, and 27.3% who were 65 years of age or older. The median age was 49.4 years old. 50.3% females and 49.7% males.<sup>1</sup>

#### *4.2.4 Economy*

Important economic values are year-round recreational resort facilities, tourism, historical communities and buildings, Ruidoso Downs, site seeing, nearby Mescalero Apache Reservation, and retirement communities. Ecological values include such things as watersheds, wildlife and aquatic habitats, rangeland grazing, forest products, and view sheds. The Bonito and other watersheds are water sources for communities inside and outside of the county. Important infrastructure includes such things as U.S. Highways (54, 70, 285, and 380), county roads, a railroad, communication towers, communities, watersheds, ski area, and historical communities.

Services, retail trade, and construction provided the most number of jobs in Lincoln County in the past. Major employers include several companies in the hospitality and recreation industry, the health care sector, construction, as well as local government.

The Mescalero Apache tribe is the largest employer of Lincoln County residents, though it is actually located in Otero County, bordering Ruidoso to the south. The tribe provides up to 1,500 jobs, depending on the season, for the operation of the Inn of the Mountain Gods hotel, golf course, and casino and the Ski Apache resort. The nearby Ruidoso Downs Racetrack and the Billy the Kid Casino together provide an additional 600 to 1,250 jobs.

The local government and related services are other important sources of jobs. Ruidoso Municipal Schools has 452 employees, while the Village of Ruidoso provides 200 jobs, and Lincoln County provides 115. Meanwhile, the Lincoln County Medical Center employs nearly 250 people. Finally, the Wal-Mart Super Center, located in Ruidoso Downs, has the capacity to employ up to 350 people, and Sierra Blanca Constructors provides between 100 and 250 jobs.

Tourism is also a major part of the economy of Lincoln County. Visitors are drawn to the cultural and historic significance of the County, which lays claim to Billy the Kid and Smokey Bear, as well as the natural beauty and associated recreational activities such as skiing, hiking, and fishing. Lincoln County is well-known for its “Wild West” heritage, specifically the so-called Lincoln County War of 1878, which led rise to the gunslinger Billy the Kid and his famed escape from the Lincoln County Courthouse in 1881. Visitors can learn about these events during Old Lincoln Days, held in August in the town of Lincoln. This one-street town is a National Historical Landmark, and

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<sup>1</sup> United States Census Bureau

several of its buildings make up the Lincoln State Monument. The Billy the Kid National Scenic Byway is an 84-mile loop through Lincoln County, connecting historic places such as Lincoln and Fort Stanton with the larger towns of Ruidoso and Ruidoso Downs as well as the smaller villages of San Patricio, Hondo, Capitan, and Alto. There are various tourist attractions along the route.

In Capitan, visitors can learn about Smokey Bear, the national mascot for preventing forest fires, at the Smokey the Bear Museum, the Smokey Bear Historical State Park and its corresponding visitor center, and during the annual Smokey the Bear Stampede, held every July.<sup>2</sup>

### 4.3 Jurisdictional Overviews

The following are brief overviews for each of the participating jurisdictions in the Plan.

#### 4.3.1 Village of Ruidoso

The Village of Ruidoso is a unique community located at 6,000 plus feet in elevation and is tucked right into Sierra Blanca and the surrounding mountains of the Sacramento's. The Village is a tourist destination town which has a permanent population of approximately 9,000 people which can swell to over 30,000 on specific weekends. Because of the physical location of the Village, as well as its seasonal tourist orientation, Ruidoso must proactively address a number of specific issues in order to better control its own fate and enhance its sustainability over the long-term. These issues include land development, infrastructure improvement needs, economic development and diversification, environmental protection, and retaining affordability of the community for all of its citizens and guests, just to name a few. The Village of Ruidoso provides many services, including some not normally found in a small community, such as an airport, library and convention center. These create economic challenges but also enhance the appeal of the area.

The high number of part-time residents also presents challenges for providing and funding infrastructure improvements and general governmental services. The reliance on seasonal tourists for much of the revenue that supports the community means that Ruidoso must be constantly vigilant to identify and make improvements necessary to continue to attract those people to the community. One important tool a municipality has in helping to protect and enhance quality of life within the Village is the Comprehensive Plan.<sup>3</sup>

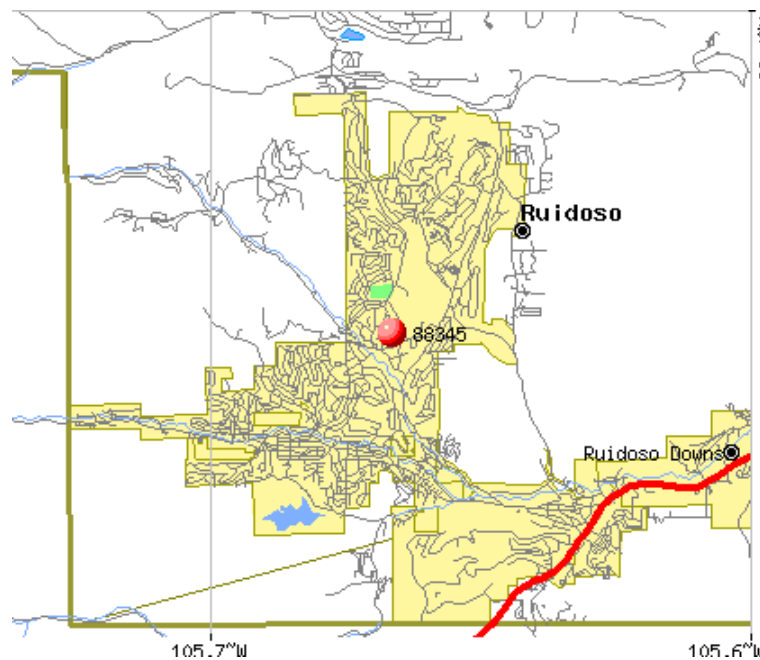


Source: <http://www.skiapache.com/photos-videos/>

<sup>2</sup> Lincoln County Comprehensive Plan 2007

<sup>3</sup> Village of Ruidoso Comprehensive Plan 2010

According to the 2015 U.S. Census, in the Village of Ruidoso the population estimate was 8,029 people. The following U.S. Census information came from 2010, the most recent and updated information available at the time of updating the HMP. Population estimates of 2010 was 8,027, 8,428 housing units total which includes 2,675 owner-occupied and 1,109 renter-occupied, with 882 families residing in the village. The racial makeup of the village was 85.91% White, 0.39% African American, 3.00% Native American, 0.57% Asian, 7.69% from other races, and 2.37% from two or more races. Hispanic or Latino of any race were 27.10% of the population.<sup>1</sup>



Source: Village of Ruidoso Comprehensive Plan 2010

#### 4.3.2 *Capitan*

Ideally located in the heart of historic Lincoln County, Capitan is home to 1,500 friendly residents. A growing residential community, the Village surrounded by cattle ranches is situated between the Capitan and Sacramento Mountains at an elevation of 6,530 feet. Residents and tourists typically enjoy a temperate climate, days filled with brilliant sunshine cooled by the brisk mountain breeze.<sup>2</sup>

Founded in the 1890's, incorporated in 1941, the Village retains its small town country flavor. In spring of 1950, a badly burned black bear cub was rescued from a large forest fire at Capitan Gap in the Capitan Mountains. First called Hotfoot Teddy, he was later renamed Smokey and became the real-life version of the United States Forest Service mascot Smokey Bear. Smokey was later sent to the National Zoo in Washington D.C., where he lived for 26 years. Upon his death on November 9, 1976, Smokey's remains were returned by the government to Capitan

<sup>1</sup> United States Census Bureau

<sup>2</sup> Retrieved from [www.villageofcapitan.com](http://www.villageofcapitan.com)



and buried at what is now the Smokey Bear Historical Park. Buried on the grounds of the Smokey Bear Historical Park is Smokey Bear. The park features fire prevention information, a xeriscape garden with walkable pathways and benches for outdoor enjoyment. A conservation seedling program and a re-leaf program are sponsored at the site by the NM State Forestry Division.<sup>1</sup>

According to the 2015 U.S. census, there were 1,392 people. The following U.S. census information came from 2010, the most recent and updated information available at the time of updating the HMP. Population estimate for 2010, was 1,489 people, 804 households, and 176 families residing in the village. The population density was 450.9 people per square mile (174.1/km<sup>2</sup>). There were 1,186 housing units at an average density of 224.0 per square mile (86.5/km<sup>2</sup>). The racial makeup of the village was 84.35% White, 0.47% African American, 0.94% Native American, 0.067% Asian, 10.81% from other races, and 3.35% from two or more races. Hispanic or Latino of any race were 24.78% of the population.<sup>2</sup>



Source: [https://en.wikipedia.org/wiki/Smokey\\_Bear](https://en.wikipedia.org/wiki/Smokey_Bear)

#### 4.3.3 *Ruidoso Downs*

The first home in the area of what would be present day Ruidoso Downs was built in the 1880s by Lowery Hale. Mr. Hale owned most of the land in the area and acquired over 800 acres. The early 1900s saw the construction of the two-story White Mountain Inn on the banks of Rio Ruidoso. A man named J.V. or Rev. S.M. Johnson built the Inn, and this originally was the only business in the area. The Johnson family also operated a general store, post office, and dance hall.

<sup>1</sup> Retrieved from [www.smokeybearpark.com](http://www.smokeybearpark.com)

<sup>2</sup> United States Census Bureau

The mid 1930s saw the opening of Turner's Tavern, a saloon, and filling station, followed by a garage and general mercantile store that later became Fox Merchandise. The first community sawmill was started by Ed Hoagland in 1936. Timber played an important part of the City's development until heavy cutting decimated the area's timber resources.

The original town site was laid out in 1933, and the community was named Palo Verde. The name did not last long, and with opening of the post office in 1947, the U.S. Postal Administration changed the town's name to Green Tree. At this time, Green Tree was incorporated as a Village largely due to the need for a reliable community water system. It wasn't until 1958 that City residents voted to change by special election the name to Ruidoso Downs, and not until 1961 that the town officially became Ruidoso Downs with the opening of the new post office.

The Ruidoso Downs Racetrack opened in 1946 and became an instant attraction for Texans who were cashing in on the oil boom. The All American Futurity, the world's most prestigious and richest quarter horse race, debuted in 1958. The Billy the Kid Casino at the east end of the racetrack opened in 2000. Despite these tourist attractions, Ruidoso Downs maintains a small town atmosphere which is highly valued by its residents. Ruidoso Downs is well known throughout the southwest and Texas as a community with the friendliest people.<sup>1</sup>

According to the 2015 U.S. Census, there were 2,586 people, 949 households, and 610 families residing in the city. The following U.S. Census information came from 2010, the most recent and updated information available at the time of updating the HMP. Population estimate for 2010, was 2,815 people. The racial makeup of the city was 73% White, 1.0% African American, 5.2% Native American, 0.3% Asian, 0.2% from other races, and 2.2% from two or more races. Hispanic or Latino of any race were 50.1% of the population.<sup>2</sup>



Source: [www.discoverruidoso.com](http://www.discoverruidoso.com)

<sup>1</sup> City of Ruidoso Downs Comprehensive Plan 2004

<sup>2</sup> United States Census Bureau



#### 4.3.4 Carrizozo

Carrizozo, New Mexico is a small town near the geographic center of the state. It is located at the crossroads of Highways 54 and 380, about 50 miles north of Alamogordo, and is the county seat of Lincoln County. Founded in 1899, the town provided the main railroad access for Lincoln County, and the town experienced significant population growth in the early decades of the 1900s. However, with declining relevance of the railroad, the population of the town has gradually declined.<sup>9</sup>

The location of Carrizozo was selected as the site for a station on the El Paso and Northeastern Railway (EP&NE) main line in 1899. Carrizozo was chosen over the nearby booming mine town of White Oaks, New Mexico, resulting in large-scale migration from White Oaks to Carrizozo. The railroad brought businesses, growing populations, and increased importance to the town of Carrizozo. As a result, a county referendum in 1909 moved the county seat of Lincoln County from the town of Lincoln to Carrizozo.<sup>1</sup>

Modern Carrizozo is a scenic small town of about one thousand people — half the population it had at its peak — nestled at the crossroads of Highways 54 and 380. It rests on the northern lip of the Tularosa basin, in a region where the ecology changes very rapidly. The town lies at an elevation of 5400 feet (1.6 km), and as you head north the transition from desert basin to high plains grassland is very fast. Beyond the scarce man-made entertainment, there is Carrizozo's most famous attraction, The Valley of Fires. It is the youngest lava flow in the continental United States (only one or two thousand years old), and is also the youngest example of frequent volcanism that occurred along the Rio Grande rift.<sup>2</sup>

According to the 2015 U.S. Census, there were 934 people residing in the town. The following U.S. Census information came from 2010, the most recent and updated information available at the time of updating the HMP. Population estimates in 2010 were 996. The racial makeup of the town was 78.71% White, 0.70% African American, 2.61% American Indian, 14.16% Other, and 3.82% identified as two or more. Hispanics of any race were 43.57% of the population. 54.72% of the population were men, 45.28% were women. 15.96% were under the age of 18, 24.50% were over 65, and 59.54% were between 18 and 65.<sup>3</sup>



Source:[https://commons.wikimedia.org/wiki/Category:Valley\\_of\\_Fire](https://commons.wikimedia.org/wiki/Category:Valley_of_Fire)

<sup>1</sup> [https://en.wikipedia.org/wiki/Carrizozo,\\_New\\_Mexico](https://en.wikipedia.org/wiki/Carrizozo,_New_Mexico)

<sup>2</sup> [www.carrizozoworks.org](http://www.carrizozoworks.org)

<sup>3</sup> United States Census Bureau

#### 4.3.5 Corona

Corona is a village in Lincoln County, New Mexico, located on U.S. Route 54. Corona was established as a railroad town in 1903 with the building of El Paso and South Western Railroad from Carrizozo to Santa Rosa where it connected to the Rock Island Line. This brought many homesteaders and farmers to the area and initiated the growth of Corona as a trade center, enabling farmers and ranchers to ship their products to market.

In the 1950's, natural gas transmission lines were laid through the area, company housing was built, and some thirty families were employed. Recognized as one of the best in the state, the school has long been the focal point of the community. The School District encompasses parts of three counties and serves an area of 2061 square miles. The stage lines are now gone, the mines are closed; farming is minimal; the railroad depot has been moved; trains no longer stop here and natural gas lines have been automated. Corona is still the trade center for the area; school is still the heart of the community; and Corona is once again, ranching country.

According to the United States Census Bureau of 2015, there were 132 people. The following U.S. Census Bureau information came from 2010, the most recent and updated information available at the time of updating the HMP. Population estimates in 2010 were 172 people, 120 households, and 18 families residing in the village. The population density was 161.4 people per square mile (62.5/km<sup>2</sup>). There were 118 housing units at an average density of 115.4 per square mile (44.7/km<sup>2</sup>). The racial makeup of the village was 92.44% White, 0.5% Native American, 6.97% from other races, and 4.85% from two or more races. Hispanic or Latino of any race were 26.74% of the population.<sup>1</sup>



Source: Corona aerial photo, Google Earth.

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<sup>1</sup> United States Census Bureau

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## SECTION 5: HAZARD IDENTIFICATION AND RISK ASSESSMENT

**§201.6(c)(2):** *[The plan shall include...] (2) A **risk assessment** that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards. The risk assessment shall include:*

- (i) A description of the type, location, and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.*
- (ii) A description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community. The plan should describe vulnerability in terms of:*
  - (A) The types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas;*
  - (B) An estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate;*
  - (C) Providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.*
- (iii) For multi-jurisdictional plans, the risk assessment section must assess each jurisdiction's risks where they vary from the risks facing the entire planning area.*

Risk assessment is a main aspect to the hazard mitigation planning process. When performing a risk assessment, the following questions need to be determined, “what” can happen, “when” how often it is likely to happen, and “how bad” the effects can be. The primary elements, according to DMA 2000, of a risk assessment that answer those questions are generally segregated into the following:

- **Hazard Identification and Screening**
- **Hazard Profiling**
- **Assessing Vulnerability to Hazards**

The risk assessment for Lincoln County and participating jurisdictions was performed using a county- wide, multi-jurisdictional perspective, with much of the information gathering and development being accomplished by the MPT. This approach was incorporated because many hazard events would likely affect numerous jurisdictions within a consolidated urban area like Lincoln County, and are rarely relegated to a single jurisdictional boundary. The vulnerability analysis was performed in a way such that the results reflect vulnerability at an individual jurisdictional level, and at a countywide level.

### 5.1 Hazard Identification and Screening

Hazard identification and Screening is the process of analyzing what hazards occur and can potentially occur to a jurisdiction. For this update, the list of hazards identified in the 2012 Plan was reviewed by the MPT, who chose to add a few man-made hazards in addition to the natural hazards listed. To ensure compatibility with the State Plan, the MPT also compared and contrasted the 2012 Plan list to the comprehensive hazard list summarized in the 2013 New Mexico Plan. Table 5-1 summarizes the 2012 Plan and 2013 State Plan hazard lists.

<b>Table 5-1: Summary of Initial Hazard Identification Lists</b>	
<b>2012 Plan Hazard List</b>	<b>2013 State Plan Hazard List</b>
<ul style="list-style-type: none"> <li>• Wildfire</li> <li>• High Wind</li> <li>• Flood</li> <li>• Drought</li> <li>• Thunderstorms</li> <li>• Severe Winter Storms</li> <li>• Dam Failure</li> <li>• Earthquakes</li> <li>• Tornadoes</li> <li>• Hazardous Materials</li> <li>• Extreme Heat</li> </ul>	<ul style="list-style-type: none"> <li>• Dam Failure</li> <li>• Drought</li> <li>• Earthquake</li> <li>• Extreme Heat</li> <li>• Expansive Soils</li> <li>• Flood</li> <li>• High Wind</li> <li>• Landslides</li> <li>• Land Subsidence</li> <li>• Severe Winter Storms</li> <li>• Thunderstorms (Lightning and Hail)</li> <li>• Tornadoes</li> <li>• Volcanoes</li> <li>• Wildland/Wildland-Urban Interface fire</li> </ul>

One tool used in the initial screening process was the historic hazard database referenced in the 2012 Plan. With this update, the 2012 Plan database was reviewed and updated to include declared disaster events and significant non-declared events that have occurred during the last plan cycle. Declared event sources included New Mexico Department of Homeland Security and Emergency Management (NMDHSEM), Federal Emergency Management Agency (FEMA), National Weather Service (NWS), National Oceanic and Atmospheric Administration (NOAA), National Climatic Data Center (NCDC), United States Geological Survey (USGS), and United States Forest Service (USFS). The historic hazard database presented in this plan primarily represent the period of January 2010 to January 2016. Two tables are used in this update to summarize the historic hazard events. Table 5-2 summarizes the state disaster declarations that included Lincoln County. Table 5-3 summarizes Lincoln County hazard events that meet the following selection criteria:

- 1 or more fatalities
- 1 or more injuries
- Any dollar amount in property or crop damages
- Significant event, as expressed in historical records or according to defined criteria above

**Table 5-2: State of New Mexico Natural Hazard Reported Events That Included Lincoln County  
January 2010 to January 2016**

<b>Hazard</b>	<b>No. of</b>	<b>Recorded Losses</b>		
	<b>Reported Events</b>	<b>Fatalities</b>	<b>Injuries</b>	<b>Damage Costs (\$)</b>
Droughts	2331	0	0	\$0
Earthquake	0	0	0	\$0
Extreme Heat	0	0	0	\$0
Expansive Soils	0	0	0	\$0
Floods	530	10	8	\$44,667,000
High Wind	954	0	1	\$7,329,000
Landslides	0	0	0	\$0
Land Subsidence	0	0	0	\$0
Severe Winter Storms	93	0	4	\$402,243,015
Thunderstorms	420	0	1	\$5,978,000
Tornadoes	42	0	1	\$1,083,000
Wildfire	44	0	21	\$60,708,000
Notes: Damage Costs are reported as is and no attempt has been made to adjust costs to current dollar values				

Source: [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)

**Table 5-3: Lincoln County Hazard Recorded Events – January 2010 to January 2016**

<b>Hazard</b>	<b>No. of</b>	<b>Recorded Losses</b>		
	<b>Records</b>	<b>Fatalities</b>	<b>Injuries</b>	<b>Damage Costs (\$)</b>
Drought	164	0	0	\$0
Earthquake	0	0	0	\$0
Extreme Heat	0	0	0	\$0
Flood	25	0	1	\$294,000
High Wind	127	0	0	\$127,000
Severe Winter Storms	8	0	0	\$1,000,000
Thunderstorm	48	0	0	\$76,000
Tornado	4	0	0	\$101,050
Wildfire	5	0	0	\$31,031,000
Notes: Damage Costs are reported as is and no attempt has been made to adjust costs to current dollar values				

Source: [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov)



The culmination of the review and screening process by the MPT resulted in a decision to revise the hazard list on the 2012 Plan for profiling and updating. The following five hazards in the 2012 Plan are listed below with an explanation of why the entire MPT members did not find it necessary to include them in the updated plan.

- **Tornados** –Lincoln County has a sufficient mitigation strategy in place where a Code Red/Reverse 911 is issued to all jurisdictions within the county. Therefore, each MPT member declared this hazard to be property migrated against at this time, but if in the future this changes, the MPT will amend this plan to address this hazard.
- **High Winds** – Over the last five years, there has been no significant impact from high winds; therefore, each MPT member decided to not mitigate this hazard at this time, but will amend the plan if high winds become an issue.
- **Earthquake** – In the history of Lincoln County there has never been an earthquake, so each MPT member did not want to include this hazard at this time, but will amend the plan if an earthquake happens to occur.
- **Extreme Heat** – There has not been any reported extreme heat scenarios in Lincoln County from 2010-2016, so each MPT member did not want to include this hazard at this time, but will amend the plan if this hazard happens to occur with a significant impact.
- **Hazardous Materials** – Hazardous Materials is not considered a natural event, and this plan is only addressing significant natural events; therefore, each MPT member excluded this hazard.

During the update process, each jurisdiction only addressed the hazards that are significant to their community. Updated definitions for each hazard are provided in Section 5.2, and below are lists of specific hazards chosen by each jurisdiction:

#### Lincoln County

- Wildfire
- Flood
- Drought
- Dam Failure
- Severe Weather
  - Thunderstorms
  - Winter Storms

#### Village of Ruidoso

- Wildfire
- Flood
- Drought
- Dam Failure
- Severe Weather
  - Thunderstorms

#### City of Ruidoso Downs

- Wildfire
- Flood
- Drought
- Dam Failure
- Severe Weather
  - Thunderstorms

#### Town of Carrizozo

- Wildfire
- Drought
- Severe Weather
  - Thunderstorms
  - Winter Storms

**Village of Capitan**

- **Wildfire**
- **Drought**
- **Severe Weather**
  - **Thunderstorms**
  - **Winter Storms**

**Village of Corona**

- **Wildfire**
- **Drought**
- **Severe Weather**
  - **Winter Storms**

*5.1.1 Climate Change*

FEMA has currently recommended that jurisdictions should consider the impact that climate change has on natural hazards. Per FEMA, climate change in and of itself may not be a hazard, but it may change the characteristics of the hazards that currently affect the planning area. Again, considering climate change is not required by Federal mitigation planning regulation, but it can provide a better understanding of how risk may change in the future. It was decided that the MPT would consider climate change within the descriptions of existing identified hazards.

It is known that climate change is not only difficult to predict, but it is also highly debated. However, according to the United States Global Change Research Program (USGCRP) there is a growing body of science and research that indicates several climate change trends. Trends that should be considered when evaluating natural hazard vulnerability and risk. The 3<sup>rd</sup> National Climate Assessment (NCA) was released by the USGCRP in May 2014, which is comprised of the latest body of work and science on the climate change topic. The NCA report is divided into regions, and the Southwest region includes the states of Arizona, California, Colorado, Nevada, New Mexico, and Utah. According to the NCA<sup>29</sup>, the Southwest regional climate change impacts noted include increased heat, drought, and insect outbreaks that result in more wildfires, declining water supplies, reduced agricultural yields, health impacts in cities due to heat, and flooding and erosion in coastal areas. In this report, the NCA released the following “5 Key Messages” for the Southwest Region:

1. **Reduced Snowpack and Streamflows:**

The amount of snowpack and streamflow are estimated to decrease in many parts of the Southwest, producing less surface water supply availability.

2. **Threats to Agriculture:**

Drought and extreme weather affect local agriculturally dependent economies. As climate change intensifies, existing growers and farming economies will be displaced.

3. **Increased Wildfire:**

Increased drought and warming will be linked to increased wildfires, impacting the people and ecosystems in Southwest region.

4. **Sea Level Rise and Coastal Damage:**

As the Earth continues to warm, sea levels will continue to rise, increasing coastal damage.



5. Heat Threats to Health:

Threats to public health and public health costs will start to rise due to the projected regional temperature increases.

According to FEMA, climate change should be addressed during mitigation planning because the probability and severity of future hazard events will be affected. In Section 5.2, a brief assessment of the potential effects that current climate change understanding may have on the Plan hazards is provided where appropriate.

## 5.2 Hazard Risk Profiles

The following sections summarize the risk profiles for each of the Plan hazards identified in Section

5.1. For each hazard, the following elements are addressed to present the overall risk profile:

- **Description**
- **Historical Occurrences**
- **Location, Probability, and Extent**
- **Climate Change Impacts**
- **Sources**
- **Profile Maps (if applicable)**

County-wide profile maps are provided at the end of the section (if applicable) and jurisdiction specific maps are included in the Executive Plan Summary for that jurisdiction.

### 5.2.1 Wildfire

#### **Description**

A wildfire is any fire occurring in a wildland area (e.g. grassland, forest, brush land) except for fire under prescription and mitigation. Wildfires are part of the natural management of forest ecosystems, but may also be caused by human factors. According to the National Fire Protection Association (NFPA) over 80% of forest fires are started as a result of negligent human behavior such as smoking in wooded areas or improper extinguishing of campfires. Lightning is the second most common cause for wildfire.

There are three classes of wildland fires: surface fires, ground forest, and crown fires. A surface fire is the most common of these three classes and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire (muck fire) is usually started by lightning or human carelessness and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees.

Wildfires can occur at any time of day and during any month of the year, but the peak fire season in Lincoln County is normally from March through June. The length of the fire season and the peak months vary appreciably from year to year. Land use, vegetation, amount of combustible materials present, and weather conditions such as wind, low humidity, and lack of precipitation are the chief factors in determining the number of fires and acreage burned. Generally, fires are more

likely when vegetation is dry from a winter with little snow and/or a spring and summer with sparse rainfall.

Wildfires are capable of causing significant injury, death, and damage to property. The potential for property damage from fire increases each year as more recreational properties are developed on forested land and more people use these areas. Fires can extensively affect the economy of an area, especially the logging, recreation, and tourism industries, upon which many counties depend. Major direct costs associated with wildfires are the salvage and removal of downed timber and debris and restoration of the burned area. The indirect effects of wildfires can also be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways and the land itself. Soil exposed to intense heat may lose its ability to absorb moisture and support life. If burned out woodlands and grasslands are not replanted quickly, widespread soil erosion, mudflows, and siltation of rivers could result, thereby enhancing flood potential, harming aquatic life, and degrading water quality. Lands stripped of vegetation by wildfires are also subject to increased landslide hazards. The only natural cause of wildfire is lightning; however, human carelessness and arson account for a large portion of all wildfires.

Factors that determine the potential for fire include relative humidity, moisture content of the fuel, atmospheric stability, drought, available energy of the fuel, probability of ignition, rate of spread, and the slope and fuel levels of the area. These factors are taken into account when determining the fire danger for a specific area.

- **Relative humidity.** Relative humidity is the ratio of the amount of moisture in the air to the amount of moisture necessary to saturate the air at the same temperature and pressure. Relative humidity (RH) is expressed in percent. RH is measured directly by automated weather stations or by taking wet and dry bulb readings with a psychrometer and then applying the National Weather Service psychrometric tables applicable to the elevations where the reading were taken.
- **Fuel moisture.** Fuel moistures in live herbaceous (annual and perennial), woody (shrubs, branches, and foliage) fuels, and dry (dead) fuels are calculated and represent approximate moisture content of the fuel. Fuel moisture levels are measured in 1-, 10-, 100-, and 100-hour increments.
- **The Lower Atmosphere Stability Index or Haines Index.** This index is computed from the morning soundings from Radiosonde Observation (RAOB) stations across North America. The index is composed of a stability term and a moisture term. The stability term is derived from the temperature difference at two atmospheric levels. The moisture term is derived from the dew point depression at a single atmosphere level. This index has been shown to correlate with large fire growth on initiating and existing fires where surface winds do not dominate fire behavior. Haines Indexes range from 2 to 6 for indicating the potential for large fire growth:

2	=	Very Low Potential (moist, stable lower atmosphere)
3	=	Very Low Potential
4	=	Low Potential

- 5 = Moderate Potential
- 6 = High Potential (dry, unstable lower atmosphere)

- **Keetch-Byram Drought Index.** This index is used to measure the effects of seasonal drought on fire potential. The actual numeric value of the index is an estimate of the amount of precipitation (in 100ths of inches) needed to bring soil back to saturation (a value of 0 being saturated). The index deals with the top 8 inches of soil profile so the maximum KBDI value is 800 (8 inches), the amount of precipitation needed to bring the soil back to saturation. As the index values increase, the vegetation is subjected to greater stress from moisture deficiency. At higher values, living plants die and become fuel, and the duff/litter layer becomes more susceptible to fire. The KBDI ranges from 0 to 800:

KBDI 0 to 200. Soil moisture and large-class fuel moistures are high and do not contribute much to fire intensity. This is typical of spring dormant season following winter precipitation.

KBDI 200 to 400. A range of 200 to 400 is typical of the late spring, early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.

KBDI 400 to 600. A range of 400 to 600 is typical of late summer, early fall. Lower litter and duff layers actively contribute to fire intensity and will burn actively.

KBDI 600 to 800. This range is often associated with more severe drought with increased wildfire occurrence. Intense, deep-burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels.

- **The Energy Release Component.** This is the estimated potential available energy released per unit area in the flaming front of a fire. The day-to-day variations of the energy release component are caused by changes in the moisture contents of the various fuel classes, including the 1,000-hour time lag class. The energy release component is derived from predictions of the rate of heat release per unit area during flaming combustion and the duration of flaming.
- **The Ignition Component.** The ignition component is a number that relates the probability that a fire will result if a firebrand is introduced into a fine fuel complex. The ignition component can range from zero, when conditions are cool and damp, to 100 on days when the weather is dry and windy. Theoretically, on a day when the ignition component registers a 60, approximately 60% of all firebrands that encounter wildland fuels will require suppression action.
- **The Spread Component.** This is a numerical value derived from a mathematical model that integrates the effects of wind and slope with fuel bed and fuel particle properties to compute the forward rate of spread at the head of the fire. Output is in units of feet per minute. A spread component of 31 indicates a worst-case, forward rate of spread of approximately 31 feet per minute. The inputs required in to calculate the spread component are wind speed, slope, fine fuel moisture (including the effects of green herbaceous plants), and the moisture content of the foliage and twigs of living, woody plants. Since the characteristics through which the fire is burning are so basic in determining the forward rate of spread of the fire front, a unique spread component table is required for each fuel type.

- **Slope and Fuel Levels Matrix.** The International Fire Code Institute combines slope and fuel levels to obtain a susceptibility index, see Table 5-4.

**Table 5-4 Wildfire Susceptibility Matrix**

Fuel Class	Critical Fire Weather Frequency								
	<1 day per year			2-7 days per year			8+ days per year		
	Slope %			Slope %			Slope %		
	<40	41-40	61+	<40	41-40	61+	<40	41-40	61+
Light	M	M	M	M	M	M	M	M	H
Medium	M	M	H	H	H	H	E	E	E
Heavy	H	H	H	H	E	E	E	E	E

Source: International Fire Code Institute January 2000.

Key:

E = Extreme.

H = High

M = Medium

All of these factors are taken into account when determining the fire danger for a specific area. Because these indicators can change daily, the Fire Danger Rating System, see Table 5-5, was created to show in a simple way the relative danger level to the public.

**Table 5-5 Fire Danger Rating System**

Rating	Basic Description	Detailed Description
Class 1: Low Danger (L) Color Code: <b>Green</b>	Fires not easily started	Fuels do not ignite readily from small firebrands. Fires in open or cured grassland may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
Class 2: Moderate Danger (M) Color Code: <b>Blue</b>	Fires start easily and spread at a moderate rate	Fires can start from most accidental causes. Fires in open cured grassland will burn briskly and spread rapidly on windy days. Woody fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel – especially draped fuel -- may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.

**Table 5-5 Fire Danger Rating System**

Rating	Basic Description	Detailed Description
Class 3: High Danger (H) Color Code: <b>Yellow</b>	Fires start easily and spread at a rapid rate	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High-intensity burning may develop on slopes or in concentrations of fine fuel. Fires may become serious and their control difficult unless they are hit hard and fast while small.
Class 4: Very High Danger (VH) Color Code: <b>Orange</b>	Fires start very easily and spread at a very fast rate	Fires start easily from all causes and immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics such as long-distance spotting and fire whirlwinds, when they burn into heavier fuels. Direct attack at the head of such fires is rarely possible after they have been burning more than a few minutes.

Rating	Basic Description	Detailed Description
Class 5: Extreme (E) Color Code: <b>Red</b>	Fire situation is explosive and can result in extensive property damage	Fires under extreme conditions start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high-intensity burning will usually be faster and occur from smaller fires than in the Very High Danger class (4). Direct attack is rarely possible and may be dangerous, except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions, the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens.

Source: <http://www.wfas.net/content/view/34/51/>

**Figure 5- 1 Wildfire Index**

	1	Lowest Intensity	Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.
	1.5		
	2	Lowest Intensity	Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.
	2.5		
	3	Moderate	Flames up to 8 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.
	3.5		
	4	High	Large Flames, up to 30 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.
	4.5		
	5	Highest	Very large flames up to 150 feet in length; profuse short-range spotting, frequent long-range spotting; strong fire-induced winds. Indirect attack marginally effective at the head of the fire. Great potential for harm or damage to life and property.

Source: (<http://www.southernwildfirerisk.com/map/index/public>)

### **Location and Extent per Jurisdiction**

#### **Lincoln County**

New Mexico experiences, on average, 1,947 wildland fires each year that burn an average 126.5 acres apiece (246 thousand acres per year).

The fire regimes in Lincoln County are largely dependent on forest type. Before human settlement, Pinon Juniper woodlands and mixed conifer forests experienced infrequent high

intensity stand replacing fires, while Ponderosa Pine forests experienced more frequent lower intensity fires. Fires have been suppressed for about 100 years, since communities in this area have had the capacity to do so. Human efforts combined with climactic conditions have altered fire regimes and fuel conditions. The county has recently experienced several large wildfires costing millions of dollars in property damage and suppression costs.

Fire intensity and size have been increasing due to the increase of fuels, tree density, large area of continuous fuels and a dry weather cycle. Wildfires have occurred in almost every vegetation type with the county, including grasslands, pinon/juniper forests, ponderosa pine forests, and mixed conifer forests. Fires have been started by both human and natural causes close to homes and roads, as well as isolated undeveloped areas. Most wildfires have been suppressed while still small. But several have grown into large fires. Table 5-6 below lists the large wildfires (>1000 acres) that Lincoln County has experienced since 2000 - 2016. Figure 5-2 The “Base Historic Fires” map shows these fires and additional fires the County has experienced from 1998 - 2017. Many of the historic fires have impacted or come very close to impacting communities and population centers within the county. Per Figure 5-1, the magnitude for wildfire in Lincoln County is anticipated to range from the lowest intensity to the highest intensity (1-5). See Appendix I for wildfire susceptibility base maps.

**Table 5-6 Lincoln County Wildfires (>1000 acres) 2000-2016**

<b>Name</b>	<b>Date</b>	<b>Size (acres)</b>	<b>Structures</b>
Cree	May, 2000	6,500	3
Kokopelli	March, 2002	1,000	29
Peppin	June 2004	64,000	unknown
Donaldson	June, 2011	101,563	1
White	April, 2011	10,000	5
Little Bear	June, 2012	44,330	250

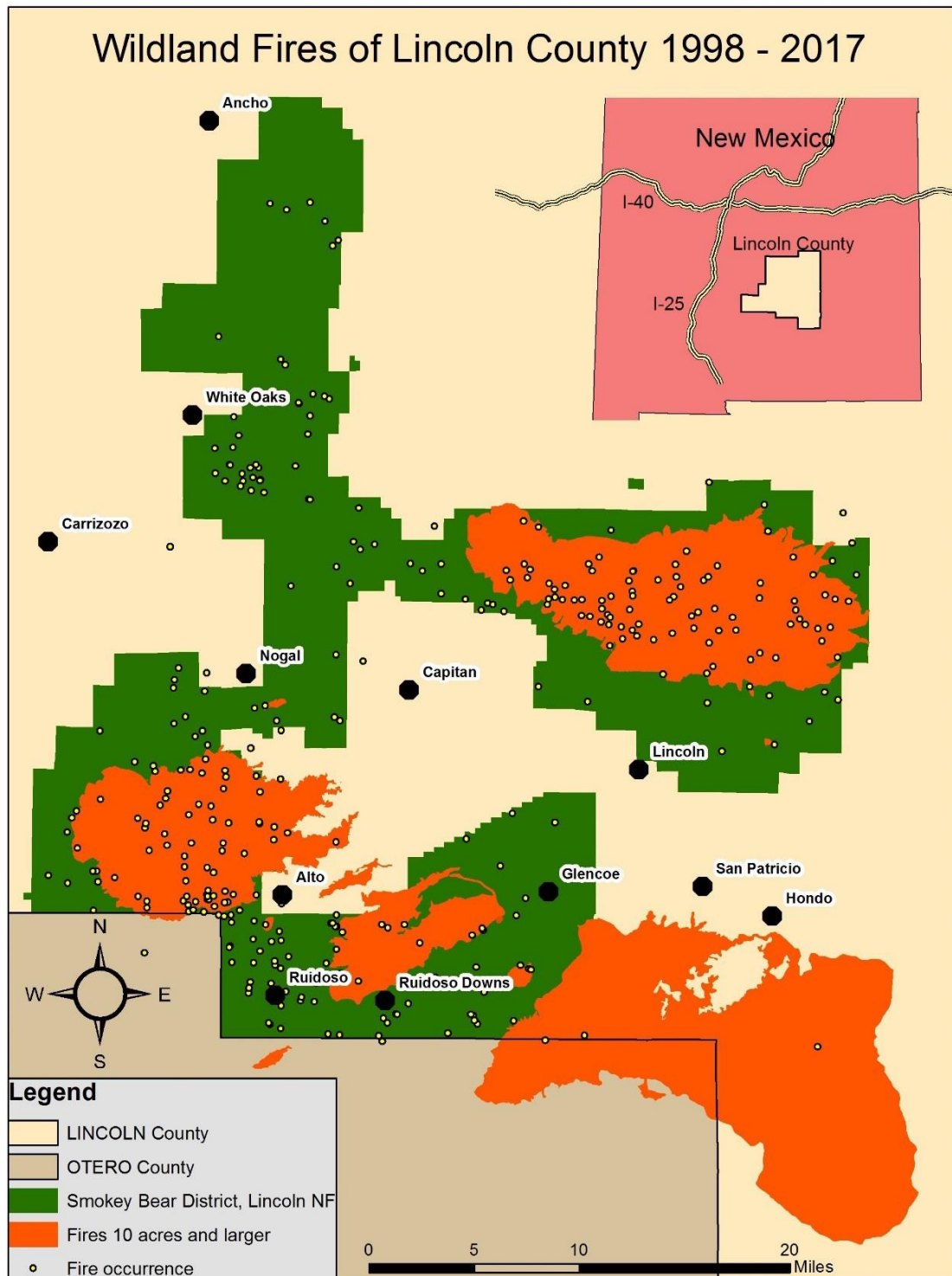


Figure 5-2 Fire History Basemap.



The majority of Lincoln County is dominated by a high desert, with grasslands, pinon juniper forests, ponderosa pine forests, and dry mixed conifer forests occurring at progressively higher elevations. Currently, forests are too dense with most stands in the County being overstocked, contributing to a high degree of departure from its historic range of variability (land fire dataset). Lincoln County's wild land urban interface (WUI) and areas of high fire risk are a mix of pinon juniper, ponderosa pine, and mixed conifer forest types. Limited amounts of riparian forests exist along waterways. Stand densities in untreated forest are higher than historical norms. As of 2014, beetle and insect damage are at epidemic proportions. This combination of insects, disease, drought, and fire caused stress are responsible for significant mortality in some stands/hillsides, and is expected to continue. This mortality increases fire risk while dead trees hold needles, and will contribute to increased fuel loading as dead trees fall to the forest floor. Treated areas (public and private land) have generally fared better than untreated land but are not immune to insects, disease, or drought. Current conditions around communities have improved largely due to thinning efforts, but much work remains to be completed.

Much of the county has been treated to reduce hazardous fuel. Strategically located public land has been treated by government agencies, and private land has been treated by landowners, often with the assistance of government grant programs. The desired conditions around structures include defensible space with a minimum cleared area extending 30 feet from the structure. Additional clearance is desirable if appropriate. A variety of fuel treatment strategies are needed to reach the desired conditions. Treatment types include mechanical removal, mastication, bulldozer pushes, piling, handwork and prescribed burns.

The stakeholders in Lincoln County have been working with one another for over 10 years. Over this time, great strides have been made in reducing the wildfire risk around the community. Ruidoso became a Firewise community in 2003, Ranches of Sonterra Subdivision & Black Forest Subdivision became a Firewise communities in 2015.<sup>1</sup> The surrounding subdivisions and communities are currently implementing similar strategies. The Sierra Blanca Wildfire Training Academy has been training local and regional firefighters and provides a variety of NWCG classes for municipal, volunteer, state and federal agency firefighters. The Greater Ruidoso Area working group provides a forum for agency representatives to plan and develop new projects. Local fire departments are implementing interagency cooperative burns. Figure 5-3 illustrates the 2014 fuels projects in Lincoln National Forest District.

Various entities in Lincoln County and in the Village of Ruidoso have conducted hazardous fuel reduction projects and have treated over 50,000 acres since 2008. Treatments have occurred on National Forest lands, BLM lands, State trust lands, Municipal lands, and private property. In June 2002, the Village of Ruidoso Council passed a mandatory fuels management ordinance to facilitate the creation of defensible space around homes, implementing the VOR Fuels Management Program, see Appendix C. Approximately 13,000 acres within the Village of Ruidoso will be treated to a ground fire standard, which is designed to keep a fire on the ground and reduce the risk of a wildfire spreading into the trees. Regarding changes in development within the last 5 years, Lincoln County has had a population decrease and has had minimal commercial and residential development, which is anticipated to continue within the next 5 years. Therefore, there has been no change to the vulnerability on the wildfire hazard.

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<sup>1</sup> <http://firewise.org/>

# Lincoln National Forest Smokey Bear Ranger District FY 2014 Fuels Projects

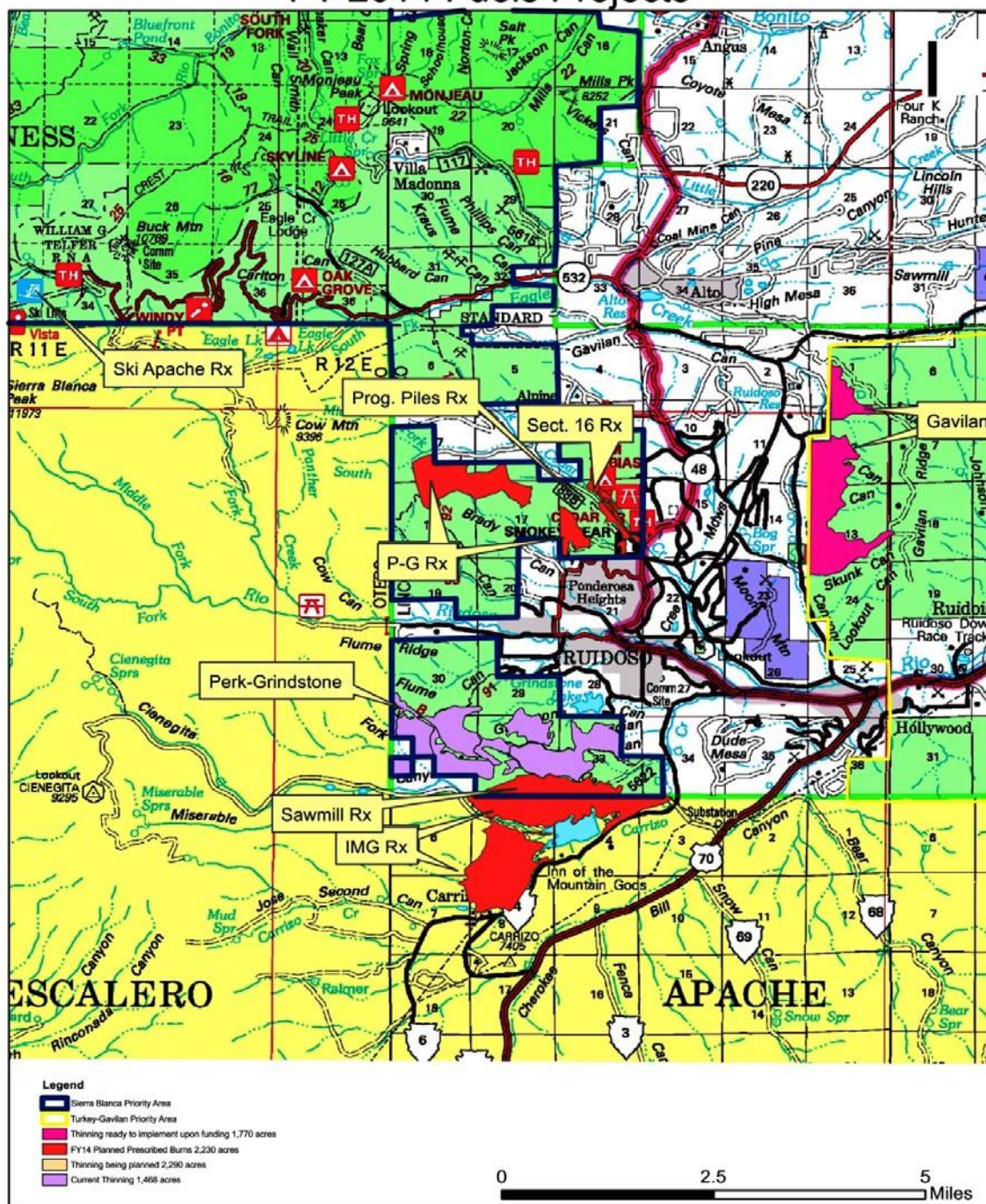


Figure 5-3 illustrates the 2014 fuels projects in Lincoln National Forest District.

### **Village of Ruidoso**

The majority of the Village of Ruidoso (VOR) is dominated by, pinon juniper forests, ponderosa pine forests, and mixed conifer forests. Commercial and residential buildings are mixed throughout the forested areas within the Village limits. Therefore, the urban areas are very congested with dense stands of trees and buildings. The wild land and urban interface (WUI) surrounding the VOR is dominated by pinon juniper, ponderosa pine, and mixed conifer forests on steep ridges and deep canyons.

Limited amounts of riparian forests exist along waterways. Beetle and insect damage are at epidemic proportions. This combination of insects, disease, drought, and fire caused stress are responsible for significant mortality in some stands/hillsides, and is expected to continue. This mortality increases fire risk while dead trees hold needles, and will contribute to increased fuel loading as dead trees fall to the forest floor. Treated areas (public and private land) have generally fared better than untreated land but are not immune to insects, disease, or drought. Current conditions around VOR have improved largely due to thinning efforts, but much work remains to be completed. Vegetation on treated properties quickly grows back underscoring the need for continued maintenance.

Ruidoso became a Firewise community in 2003 and in June 2002, the Village of Ruidoso Council passed a mandatory fuels management ordinance to facilitate the creation of defensible space around homes, implementing the VOR Fuels Management Program, see Appendix C. Approximately 13,000 acres within the Village of Ruidoso will be treated to a ground fire standard, which is designed to keep a fire on the ground and reduce the risk of a wildfire spreading into the trees. However, due to the forest density, steep terrain and the close proximity of buildings any fire that gets into the VOR will be catastrophic. Fire behavior will be unpredictable based on winds at the time will achieve a crown fire and move very fast through the Village. Per Figure 5-1, the magnitude for any wildfire in VOR is anticipated to range in the higher level of intensity, (3-5). See Appendix I for wildfire susceptibility base maps.

### **City of Ruidoso Downs**

Ruidoso Downs is dominated by pinon juniper and ponderosa pine forests. Commercial and residential buildings are mixed throughout the forested areas within the City limits. The Rio Ruidoso flows from the west city limit, VOR, to the east city limit. Some riparian forests exist along the river. Ruidoso Downs landscape is from the river valley to steep canyons and ridges on the south around Turkey canyon. The WUI on the south and east sides of the City are also dominated by pinon juniper and ponderosa forests. The Mescalero Apache reservation and USFS lands borders the City on the south. The Mescalero tribe and the USFS have completed fuels reduction projects reducing fire risk from the WUI. On 4/3/2011 the White Fire burned the WUI area to the north of the City thereby reducing wildfire risk.

Ruidoso Downs has not yet achieved Firewise status but continue to work on the certification. Due to the steep terrain on the south border of the City and the proximity of buildings to forested areas, any fire that gets into the City will cause significant damage to structures and infrastructure. Per Figure 5-1, the magnitude for wildfire in the City of Ruidoso Downs is anticipated to range in the higher level of intensity (3-5). See Appendix I for wildfire susceptibility base maps.



### **Town of Carrizozo**

Carrizozo is located on the northern end Tularosa Valley where the landscape transitions from desert to prairie grassland. Carrizozo is surrounded by the Sacramento Mountains to the east, the Oscurra Mountains and the Valley of Fires lava flow to the west, the Chihuahuan desert to the south and the central highlands to the north. The landscape directly around the Town is prairie grassland. The mountains and highlands are covered with pinon juniper, ponderosa and mixed conifer forests.

US Highways 54 and 380 intersect in Carrizozo as well as the Union Pacific railroad. Frequent wildfires are caused by the sparks from the railroad. Local firefighters are always on the lookout for fires along the railroad however, there are times when these fires become wind driven events that threaten the Town. The Valle del Sol subdivision to the east of town is a sparsely populated area where the railroad has ignited grass fires that threaten residences and drinking water wells and water storage tanks as well as other critical facilities. The town does not have adequate firefighting infrastructure fire hydrants, water capacity or adequate water lines to supply the water necessary to protect the Town from wildfire. Per Figure 5-1, the magnitude for wildfire in Carrizozo is anticipated to range from the lowest intensity to the highest intensity (1-5). See Appendix I for wildfire susceptibility base maps.

### **Village of Capitan**

The Village of Capitan is located in the Lincoln County Central Highlands in the valley floor between the Sacramento Mountains and the Capitan Mountains. The Magado Creek and the Salado creek intersect on the eastern edge of Capitan. Highways US 380, NM 48 and NM 246 also intersect in Capitan. The landscape surrounding the Village as well as throughout the subdivision is pinon juniper.

Smokey Bear, the iconic wildfire prevention bear, came from the Capitan Mountains during a wildfire in the 1950s. Wildfires occur around the area every year. The Village, USFS, Upper Hondo Soil and Water Conservation district and private landowners have completed numerous fuel reduction projects, which have lowered the possibility of a catastrophic fire within the Village limits. In the areas where pinon juniper forests are located the potential of a crown fire is prevalent however due to the previous thinning work and the density of homes a crown fire is unlikely. Per Figure 5-1, the magnitude for wildfire in Capitan is anticipated to range from the lowest intensity to the highest intensity (1-5). See Appendix I for wildfire susceptibility base maps.

Power outages occur at times during wildfire events in the area. All electrical power is carried on overhead lines therefore making them susceptible to fire. The Otero County Electric Coop is very good at keeping debris, brush and trees away from their power lines.

### **Village of Corona**

The Village of Corona is located in the Lincoln County Central Highlands on the northern county border. US Highway 54, NM 42 and NM 247 intersect in Corona. The landscape within Corona is rolling hills covered with pinon juniper forest. The WUI surrounding the Village is also rolling hills covered with pinon juniper. Ranches surround Corona and most ranchers have spent time

to reduce fuels and therefore reducing the possibility of a catastrophic wildfire. However the western border of the Village needs additional thinning to reduce wildfire potential. Wildfire behavior potentially could achieve the crowns however due to the previous fuel reduction work, fire will most likely stay on the ground. Per Figure 5-1, the magnitude for wildfire in Corona is anticipated to range from the lowest intensity to high intensity (1-4). See Appendix I for wildfire susceptibility base maps.

Power outages occur at times during wildfire events in the area. All electrical power is carried on overhead lines therefore making them susceptible to fire. The Central New Mexico Electric Coop is very good at keeping debris, brush and trees away from their power lines. The Village is small and has very limited resources as far as money and employees. Adequate fire hydrants are lacking in order to protect the Village and its residents from a wildfire.

### **Historical Occurrences**

Table 5-7 below describes the wildfires, per jurisdiction, that occurred between 1/1/2010-1/1/2016, according to the National Climate Data Center (NCDC).

**Table 5-7 1/1/2010-1/1/2016 Wildfires - Historic Occurrences per Jurisdiction**

Wildfires	Date	Detailed Description
Lincoln County	8/7/2011 Baton Rouge Fire	Though it was the middle of monsoon, dry fuels and abundant lightning resulted in a new wildfire. The Baton Rouge Complex consumed over 28,000 acres, most of which was within Lincoln County, though some burnout operations occurred just across the border in Chaves County. The Baton Rouge Complex consisted of both the Baton Rouge wildfire and the Flying H wildfire which were started by lightning. In all, the fires burned 28,165 acres near the Chaves and Lincoln county line. Approximately 10 power poles, which fed a local ranch, were destroyed on the north side of the fire within Lincoln County. Total property damage was \$25K.

**Table 5-7 1/1/2010-1/1/2016 Wildfires - Historic Occurrences per Jurisdiction**

Wildfires	Date	Detailed Description
Lincoln County	6/28/2011 Donaldson Fire	A wildfire which started on June 28, 2011, named the Donaldson because it started on the ranch of famous newsman Sam Donaldson, was caused by lightning. The high winds caused the fire to pick up intensity as it sped south of Hondo reaching both sides of the Rio Hondo, reaching not only private land but the Mescalero Apache Tribal lands as well. The fire burned approximately over 100,000 acres and caused over \$5 million in damages.
Lincoln County	4/3/2012 Little Bear Fire	This lightning sparked wildfire erupted on the afternoon of June 4, 2012 then spread rapidly overnight during strong gusty winds. The Little Bear Fire burned approximately 35,300 acres of National Forest System (NFS) Lands on the Smokey Bear Ranger District of the Lincoln National Forest, with total burn area of 44,330 acres. The fire started in the White Mountain Wilderness and ran northeast across six watersheds, including the Rio Bonito, in the mountains directly adjacent to Ruidoso, Alto, and Angus, New Mexico. The burn severity was high to moderate throughout 53% of the fire. The fire destroyed 254 residential structures, 12 outbuildings, and forced numerous evacuations across the region. \$26M in property damage was reported.
Lincoln County	2/9/2015	Persistent high pressure over New Mexico caused a prolonged period of near record to record high temperatures for central and eastern areas. Very warm temperatures on the 9th combined with low humidity values and windy conditions to create critical fire weather conditions for portions of east central New Mexico. A grass fire started around 145pm 60 miles west of Roswell, or near Hondo. Forestry officials were able to contain the 10 acre fire about an hour later, but not before an outbuilding was destroyed. No other injuries or property damages were reported. Total property damage was \$6K.

**Table 5-7 1/1/2010-1/1/2016 Wildfires - Historic Occurrences per Jurisdiction**

Wildfires	Date	Detailed Description
Village of Ruidoso	4/3/2011 The White Fire	A human-caused wildfire begun in Gavilan Canyon and quickly spread north and northeast as very strong winds fueled the fire. The White Fire crossed Highway 70 near Ruidoso Downs and continued to move toward Forest Service Road 120. Highway 70 between mile markers 265 and 271 was closed for a time. Much of the burned area consists of steep, rough and rocky terrain, which made it difficult to contain the fire. In all, 10,384 acres were scorched, 5 homes and 7 outbuildings were destroyed and another 2 homes and 2 outbuildings were damaged, totaling \$1.5 Million in property damage costs.
Village of Ruidoso	6/16/2011 The Swallow Fire	The Swallow Fire quickly engulfed 9 homes amidst breezy, hot and very dry conditions. This human caused fire, named the Swallow Fire for starting on Swallow Drive, burned 10 acres of land in a wooded Ruidoso neighborhood. Nine homes were lost to the blaze, totaling \$3.50 Million in property damage costs.
Ruidoso Downs	N/A	From 2010-2016, there have been no wildfires in the City of Ruidoso Downs.
Carrizozo	N/A	From 2010-2016, there have been no significant wildfires in the Town of Carrizozo.
Capitan	N/A	From 2010-2016, there have been no significant wildfires reported in the Village of Capitan.
Corona	N/A	From 2010-2016, there have been no significant wildfires reported in the Village of Corona.



Source: Photo of Village of Ruidoso Fire Department retrieved from [http://www.whitesandsconstruction.com/project/ruidoso\\_main\\_fire\\_station/](http://www.whitesandsconstruction.com/project/ruidoso_main_fire_station/)



Source: wildfiretoday.com, photo of the 2012 Little Bear Fire





Source: earthobservatory.nasa.gov, aerial photo of the 2012 Little Bear Fire

### **Probability of Occurrence**

When calculating Wildfire probability, the MPT agreed to use the Priority Risk Index (PRI), explained further in Table 5-28. Probability in Table 5-8 below is calculated from the following criteria:

- Unlikely – Less than 1% annual probability
- Possible – Between 1 and 10% annual probability
- Likely – Between 10 and 100% annual probability
- Highly Likely – 100% annual probability

**Table 5-8: Wildfire Probability of Occurrence**

Wildfire Probability of Occurrence per Jurisdiction							
JURISDICTION	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
LINCOLN COUNTY	WILDFIRE	LIKELY	CATASTROPHIC	MODERATE	< 6 HRS	> WEEK	3.5
RUIDOSO	WILDFIRE	HIGHLY LIKELY	CATASTROPHIC	MODERATE	< 6 HRS	< WEEK	3.7
RUIDOSO DOWNS	WILDFIRE	LIKELY	LIMITED	MODERATE	< 6 HRS	< WEEK	2.8
CARRIZOZO	WILDFIRE	UNLIKELY	LIMITED	NEGLIGIBLE	6 - 12 HRS	< 24 HRS	1.6
CAPITIAN	WILDFIRE	LIKELY	LIMITED	SMALL	< 6 HRS	< 24 HRS	2.5
CORONA	WILDFIRE	LIKELY	LIMITED	MODERATE	< 6 HRS	> WEEK	2.9

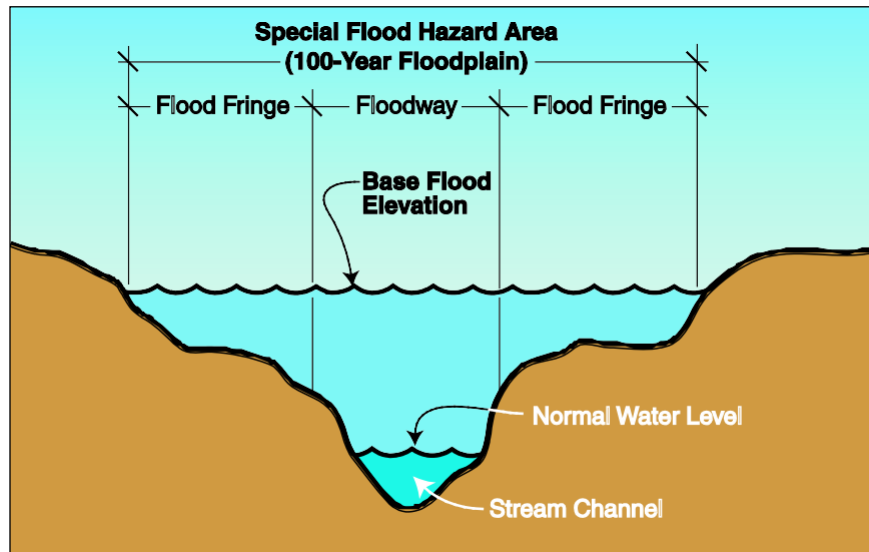
### **Climate Change Impacts**

The National Climate Change Assessment (NCA) report (Garfin, et.al., 2014) projects wildfire risk and incidents in the Southwest region will likely be increased due to climate change. This is stated as one of the “Key Messages” due to increased temperatures, reduced precipitation, and more severe periods of drought. This assessment will require additional efforts focused towards vegetation management and consideration for jurisdictions to implement climate change impacts into their CWPP.

#### **5.2.2 Flood**

##### **Description**

Floods can amount to be some of the most frequently occurring, costly disasters experienced. Floods can be caused by any number of differing weather events and can cause, property damage including structural and landscape, injuries, and loss of life. Flooding occurs when a river, stream, lake, or other body of water overflows its banks onto normally dry land or there is an excessive pooling of surface water. These events can develop slowly or happen very quickly. These overflow areas are floodplains, Figure 5-4.



**Figure 5-4 Flood Definition**

Riverine floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. Flood studies use historical records to determine the probability of occurrence for different extents of flooding. The flood recurrence intervals, shown in Table 5-9, are expressed as the percentage chance that a flood of a specific extent will occur in any given year. Alluvial fans and alluvial fan flood hazards do exist in the state. Alluvial fan flood hazard characteristics include heavy sediment/debris loads and high velocity flows. Flash floods are usually the result of excessive precipitation or rapid snowmelt and can occur suddenly. Flash floods cannot be predicted.

**Table 5-9: Flood Recurrence Intervals**

Flood Recurrence	Chance of Occurrence in Any Given Year
10 year	10%
50 year	2%
100 year	1%
500 year	0.20%

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. The Mitigation Division, a component of the Federal Emergency Management Agency (FEMA), manages the NFIP and oversees the floodplain management and mapping components of the program.

Nearly 20,000 communities across the United States and its territories participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities.

The NFIP Community Rating System (CRS) was implemented in 1990 as a program to recognize and encourage community floodplain management activities to go beyond minimum NFIP standards. The National Flood Insurance Reform Act of 1994 codified the CRS in the NFIP. Under the CRS, flood insurance premium rates are adjusted to reflect the reduced flood risk resulting from community activities that meet the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance.

Flood damage is reduced by nearly \$1 billion a year through partnerships with NFIP and CRS communities, the insurance industry, and the lending industry. Buildings constructed in compliance with NFIP building standards also suffer approximately 80% less damage annually than those not built in compliance. Further, every \$3 paid in flood insurance claims saves \$1 in disaster assistance payments.

The NFIP is self-supporting for the average historical loss-year, which means that operating expenses and flood insurance claims are not paid for by the taxpayer but through premiums collected for flood insurance policies. The program has borrowing authority from the U.S. Treasury for times when losses are heavy; however, these loans are usually paid back with interest.

To obtain secured financing to buy, build, or improve structures in Special Flood Hazard Areas (SFHAs), flood insurance must be purchased. Lending institutions that are federally regulated or federally insured must determine if the structure is located in a SFHA and must provide written notice requiring flood insurance.

Flood insurance is available to any property owner located in a community participating in the NFIP. Any area is susceptible to flooding, although to varying degrees. In fact, 25% of all flood claims occur in low-to-moderate risk areas.

The most widely adopted design and regulatory standard for floods in the United States is the 1% annual chance flood and this is the standard formally adopted by FEMA. The 1% annual flood, also known as the base flood elevation, has a 1% chance of occurring in any particular year. It is also often referred to as the “100-year flood” since its probability of occurrence suggests it should only occur once every 100 years. Experiencing a 100-year flood does not mean a similar flood cannot happen for the next 99 years; rather, it reflects the probability that over a long period of time, a flood of that magnitude should only occur in 1% of all years.

Table 5-9 shows NFIP status and statistics for Lincoln County and participating jurisdictions. No payments have been paid out in Lincoln County for flood damage since the establishment of the NFIP in 1978.

**Table 5-10: NFIP status and statistics for Lincoln County and participating jurisdictions**

Jurisdiction	Community ID	NFIP Entry Date	Current Effective Map Date	Number of Policies	Amount of Coverage	Floodplain Management
Lincoln County	350122	6/2004	11/16/2011	89	\$20,330,400	Provides floodplain management for the Unincorporated County with a CFM
Village of Ruidoso	350098	6/7/1974	11/5/2014	211	\$40,341,100	Floodplain management provided by the Village of Ruidoso CFM
Ruidoso Downs	350034	5/31/1974	11/5/2014	6	\$1,399,500	Floodplain management provided by the City of Ruidoso Downs CFM
Carrizozo	350110	6/2/2010	11/16/2011	1	\$74,800	Floodplain management provided by MOU with Lincoln County
Capitan	350098	11/19/2008	11/16/2011	2	\$128,600	Floodplain management provided by MOU with Lincoln County
Corona	350099	N/A	11/16/2011	0	0	NOT A PARTICIPATING NFIP COMMUNITY
<b>Lincoln County, City of Ruidoso Downs, Capitan, and Carrizozo do not have repetitive loss structures. The Village of Ruidoso has one repetitive loss structure that is residential and is currently outside the mapped special flood hazard area.</b>						

FEMA Flood Insurance Rate Maps (FIRM) exist for Lincoln County (dated 3/28/78), the Village of Ruidoso (3/15/94), Ruidoso Downs (7/5/82), Carrizozo (8/22/75), and Capitan (6/25/76). These maps are included as Appendix D.

Flood zones as identified throughout this plan are defined below:

- **A Zone.** The 100-year or base floodplain elevation (BFE). These floodplains are mapped by approximate methods; BFEs are not determined. This is often called an unnumbered A zone or an approximate A zone. Because detailed analyses are not performed for such areas, no depths or base flood elevations are shown within these zones
- **AE Zone.** Base floodplain where base flood elevations are provided.
- **AH Zone.** Shallow flooding in base floodplain. BFEs are provided.
- **Zone X (shaded):** Area of moderate flood hazard, usually the area between the limits of the 100-year and the 500-year floods.
- **Zone X (unshaded):** Area determined to be outside the 500-year flood.
- **Zone D:** Area of undetermined but possible flood hazards.

## **Location and Extent per Jurisdiction**

### **Lincoln County**

Table 5-11 lists the major causes of riverine flooding vs. flash flooding. Additionally, flash flooding can affect large portions of the County. Flash flooding is the second greatest weather hazard in New Mexico. The flash flooding problem stems from a number of factors:

- Summertime monsoon rains
- Warm rain on top of snowpack
- Vegetation loss on landscape due to wildfires
- Soil deterioration due to drought

**Table 5-11: Flooding vs. Flash Floods – Causes**

<b>Riverine Floods</b>	<b>Flash Floods</b>
Low lying, relatively undisturbed topography	Hilly/mountainous areas
High season water tables	High velocity flows
Poor drainage	Short warning times
Excess paved surfaces	Steep slopes
Constrictions – filling	Narrow stream valleys
Obstructions – bridges	Parking lots and other impervious surfaces
Soil characteristics	Improper drainage

During the summer (June through August), thunderstorm frequency in certain parts of New Mexico is among the highest in the nation. Excessive moisture during the summer can lead to large volume runoffs enhanced by the terrain.

Most of the flash floods in New Mexico are associated with the summer monsoon season. Approximately 60% of all flash floods in the state occur in July and August. The monsoon season generally dissipates in the northern part of the state in early September.

In mid- to late summer the Pacific winds bring humid subtropical air into the state. Solar heating triggers afternoon thunderstorms that can be devastating. Because of too much rain, in too small an area, in too short a time, flash flooding may result. These flash floods generally travel down arroyos (normally dry streambeds) and can produce a rapid rise in water level, high velocity, and large amounts of debris, which can lead to significant damage that includes uprooting trees, undermining buildings and bridges, and scouring new channels.

The intensity of flash flooding is a function of the intensity and duration of rainfall, steepness of the watershed, stream gradients, watershed vegetation, natural and artificial flood storage areas,



and configuration of the streambed and floodplain. Dam failure and ice jams may also lead to flash flooding. Urban areas are increasingly subject to flash flooding due to the removal of vegetation, replacement of ground cover with impermeable surfaces, and construction of drainage systems. Local drainage floods may occur outside of recognized drainage channels or delineated floodplains from a combination of locally heavy precipitation, a lack of infiltration, inadequate facilities for drainage and storm water conveyance, and increased surface runoff.

Winter flash flood events usually result from unseasonably high-level rain on top of a snow pack. Excessive runoff allows the combined release of the water in the snow pack along with the rain. These can be flash flood events lasting less than a day, or they can evolve into longer-term flooding events lasting from one day to a couple of weeks. Winter flooding occurs between November and February and usually affects the southwest portion of the state.

Most spring events occur between April and June. They vary between winter type events where the rain falls over an old snow pack in or near the mountains to events in the eastern plains, which are often associated with cold fronts, abundant moisture from the Gulf of Mexico, and upslope conditions.

Figure 5-5 demonstrates that seasonal flooding and flashfloods may impact large portions of Lincoln County. Additionally, the extent of the impact from flooding is best demonstrated on the County's Flood Insurance Rate Maps which can be accessed through the Lincoln County Planning Department.

There is an expectation that Lincoln County will experience at least one flood event a year. Based on available data it is expected that areas within identified floodplains would experience one to ten feet of inundation impacting structures and the ability to navigate flooded transportation routes. In the aftermath of the 2012 Little Bear Fire, it has been noted that areas that were previously not shown in the flood plain are being more severely impacted by flood events, particularly the Rio Bonito and Eagle Creek, and will be addressed more fully in the next update. Examples of flood events and their extents include the 2008 Ruidoso Flood (discussed below) where the peak flow measured at the Hollywood Station registered 1630 cubic feet per second. In addition to the potential for annual flooding events, data is available from the County Planning Department (provided by FEMA) regarding 100-year flood events in Lincoln County for the following rivers (flood index data is feet above river bed):

- Carrizo Creek : 12' +/-
- Cedar Creek : 9' +/-
- Rio Bonito: 10' +/-
- Rio Ruidoso: 20' +/-
- Rio Hondo: 20' +/-
- Eagle Creek: 10' +/-
- Little Creek: 10' +/-
- Gavilan Creek: 10' +/-

In all areas of the County bridges/crossings are going to be under the base flood elevation according to the 1% flood chart. This will be a severe risk to the County of losing road infrastructure, and necessitating water crossing rescues of County residents that will be stranded.



The worst case scenario for flooding would result from failure of the Lake Mescalero, Bonita, Alto and Grindstone dams which would result in the water flow in the Rio Ruidoso increasing to 40 feet above the streambed through Ruidoso and Ruidoso Downs. After Ruidoso Downs it would be 20 feet above the streambed through the Hondo Valley.

Regarding changes in development within the last five years, Lincoln County has shown minimal commercial and residential development with a decrease in population, which is anticipated to continue within the next five years. Therefore, there has been no change to the vulnerability of the flooding hazard.

Inundation levels for communities of concern in Lincoln County are illustrated on the maps identified in Table 5-12. Additional data may be obtained through the Lincoln County Flood Manager. It must be noted that, due to a lack of project funding, the most current set of Flood Insurance Rate Map (FIRMs) does not include the entire County and there may be additional areas that will be impacted by flood events for which data is not available.

**Table 5-12: Lincoln County FIRMs – Community Maps and Flood Hazard Areas**

Community	Community Number	Panels	Flood Hazard Areas
Capitan, Village of	350098	1615, 1625	Special Flood Hazard Areas (Zone A) along Salado Creek , Magado Creek, Oso Creek and Spring Canyon Creek
Carrizozo, Town of	350110	1250, 1275	Special Flood Hazard Areas (Zone A) at the east end of town and along the Nogal Arroyo
Corona, Village of	350099	0090,0305	Special Flood Hazard Area (Zone A) along County Line Road
Mescalero Apache Indian Reservation	350041	2055, 2065	Maps not in data set.
Village of Ruidoso	350033	1890, 1895, 1910, 1950, 2052, 2055, 2056, 2057, 2058, 2059, 2066, 2067, 2080, 2100	Special Flood Hazard Area (Zone AE) along the Rio Ruidoso
City of Ruidoso Downs	350034	2059, 2080, 2085	Special Flood Hazard Area (Zone AE) along the Rio Ruidoso

Figure 5-6 illustrates that areas of highest potential flooding impact are water bodies located along transportation routes such as Highway 70 and nearest to population centers like Hondo, Ruidoso Downs and Ruidoso. See Appendix H for additional maps of dams, rivers, creeks, and detailed inundation areas.

Flood gauges maintained by USGS are located at the following locations:

- Rio Hondo at Diamond A Ranch near Roswell, NM
- Rio Hondo above Chavez Canyon near Hondo, NM
- Rio Ruidoso at Hollywood, NM
- Rio Ruidoso at Ruidoso, NM
- Eagle Creek below South Fork near Alto, NM
- Bonito Lake near Alto, NM
- Rio Bonito at Highway 48 Bridge near Alto, NM

According to the report New Mexico Flood History, excessive runoff of the Rio Ruidoso is the principal cause of flooding in Ruidoso. The Rio Ruidoso is a perennial river which flows approximately 6 miles through the village in an easterly direction. The source of the Rio Ruidoso is on the eastern slope of Sierra Blanca at an elevation of nearly 12,000 feet. The drainage area at the Hollywood gaging station is 125 square miles.

Excessive flow in the tributaries of the Rio Ruidoso causes the remaining flood problems in the community. The major tributaries to the Rio Ruidoso from upstream to downstream are: Brady Canyon, an intermittent stream which flows southeasterly; Carrizo Creek, a perennial stream which rises on the southeast slope of Sierra Blanca, then flows to the northeast; Cedar Creek, a perennial stream which flows southeasterly; and Cherokee Bill Canyon, which contains a northeasterly flowing intermittent stream. Cherokee Bill Canyon flow originates in the Sacramento Mountains.

In Lincoln County, the anticipated magnitude of water levels above the streambed are shown on the following:

- Rio Bonito - 10' above the streambed

Water in the Rio Bonito canyon would reach 10' above the streambed and potentially cause severe damage to property and impact 27 homes, the lower portion of the Nazarene Church camp and an RV park, as well as street flooding and low water crossings. The MPT agreed that 25% of those structures would be severely damaged or destroyed.

- Rio Hondo - 20' above the streambed

Water in the Rio Hondo, below the confluence of the Rio Ruidoso and Rio Bonito would reach 20' above the streambed. This area is very rural with most of the impact being farm land, street flooding, low water crossings, and acequias. Approximately 6 homes are situated below 20' of the streambed. The MPT agreed that 25% of these homes would be severely damaged or destroyed.

- Salado creek - 10' above the streambed

Salado creek runs through all rural areas and would not have any impact on farm land, low water crossings, and acequias or structures.

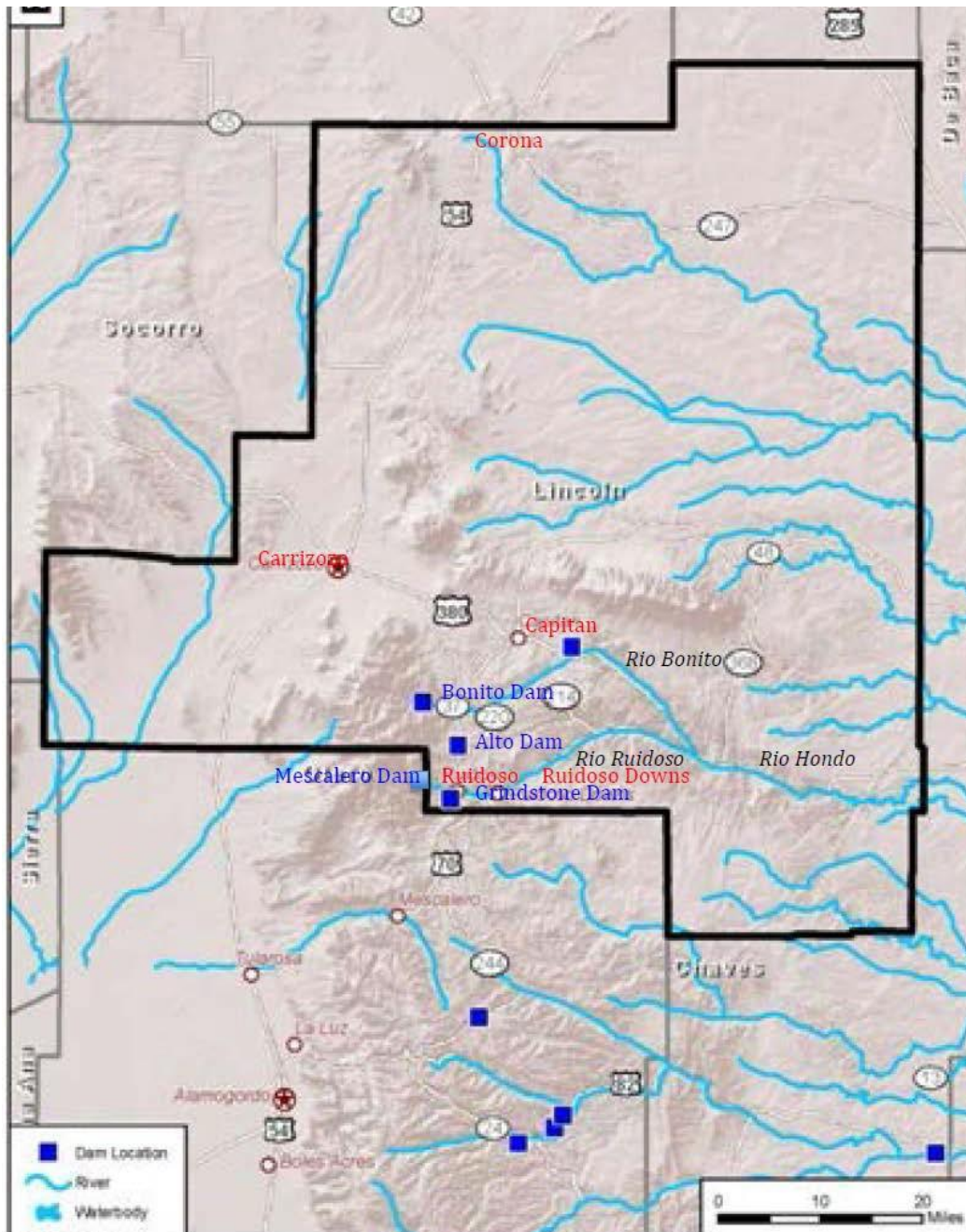


Figure 5-5 Lincoln County Flood Plain

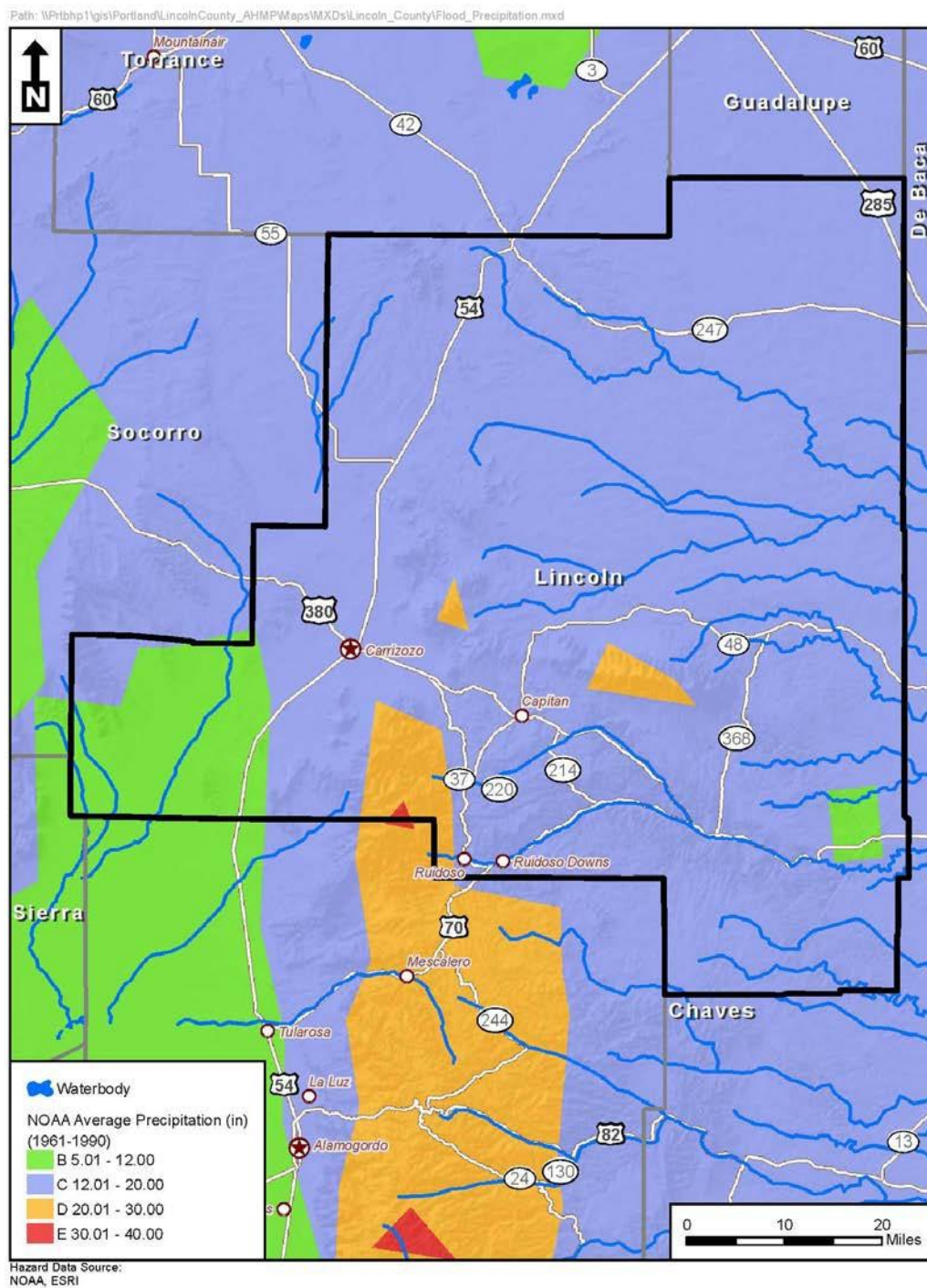


Figure 5-6 Potential Flood Impact Areas and Precipitation



### **Village of Ruidoso**

As mentioned above under Lincoln County, the Village of Ruidoso has the potential to be severely impacted by a flood event, whether a flash flood or a flood caused by dam failure. For those who live or own property right on the Rio Ruidoso River or Bonito River, a flood is a devastating situation.

The severity of a flood impact to the Village of Ruidoso was shown by the 2008 Flood when hurricane Dolly brought tropical moisture into New Mexico, dumping up to seven inches of rain around the village. This caused the Rio Ruidoso and Rio Bonito to rise well above flood stage and resulted in widespread and serious flooding around Ruidoso. The 2008 Flood damaged over 350 homes, destroyed 13 bridges, stranded residents and visitors, and caused 1 fatality. The total destruction totaled \$25 million. See Appendix H for detailed inundation maps.

According to the FEMA 100-year flood data, the following creeks and rivers in the Village of Ruidoso would reach the magnitude on the following flood index below:

- Carrizo Creek - 12' above the streambed,
- Cedar Creek - 10' above the streambed, and
- Rio Ruidoso - 20' above the streambed.

With water over 12' above the streambed, Carrizo canyon would sustain severe damage with 102 homes and businesses destroyed or have major damage; Cedar Creek would have water over 10' above the streambed, causing street flooding and affecting low water crossings. Cedar Creek canyon is narrow and steep with many homes and the USDA Forest Service (USFS) office in harms way. Approximately 25 homes would be inundated with floodwaters at some level. At least 14 of those homes would be significantly damaged or destroyed. The USFS office should have enough elevation to keep from having any floodwater reach the building during a 100-year flood event.

Water will be over 20' above the streambed in the Rio Ruidoso. Rio Ruidoso canyon is the most populated area of all the waterways in the Village limits. Over 120 homes and businesses including 7 public bridges would be in harms way through the Rio Ruidoso Canyon. The MPT agreed that 25% of those buildings would be severely damaged or destroyed.

### **City of Ruidoso Downs**

The potential for flooding can change and increase through various land use changes and changes to land surface. A change in environment can create localized flooding problems in and outside of natural floodplains by altering or confining watersheds or natural drainage channels. A flood impact to the City of Ruidoso Downs parallels the severity of a flood impact to the Village of Ruidoso.

The 2008 Flood impacted the City of Ruidoso Downs too. Homes were destroyed, the Downs Racetrack flooded, and roads closed causing transportation disruptions. Many residents had to be evacuated, and businesses and agricultural land in the area were also damaged, causing millions in property damage.

According to the FEMA 100-year flood data, the following river in the City of Ruidoso could potentially reach the magnitude on the following, see flood index below:

- Rio Ruidoso – 10’ -20’ above the streambed.

Approximately 89 homes street flooding, low water crossings, and the Ruidoso Downs Racetrack would be inundated with floodwaters. According to the MPT 25% of those structures would be severely damaged or destroyed. See Appendix H for detailed inundation maps.

### **Historical Occurrences**

Information from the NCDC indicated that 25 flood events were reported in Lincoln County between January 2010 and January 2016. The total property damages associated with these events were estimated at \$294,000, 0 deaths and 1 injury. Of these 25 occurrences, 1 was a flood event, and the remaining 24 events were flash floods. Table 5-13 shows detailed Flood historic occurrences per jurisdiction. For the Town of Carrizozo, Village of Capitan, and Village of Corona, there has not been any previous occurrence of flood; therefore, flood is not profiled as a hazard.

**Table 5-13: 1/1/2010-1/1/2016 Flood - Historic Occurrences per Jurisdiction**

<b>Flood</b>	<b>Date</b>	<b>Detailed Description</b>
Lincoln County	7/28/2010	Deep monsoon moisture combined with an easterly wave over southeast New Mexico to create widespread heavy rain across northern and central New Mexico. Hardest hit areas were in the vicinity of the central mountain chain, where several flash floods were observed. \$26K in property damage was reported.
Lincoln County	8/12/2011	A strong thunderstorm with very heavy rain moved squarely over the White Fire burn scar dumping up to 2 inches per radar estimates. A few hours later, a seemingly typical afternoon thunderstorm north of Clovis produced violent wind gusts as the storm quickly collapsed. \$10K in property damage was reported.

**Table 5-13: 1/1/2010-1/1/2016 Flood - Historic Occurrences per Jurisdiction**

Flood	Date	Detailed Description
Lincoln County	6/22/2012	Slow moving showers and thunderstorms developed early in the afternoon over the Little Bear burn scar. Heavy and prolonged rain was received over portions of a recent wildfire burn scar leading to flash flooding. Three hundred yards of forest service road 107 washed out between Runnels Stables on northwest end of Little Bear burn scar and Bonito Lake. \$50K in property damage was reported.
Lincoln County	7/5/2012	This pattern maintained a persistent south to north steering component within a deep monsoonal moisture plume over the state. Precipitable water values were 150-200% of normal. Narrow stream channels quickly rose with water levels reaching a depth of 4 feet. the flood waters moved debris and boulders the size of car tires 10 to 15 feet downstream. \$10K in property damage was reported.
Lincoln County	7/7/2012	Monsoonal moisture plume over much of western and central portions of the state led to continued development of isolated to scattered showers and thunderstorms across much of the area. Development of storms to the north of the Little Bear Fire burn scar led to flooding in portions of the scarred area. A partial road collapse occurred along Old Bonito Lake Rd due to flash flood undercuts and encroachments. \$25K in property damage was reported.
Lincoln County	9/6/2012	A weak back door cold front pushed into the state ushering in lower level moisture and creating a favorable environment for afternoon shower and thunderstorm development. Large rocks and boulders were washed over portions of Forest Road 107 making it impassable. Rainfall amounts of nearly one inch were reported near the area where the flash flooding took place. \$2K in property damage was reported.



**Table 5-13: 1/1/2010-1/1/2016 Flood - Historic Occurrences per Jurisdiction**

Flood	Date	Detailed Description
Lincoln County	8/1/2013	A persistent area of training thunderstorms over south-central Lincoln County produced heavy rainfall over the Little Bear burn scar. The first round of heavy rainfall dumped around 1 inch of rainfall in the area from the White burn scar west across Ruidoso to the Little Bear burn scar. \$1K in property damage was reported.
Lincoln County	9/13/2013	Heavy rainfall over the Rio Bonito watershed led to a 23 feet rise in Bonito Lake. The lake rose from 22 feet below the spillway to 8 inches over the spillway. Emergency operations were in place due to significant concerns regarding a breach of the spillway. No breach occurred. Eagle Creek was out of banks and flooded a nearby playground along NM 48. There was no property damage.
Lincoln County	7/14/2014	A couple severe thunderstorms erupted over the area given the presence of strong vertical wind shear. The most severe flooding occurred well after sunset when training thunderstorms around the Espanola area produced prolific rainfall amounts. \$0 in property damage.
Lincoln County	9/4/2014	A monsoon moisture surge containing the remnants of two tropical systems moved into the state from the south and southwest. Mud and debris was reported on State Road 107 west of Bonito Lake. \$0 in property damage.
Lincoln County	9/24/2014	A strong back door cold front shifted southwest over eastern New Mexico on the 24th, setting the stage for severe thunderstorms and more heavy rainfall. Large rocks that disrupted traffic were swept onto US 380 due to intense runoff.\$0 in property damage.

**Table 5-13: 1/1/2010-1/1/2016 Flood - Historic Occurrences per Jurisdiction**

Flood	Date	Detailed Description
Lincoln County	7/12/2015	One storm in particular to the west of Ruidoso near Bonito Lake produced a significant localized flash flood near Orchard Campground and Marthas Canyon. Several points on the road were washed over with flood waters, mud, rocks, and debris. A significant wash out with debris near Orchard Campground west of Bonito Lake. A couple places along highway 107 were impassable due to flowing water and debris. Marthas Canyon was the hardest hit. \$10K in property damage was reported.
Lincoln County	9/9/2015	Several storms quickly became strong then eventually severe with large hail and high winds. This activity merged into a large cluster of slow-moving storms around Lincoln County later in the afternoon where localized flash flooding impacted state road 462. \$0 in property damage was reported.
Village of Ruidoso	7/28/2010	Deep monsoon moisture combined with an easterly wave over southeast New Mexico to create widespread heavy rain across northern and central New Mexico. Hardest hit areas were in the vicinity of the central mountain chain, where several flash floods were observed. \$25K in property damage was reported.
Village of Ruidoso	8/21/2012	Upper level high pressure was centered over New Mexico resulting in very light and erratic steering winds aloft. This coupled with sufficient moisture aided in the development of slow-moving heavy rain producing thunderstorms over and near the central mountain chain and western high terrain. Flash flooding was observed over the Little Bear burn scar. A swift water rescue was conducted near Gavilan Canyon. \$0 in property damage was reported.

**Table 5-13: 1/1/2010-1/1/2016 Flood - Historic Occurrences per Jurisdiction**

Flood	Date	Detailed Description
Ruidoso Downs	7/13/2011	Heavy rains led to flooding in Allison Canyon along U.S. Highway 70 near mile marker 268. Fortunately, residents in the River Ranch RV park along the canyon were evacuated prior to the high water reaching the ranch. An estimated 4 to 6 feet of water flowed through the area. Fortunately, the RV park did not sustain much damage. \$0 in property damage was reported.
Ruidoso Downs	8/3/11	Heavy rain fell early in the afternoon across the White Fire burn scar. Fortunately only minor flooding ensued at the time. However, as another round of showers and thunderstorms moved over the burn scar in the evening, more significant flooding resulted. Culverts that were built along a road near Seeping Springs that crossed Allison Canyon were already at capacity from the earlier rains. The additional precipitation caused them to give way, which lead to rapid flows along Allison Canyon. These waters reach the River Ranch RV Park along Highway 70. The water was estimated to be three feet high, which topped the concrete barriers that were installed to protect the park. Fortunately, the park did not sustain any damage. \$10K in property damage was reported.
Ruidoso Downs	8/5/2011.	A thunderstorm slowing moving to the northeast, dropped significant amounts of rain between Ruidoso and Glencoe. Though the Rio Ruidoso was running high and fast downstream of Ruidoso Downs, the most significant flooding was within the town itself. Water approximately two feet deep flooded the intersection of Highlands and Joe Welch. An SUV attempted to cross the waters but was unsuccessful. Flooding and debris from the White Fire burn scar was also noted along Highway 70. \$0 in property damage was reported.

**Table 5-13: 1/1/2010-1/1/2016 Flood - Historic Occurrences per Jurisdiction**

Flood	Date	Detailed Description
Ruidoso Downs	8/20/2011	Heavy rains on the eastern half of the White Fire burn scar led to flash flooding along the Rio Ruidoso downstream toward Glencoe and Hondo. Radar estimates near 3 inches of rain fell in this area. Emergency management reported the Rio Ruidoso out of its banks for a 6 to 10 mile stretch downstream of the White Fire burn scar. High water levels in the canyons and arroyos on the east and south side of the burn scar flowed into the Rio Ruidoso, causing it to flood. Debris from the burn area was piled up on the banks. Near mile marker 272.5 on Highway 70, portions of the Rio de Oso Trailer park was underwater. \$0 in property damage was reported.
Ruidoso Downs	8/21/2011	Upper level high pressure was centered over New Mexico resulting in very light and erratic steering winds aloft. This coupled with sufficient moisture aided in the development of slow-moving heavy rain producing thunderstorms over and near the central mountain chain and western high terrain. Flash flooding was observed over the Little Bear burn scar. The Rio Ruidoso was reported to be out of its banks along U.S. Highway 70 at Fox Cave. \$0 in property damage was reported.
Lincoln County	N/A	From Jan 2010-Jan 2016, there have been no reported Flash Flooding events with a significant impact to the Village of Carrizozo.

**Table 5-13: 1/1/2010-1/1/2016 Flood - Historic Occurrences per Jurisdiction**

Flood	Date	Detailed Description
Lincoln County	9/21/2014	Many areas from the upper Gila region of Catron County eastward across Socorro and Lincoln counties into the eastern plains reported 4 day rainfall amounts of 2 to nearly 5 inches. This prolonged heavy rainfall event and abundant remnant moisture set the stage for flash flooding as a second upper disturbance approached from northwestern Mexico on the 21st. A large area of heavy rainfall shifted very slowly north across Lincoln and Chaves counties resulting in flash flooding. Flooding was reported on State Road 246 at mile markers 4,27-29, and 55-56. Pavement was damaged at mile marker 29. The highway was closed from Capitan to Roswell. \$130K in property damage was reported.
Lincoln County	9/18/2013	A weak upper level jet axis focused directly over central New Mexico interacted with abundant low level moisture entrenched over the region to produce scattered strong to severe thunderstorms. These storms were slow-moving and in many cases trained over the same areas repeatedly through the afternoon and early evening hours. Heavy rainfall with this convective activity fell on already saturated soil conditions and exacerbated flooding concerns after a historic week of flooding. NM 247 closed between mile markers 0 and 48 due to flooding. \$0 in property damage was reported.
Lincoln County	8/10/2015	The largest hail reported was quarter size near Logan, an area that also received 5.05 inches of rain throughout the event. The heavy rains produced flash flooding along U.S. Highway 54 between Corona and Carrizozo, causing the road to be closed for 45 minutes. \$10K in property damage was reported.

### **Probability of Occurrence**

When calculating Flood probability, the MPT agreed to use the Priority Risk Index (PRI), explained further in Table 5-28. Probability in Table 5-14 below is calculated from the following criteria:

- Unlikely – Less than 1% annual probability
- Possible – Between 1 and 10% annual probability
- Likely – Between 10 and 100% annual probability
- Highly Likely – 100% annual probability

**Table 5-14: Flood Hazard Probability of Occurrence**

Flood Probability of Occurrence per Jurisdiction							
JURISDICTION	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
LINCOLN COUNTY	FLOOD	LIKELY	CATASTROPHIC	MODERATE	< 6 HRS	> WEEK	3.5
RUIDOSO	FLOOD	HIGHLY LIKELY	CATASTROPHIC	MODERATE	< 6 HRS	< WEEK	3.7
RUIDOSO DOWNS	FLOOD	LIKELY	LIMITED	MODERATE	< 6 HRS	< WEEK	2.8
CARRIZOZO	NOT A SELECTED HAZARD FOR CARRIZOZO						
CAPITIAN	NOT A SELECTED HAZARD FOR CAPITAN						
CORONA	NOT A SELECTED HAZARD FOR CORONA						

### **Climate Change Impacts**

Additional policies pertaining to flood mitigation and floodplain development may be warranted due to the possible climate change effects. The NCA report (Garfin, et.al., 2014) indicates the Southwest region could have a reduction in average annual precipitation and lower streamflow volumes. Although, anticipated intensified winter storms could lead to increased flooding, also due to the impact of reduced vegetation, watershed, drought, and wildfires.

5.2.3 *Severe Weather*

5.2.3.1 *Thunderstorms*

**Description**

Thunderstorms are produced when warm moist air is overrun by dry cool air. As the warm air rises, thunderheads form and cause strong winds, lightning, hail, and heavy rains. Atmospheric instability can be caused by surface heating or by upper tropospheric (>50,000 feet) divergence. Rising air parcels can also result from airflows over mountainous areas. Generally, upper tropospheric “air mass” thunderstorms form on warm-season afternoons and are not severe. The latter “dynamically driven” thunderstorms, which generally form in association with a cold front or other regional atmospheric disturbance, can become severe, thereby producing strong winds, frequent lightning, hail, downburst winds, heavy rain, and occasional tornadoes.

Thunderstorms may have different characteristics in different regions of the state. Across the eastern plains, thunderstorms tend to be more organized, long-lived, and occasionally severe, producing large hail, lightning, and tornadoes. Thunderstorms in the western part of the state tend to be less severe on average, occasionally producing life-threatening flash floods and small hail accumulations.

The National Weather Service (NWS) definition of a severe thunderstorm is a thunderstorm that produces any of the following: downbursts, lightning, hail 0.75 of an inch in diameter or more, or a tornado. Typical thunderstorms can be 3 miles wide at the base, rise to 40,000 to 60,000 feet into the troposphere, and contain half a million tons of condensed water. Severe thunderstorms are reported each year in nearly all New Mexico counties.

Thunderstorm frequency is measured in terms of incidence of thunderstorm days or days on which thunderstorms are observed. The NCDC reports 29 thunderstorm events since July 1989 causing no deaths, 2 injuries, \$615,000 in property damage.

Lightning is defined as a sudden and violent discharge of electricity, usually from within a thunderstorm, due to a difference in electrical charges. Lightning is a flow of electrical current from cloud to cloud or cloud to ground. Nationwide, lightning causes extensive damage to buildings and structures kills or injures people and livestock, starts forest and wildfires, and disrupts electromagnetic transmissions. Lightning is extremely dangerous during dry lightning storms because people often remain outside rather than taking shelter. To the general public, lightning is often perceived as a minor hazard. However, lightning-caused damage, injuries, and deaths establish lightning as a significant hazard associated with any thunderstorm.

Damage from lightning occurs four ways:

1. Electrocution or severe shock of humans and animals;
2. Vaporization of materials along the path of the lightning strike;
3. Fire caused by the high temperatures (10,000 to 60,000°F); and

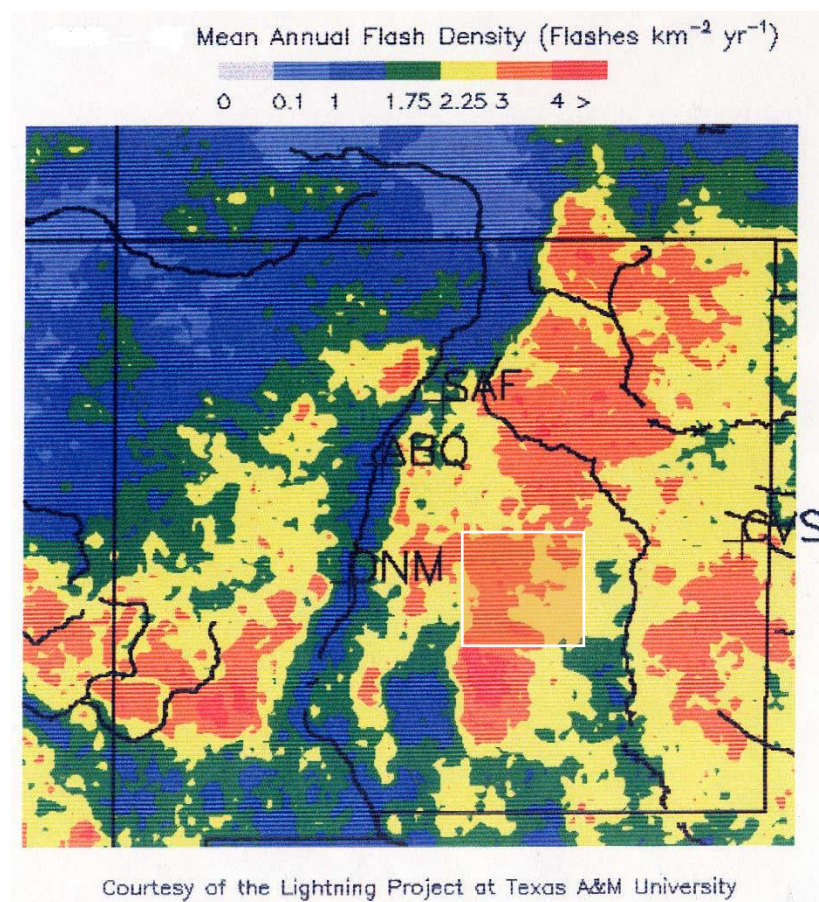


4. A sudden power surge that can damage electrical or electronic equipment.

Large outdoor gatherings (sporting events, concerts, campgrounds, etc.) are particularly vulnerable to lightning strikes. New Mexico ranks sixth in the nation in lightning fatalities with 0.55 deaths per million people annually.

The NCDC reports three lightning events between the years of 2010 and 2015, which caused 11 injuries: 8 in Alto and 3 in Capitan. Although only three events were recorded with the NCDC, it is assumed that more lightning events occur each year in Lincoln County.

While the entire state is at risk for lightning events, some areas of the state have higher concentrations of these events. Figure 5-7 shows areas of lightning density in the state, and the white outlined box represents the general vicinity of Lincoln County. According to the figure, Lincoln County lies within an area that has mean annual flash density levels of over  $3 \text{ km}^{-2} \text{ yr}^{-1}$ .



**Figure 5-7 Lightning Density**

The frequency and character of cloud-to-ground lightning can be categorized on a scale of 1 to 6 (Table 5-15). Lincoln County consistently experiences storms rating 5 or higher, and it is unlikely that this trend will change.

**Table 5-15 Lightning Activity Level**

Category of Severity	Cloud and Storm Development	Counts of cloud-to-ground strikes every 5 minutes	Counts of cloud-to-ground strikes every 15 min	Average cloud-to-ground strikes per minute
1	No thunderstorms	-	-	-
2	Cumulus clouds are common but only a few reach the towering stage. A single thunderstorm must be confirmed in the rating area. The clouds mostly produce virga but light rain will occasionally reach ground. Lightning is very infrequent.	1-5	1-8	<1
3	Cumulus clouds are common. Swelling and towering cumulus cover less than two-tenths of the sky. Thunderstorms are few, but two to three storms occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	6-10	9-15	1-2
4	Swelling cumulus and towering cumulus cover two-tenths to three-tenths of the sky. Thunderstorms are scattered but more than three must occur within the observation area. Moderate rain is commonly produced, and lightning is frequent.	11-15	16-25	2-3
5	Towering cumulus and thunderstorms are numerous, covering more than three-tenths of the sky and occasionally obscuring the sky. Rain is moderate to heavy, and lightning is frequent and intense.	>15	>25	>3
6	Dry lightning outbreak. (LAL of 3 or greater with majority of storms producing little or no rainfall.)	-	-	-

Source: <http://www.crh.noaa.gov/gid/?n=fwfintro>

Hail is frozen water droplets formed inside a thunderstorm cloud during the strong updrafts of warm air and downdrafts of cold air, when the water droplets are carried well above the freezing level to temperatures below 32°F; the frozen droplet begins to fall, carried by cold downdrafts, and may begin to thaw as it moves into warmer air toward the bottom of the thunderstorm. This movement up and down inside the cloud through cold then warmer temperatures causes the droplet to add layers of ice, sometimes becoming quite large, sometimes round or oval shaped and sometimes irregularly shaped, before it finally falls to the ground as hail.

Hail usually occurs during severe thunderstorms, which also produce frequent lightning, flash flooding, and strong winds, with the potential of tornadoes. The hail size ranges from smaller than a pea to as large as a softball and can be very destructive to buildings, vehicles, and crops. Even small hail can cause significant damage to young and tender plants. Hail usually lasts an average of 10 to 20 minutes but may last much longer in some storms. Hail causes \$1 billion in damage to crops and property each year in the U.S.

#### **Location and Extent per Jurisdiction**

##### **Lincoln County**

Lincoln County can be divided into 4 distinct landscapes: 1) Upper Tularosa Valley (Chihuahuan desert), 2) South central mountains, 3) Central Highlands, 4) Eastern Plains and prairie. Thunderstorms are frequent in Lincoln County during the months of July, August and September. Most thunderstorms in the mountains are less severe and duration than the ones in the other parts of the county. The most severe thunderstorms typically build over the mountains and travel east into the plains. These thunderstorms often are severe in nature with lightning, hail and strong winds included along with moderate amounts of rain. Most of the County is rural and strong thunderstorms don't impact the public except within other towns and villages. Per Table 5-15, the magnitude of lightning for Lincoln County consistently experiences storms rating 5 or higher, and it is unlikely that this trend will change.

Due to the Lincoln County landscape of high elevation mountains to eastern plains sheet flooding (flash flooding) can be an issue. Many dry arroyos will become raging rivers during a thunderstorm event. Due to recent year's wildfires removing the flora and fauna from the forest floor causing more intense sheet flooding. The County uses a reverse 911 "Code Red" to notify the public of an approaching storm. Continuous public outreach is required to let the public know what to do to mitigate their homes against the effects of a thunderstorm. Many of the local golf courses, used by local public as well as tourists, have installed lightning awareness alarms that send out a siren when the conditions are right for lightning. Most of these golf courses require the golfers to seek cover during a thunderstorm.

Regarding changes in development within the last five years, Lincoln County has shown minimal commercial and residential development with a decrease in population, which is anticipated to continue within the next five years. Therefore, there has been no change to the vulnerability of the severe weather hazards.

According to The National Climatic Data Center, Lincoln County had 30 reported hail events between 2010 and January 2016. There were no reported deaths, injuries or damages in

dollar estimates. Once the summer monsoon starts, thunderstorms often develop in the afternoons and evenings. Mountainous areas usually see more storms than the plains and desert, although mountain storms tend to be less severe and produce smaller hail. In the plains and over the desert, monsoon thunderstorms sometimes reach severe levels and can produce large hail. Per Table 5-16 below, it is anticipated hail size for Lincoln County would range from a diameter of < .33 to 1.20 inches.

### **Village of Ruidoso**

The Village of Ruidoso (VOR) is dominated by, pinon juniper forests, ponderosa pine forests, and mixed conifer forests. The landscape is steep canyons and ridges sloping toward the Rio Ruidoso. Beetle and insect damage are at epidemic proportions. This combination of insects, disease, drought, and fire caused stress are responsible for significant mortality in some stands/hillsides, and is expected to continue. Due to this mortality and the loss of flora and fauna within the Village sheet flooding (flash flooding) can be more severe during thunderstorms.

Thunderstorms are frequent in the VOR during the months of July, August and September. Most thunderstorms in the mountains are less severe and duration than the ones in the other parts of the county. The most severe thunderstorms typically build over the mountains and travel east into the plains. The flood of 2008 in the Village occurred as a result of low pressure setting up on Sierra Blanca and raining 8" in a 24-hour period. This caused some severe flash flooding in Ruidoso damaging numerous homes and buildings as well as some Village Critical Facilities.

Many of the local golf courses, used by local public as well as tourists, have installed lightning awareness alarms that send out a siren when the conditions are right for lightning. Most of these golf courses require the golfers to seek cover during a thunderstorm. Per Table 5-15, the magnitude of lightning for VOR is anticipated to experience storms rating 1-4, and it is unlikely that this trend will change. Per Table 5-16, anticipated hail size for VOR ranges from a diameter of < .33 to 1.20 inches.

### **City of Ruidoso Downs**

Pinon juniper and ponderosa pine forests with steep canyons and the Rio Ruidoso valley dominate Ruidoso Downs. Commercial and residential buildings are mixed throughout the forested areas within the City limits. The Rio Ruidoso flows from the west city limit, VOR, to the east city limit. Some riparian forests exist along the river.

Thunderstorms frequently occur during the months of July, August and September with wettest month being August. Most thunderstorms in the mountains are less severe and duration than the ones in the eastern parts of the county. The most severe thunderstorms typically build over the mountains and travel east into the plains where they gain intensity. Per Table 5-15, the magnitude of lightning for Ruidoso Downs is anticipated to experience storms rating 1-4, and it is unlikely that this trend will change. The magnitude of hail would range in size from < .33 to 1.20 inches diameter, per Table 5-16.

Due to recent year's wildfires many fire scarred landscapes cause sheet flooding during thunderstorms that impact the water flow of the Rio Ruidoso through Ruidoso Downs. Dry canyons and arroyos will rise very rapidly during thunderstorm events. Many roads, culverts, bar ditches

and crossings are not adequate to deal with the high water that comes with thunderstorms. Thunderstorm public awareness is critical to successful mitigating thunderstorms. Ruidoso Downs Racetrack is in the City of Ruidoso Downs and has had high water during thunderstorms. The Racetrack has lightning sensors/sirens to notify the public of an approaching thunderstorm. The sirens allow for the public to get in out of the way of approaching thunderstorms.

### **Town of Carrizozo**

Carrizozo is located on the northern end of the Tularosa Valley where the landscape transitions from desert to prairie grassland. Carrizozo is surrounded by the Sacramento Mountains to the east; the Oscuro Mountains and the Valley of Fires lava flow to the west, the Chihuahuan desert to the south and the central highlands to the north. The landscape directly around the Town is prairie grassland.

Thunderstorms frequently occur during the months of July, August and September with wettest month being August. Thunderstorms in the Chihuahuan desert are less severe and duration than the storms in the mountains and in the eastern parts of the county. The most severe thunderstorms typically build over the mountains and travel east into the plains where they gain intensity. The weather in Carrizozo can be affected by the mountains in the area to the east and west of town. Per Table 5-15, the magnitude of lightning for the Town of Carrizozo is anticipated to experience storms rating 1-4, and it is unlikely that this trend will change. The magnitude of hail would range in size from < .33 to 1.20 inches diameter, per Table 5-16.

Dry arroyos and canyons can rise significantly and quickly during a thunderstorm event. Public awareness is critical to ensure the public is aware of the dangers of thunderstorms. Thunderstorms cause flash/sheet flooding through town. An engineering study is necessary to determine how to mitigate the flash/sheet street flooding.

### **Village of Capitan**

The Village of Capitan is located in the Lincoln County Central Highlands in the valley floor between the Sacramento Mountains and the Capitan Mountains. The Magado Creek and the Salado creek intersect on the eastern edge of Capitan. Highways US 380, NM 48 and NM 246 also intersect in Capitan. The landscape surrounding the Village as well as throughout the subdivision is pinon juniper and rolling hills.

Thunderstorms frequently occur during the months of July, August and September with wettest month being August. Most thunderstorms in the mountains are less severe and duration than the ones in the eastern parts of the county. The most severe thunderstorms typically build over the mountains and travel east into the plains where they gain intensity.

Due to the recent year's wildfires many fire scarred landscapes cause sheet flooding, during thunderstorms that impact the water flow of the Magado and Salado creeks through Capitan, but never exceeds the banks of these two creeks. Dry canyons and arroyos will rise very rapidly during thunderstorm events. During thunderstorms water funnels off of the highways and flood the streets in the Village. An engineering study is needed to determine the best way to mitigate the waters coming in off the highway. The village of Capitan public works depart has mitigated against thunderstorm runoff adequately throughout the years so there is no longer a threat to damage or life



due to thunderstorms. Per Table 5-15, the magnitude of lightning for the Village of Capitan is anticipated to experience storms rating 1-4, and it is unlikely that this trend will change. The magnitude of hail would range in size from < .33 to 1.20 inches diameter, per Table 5-16.

In past years the Capitan High School would get water into the building during thunderstorms. The Capitan Schools built a new high/middle school this year. The school board moved the location to a more resilient location to prevent future flooding of the high school during thunderstorms. The elementary school floods during thunderstorms, the roof leaks causing black mold, and needs to be replaced or repaired.

### **Village of Corona**

Corona is located in the Lincoln County Central Highlands on the northern county border. US Highway 54, NM 42 and NM 247 intersect in Corona. The landscape is rolling hills covered with pinon juniper forest. Currently, the Village's critical facilities or the public are not threatened by hail, lightning, and flash flooding from thunderstorms because the intensity is very low and no damage has been reported. Thunderstorms are considered to be a nuisance hazard for Corona.

Thunderstorms frequently occur in July, August and September with wettest month being August. Thunderstorms in the Central Highlands are less severe and duration than the storms in the eastern parts of the county. The most severe thunderstorms typically build over the mountains and travel east into the plains gaining intensity. Dry arroyos and canyons can rise significantly and quickly during a thunderstorm event. Thunderstorms cause flash/sheet flooding through the Village without damage to facilities or the public. Therefore, thunderstorms are not profiled as a hazard for Corona.

<b>Table 5-16 Combined National Oceanic and Atmospheric Administration (NOAA)/ Tornado and Storm Research Organization (TORRO) Hailstorm Intensity Scales</b>				
<b>Size Code</b>	<b>Intensity Category</b>	<b>Typical Hail Diameter (inches)</b>	<b>Approximate Size</b>	<b>Typical Damage Impacts</b>
H0	Hard Hail	Up to 0.33	Pea	No damage
H1	Potentially Damaging	0.33 to 0.60	Marble or Mothball	Slight damage to plants, crops
H2	Potentially Damaging	0.60 to 0.80	Dime or grape	Significant damage to fruit, crops, vegetation
H3	Severe	0.80 to 1.20	Nickel to Quarter	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	1.2 to 1.6	Half Dollar to Ping Pong Ball	Widespread glass damage, vehicle bodywork damage



H5	Destructive	1.6 to 2.0	Silver dollar to Golf Ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	2.0 to 2.4	Lime or Egg	Aircraft bodywork dented, brick walls pitted
H7	Very destructive	2.4 to 3.0	Tennis ball	Severe roof damage, risk of serious injuries
H8	Very destructive	3.0 to 3.5	Baseball to Orange	Severe damage to aircraft bodywork
H9	Super Hailstorms	3.5 to 4.0	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	4.0+	Softball and up	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Sources: [www.noaa.gov](http://www.noaa.gov) and [www.torro.org](http://www.torro.org)

### **Historical Occurrences**

Table 5-17 below describes the severe weather Thunderstorm events, per jurisdiction, that occurred between 1/1/2010- 1/1/2016, according to the National Climate Data Center (NCDC). Severe weather thunderstorms includes hail, lightning, and flash flooding.

<b>Table 5- 17: 1/1/2010-1/1/2016 Severe Weather Thunderstorm Historic Occurrences per Jurisdiction</b>		
<b>Thunderstorms/Hail</b>	<b>Date</b>	<b>Detailed Description</b>
Lincoln County	1/1/2010-1/1/2016	14 recorded Thunderstorm/Hail events occurred in Lincoln county with a magnitude between 0.88 in. and 2.75 in. with \$0 of property damage. 3 recorded events in Lincoln County with property damage are listed below.
Lincoln County	7/2/2013	Showers and thunderstorms initially developed over the peaks of the northern high terrain and drifted south throughout the day as storms increased in both coverage and intensity. The magnitude of the hail was 1.75 in. and caused \$1K in property damage.

**Table 5- 17: 1/1/2010-1/1/2016 Severe Weather Thunderstorm Historic Occurrences per Jurisdiction**

Lincoln County	6/7/2013	Severe outflow winds, localized wind damage, large hail, locally heavy rainfall, and significant blowing dust were reported with some of these storms. The most severe thunderstorms produced baseball size hail around Arabela and damaging wind in excess of 70mph. The magnitude of the hail was 2.15 in. and the property damage was \$1k.
Lincoln County	10/20/2015	A widespread burst of showers and thunderstorms with heavy rainfall and severe weather surged across much of the area along and south of Interstate 40. Numerous reports of large hail and flooding were received. The magnitude of the hail was 1.00 in. and the extent of property damage was \$25K.
Village of Ruidoso	5/21/2012	Numerous reports of severe thunderstorm wind gusts, large hail, and even funnel clouds were received. Quarter size hail reported 2 miles southeast of Ruidoso. No property damage was reported.
Ruidoso Downs	6/16/2012	A complex of thunderstorms that developed over northeastern New Mexico moved southeast and produced a large scale severe outflow boundary with winds of 60 to 70 mph. Hail magnitude was 1.00 in. and no property damage was reported.
Ruidoso Downs	8/31/2013	A strong thunderstorm that developed around the Ruidoso area produced pea to nickel size hail and heavy rainfall.
Carrizozo	N/A	From Jan 2010-Jan 2016, there have been no reported hail events with significant impact to the Village of Carrizozo.
Capitan	5/23/2014	Showers and thunderstorms developed over the high plains and moved east as a squall line through the early morning hours on the 24th. Several reports of pea to quarter size hail, strong damaging winds, and flooding were received across eastern New Mexico. \$0 in property damage was reported.

**Table 5- 17: 1/1/2010-1/1/2016 Severe Weather Thunderstorm Historic Occurrences per Jurisdiction**

Corona	6/21/2011	A strong back door cold front brought moisture into eastern New Mexico and up against the east slopes of the central mountains. The combination of moisture, lift and instability triggered showers and thunderstorms over the eastern half of the state, with a couple of the storms turning severe. The magnitude of hail was 0.88 in. with \$0 property damage.
Corona	6/7/2014	Deep moisture and instability aided in the development of supercell thunderstorms during the afternoon and evening hours along the east slopes of the central mountain chain that moved into the eastern plains. Large, damaging hail, strong winds, heavy downpours, and tornadoes were reported. Hail ranging from 2 to 4 inches in diameter. \$50K property damage was reported.
Corona	10/20/2015	A widespread burst of showers and thunderstorms with heavy rainfall and severe weather surged across much of the area along and south of Interstate 40. Numerous reports of large hail and flooding were received. Magnitude of hail was 1.00 in., and \$0 property damage was reported in this event.
Lightning	Date	Detailed Description
Capitan	5/15/2015	Scattered showers and thunderstorms moved northeast over the region, some of which became strong to severe. Quarter size hail was reported at Pep. Unfortunately, a woman was struck by lightning and later passed away.
Flash Flooding	Date	Detailed Description
Lincoln County	7/28/2010	Deep monsoon moisture combined with an easterly wave over southeast New Mexico to create widespread heavy rain across northern and central New Mexico. Hardest hit areas were in the vicinity of the central mountain chain, where several flash floods were observed. \$26K in property damage was reported.

**Table 5- 17: 1/1/2010-1/1/2016 Severe Weather Thunderstorm Historic Occurrences per Jurisdiction**

Lincoln County	8/12/2011	A strong thunderstorm with very heavy rain moved squarely over the White Fire burn scar dumping up to 2 inches per radar estimates. A few hours later, a seemingly typical afternoon thunderstorm north of Clovis produced violent wind gusts as the storm quickly collapsed. \$10K in property damage was reported.
Lincoln County	6/22/2012	Slow moving showers and thunderstorms developed early in the afternoon over the Little Bear burn scar. Heavy and prolonged rain was received over portions of a recent wildfire burn scar leading to flash flooding. Three hundred yards of forest service road 107 washed out between Runnels Stables on northwest end of Little Bear burn scar and Bonito Lake. \$50K in property damage was reported.
Lincoln County	7/5/2012	This pattern maintained a persistent south to north steering component within a deep monsoonal moisture plume over the state. Precipitable water values were 150-200% of normal. Narrow stream channels quickly rose with water levels reaching a depth of 4 feet. the flood waters moved debris and boulders the size of car tires 10 to 15 feet downstream. \$10K in property damage was reported.
Lincoln County	7/7/2012	Monsoonal moisture plume over much of western and central portions of the state led to continued development of isolated to scattered showers and thunderstorms across much of the area. Development of storms to the north of the Little Bear Fire burn scar led to flooding in portions of the scarred area. A partial road collapse occurred along Old Bonito Lake Rd due to flash flood undercuts and encroachments. \$25K in property damage was reported.

**Table 5- 17: 1/1/2010-1/1/2016 Severe Weather Thunderstorm Historic Occurrences per Jurisdiction**

Lincoln County	9/6/2012	A weak back door cold front pushed into the state ushering in lower level moisture and creating a favorable environment for afternoon shower and thunderstorm development. Large rocks and boulders were washed over portions of Forest Road 107 making it impassable. Rainfall amounts of nearly one inch were reported near the area where the flash flooding took place. \$2K in property damage was reported.
Lincoln County	8/1/2013	A persistent area of training thunderstorms over south-central Lincoln County produced heavy rainfall over the Little Bear burn scar. The first round of heavy rainfall dumped around 1 inch of rainfall in the area from the White burn scar west across Ruidoso to the Little Bear burn scar. \$1K in property damage was reported.
Lincoln County	7/14/2014	A couple severe thunderstorms erupted over the area given the presence of strong vertical wind shear. The most severe flooding occurred well after sunset when training thunderstorms around the Espanola area produced prolific rainfall amounts. \$0 in property damage.
Lincoln County	9/4/2014	A monsoon moisture surge containing the remnants of two tropical systems moved into the state from the south and southwest. Mud and debris was reported on State Road 107 west of Bonito Lake. \$0 in property damage.
Lincoln County	9/24/2014	A strong back door cold front shifted southwest over eastern New Mexico on the 24th, setting the stage for severe thunderstorms and more heavy rainfall. Large rocks that disrupted traffic were swept onto US 380 due to intense runoff.\$0 in property damage.

**Table 5- 17: 1/1/2010-1/1/2016 Severe Weather Thunderstorm Historic Occurrences per Jurisdiction**

Lincoln County	7/12/2015	One storm in particular to the west of Ruidoso near Bonito Lake produced a significant localized flash flood near Orchard Campground and Marthas Canyon. Several points on the road were washed over with flood waters, mud, rocks, and debris. A significant wash out with debris near Orchard Campground west of Bonito Lake. A couple places along highway 107 were impassable due to flowing water and debris. Marthas Canyon was the hardest hit. \$10K in property damage was reported.
Lincoln County	9/9/2015	Several storms quickly became strong then eventually severe with large hail and high winds. This activity merged into a large cluster of slow-moving storms around Lincoln County later in the afternoon where localized flash flooding impacted state road 462. \$0 in property damage was reported.
Village of Ruidoso	N/A	From Jan 2010-Jan 2016, there have been no reported Flash Flooding events with a significant impact to the Village of Ruidoso.
Ruidoso Downs	7/13/2011	Heavy rains led to flooding in Allison Canyon along U.S. Highway 70 near mile marker 268. Fortunately, residents in the River Ranch RV park along the canyon were evacuated prior to the high water reaching the ranch. An estimated 4 to 6 feet of water flowed through the area. Fortunately, the RV park did not sustain much damage. \$0 in property damage was reported.

**Table 5- 17: 1/1/2010-1/1/2016 Severe Weather Thunderstorm Historic Occurrences per Jurisdiction**

Ruidoso Downs	8/3/11	Heavy rain fell early in the afternoon across the White Fire burn scar. Fortunately only minor flooding ensued at the time. However, as another round of showers and thunderstorms moved over the burn scar in the evening, more significant flooding resulted. Culverts that were built along a road near Seeping Springs that crossed Allison Canyon were already at capacity from the earlier rains. The additional precipitation caused them to give way, which lead to rapid flows along Allison Canyon. These waters reach the River Ranch RV Park along Highway 70. The water was estimated to be three feet high, which topped the concrete barriers that were installed to protect the park. Fortunately, the park did not sustain any damage. \$10K in property damage was reported.
Ruidoso Downs	8/5/2011.	A thunderstorm slowing moving to the northeast, dropped significant amounts of rain between Ruidoso and Glencoe. Though the Rio Ruidoso was running high and fast downstream of Ruidoso Downs, the most significant flooding was within the town itself. Water approximately two feet deep flooded the intersection of Highlands and Joe Welch. An SUV attempted to cross the waters but was unsuccessful. Flooding and debris from the White Fire burn scar was also noted along Highway 70. \$0 in property damage was reported.



**Table 5- 17: 1/1/2010-1/1/2016 Severe Weather Thunderstorm Historic Occurrences per Jurisdiction**

Ruidoso Downs	8/20/2011	Heavy rains on the eastern half of the White Fire burn scar led to flash flooding along the Rio Ruidoso downstream toward Glencoe and Hondo. Radar estimates near 3 inches of rain fell in this area. Emergency management reported the Rio Ruidoso out of its banks for a 6 to 10 mile stretch downstream of the White Fire burn scar. High water levels in the canyons and arroyos on the east and south side of the burn scar flowed into the Rio Ruidoso, causing it to flood. Debris from the burn area was piled up on the banks. Near mile marker 272.5 on Highway 70, portions of the Rio de Oso Trailer park was underwater. \$0 in property damage was reported.
Ruidoso Downs	8/21/2011	Upper level high pressure was centered over New Mexico resulting in very light and erratic steering winds aloft. This coupled with sufficient moisture aided in the development of slow-moving heavy rain producing thunderstorms over and near the central mountain chain and western high terrain. Flash flooding was observed over the Little Bear burn scar. The Rio Ruidoso was reported to be out of its banks along U.S. Highway 70 at Fox Cave. \$0 in property damage was reported.
Carrizozo	N/A	From Jan 2010-Jan 2016, there have been no reported Flash Flooding events with a significant impact to the Village of Carrizozo.

**Table 5- 17: 1/1/2010-1/1/2016 Severe Weather Thunderstorm Historic Occurrences per Jurisdiction**

Capitan	9/21/2014	Many areas from the upper Gila region of Catron County eastward across Socorro and Lincoln counties into the eastern plains reported 4 day rainfall amounts of 2 to nearly 5 inches. This prolonged heavy rainfall event and abundant remnant moisture set the stage for flash flooding as a second upper disturbance approached from northwestern Mexico on the 21st. A large area of heavy rainfall shifted very slowly north across Lincoln and Chaves counties resulting in flash flooding. Flooding was reported on State Road 246 at mile markers 4,27-29, and 55-56. Pavement was damaged at mile marker 29. The highway was closed from Capitan to Roswell. \$130K in property damage was reported.
Lincoln County	9/18/2013	A weak upper level jet axis focused directly over central New Mexico interacted with abundant low level moisture entrenched over the region to produce scattered strong to severe thunderstorms. These storms were slow-moving and in many cases trained over the same areas repeatedly through the afternoon and early evening hours. Heavy rainfall with this convective activity fell on already saturated soil conditions and exacerbated flooding concerns after a historic week of flooding. NM 247 closed between mile markers 0 and 48 due to flooding. \$0 in property damage was reported.
Lincoln County	8/10/2015	The largest hail reported was quarter size near Logan, an area that also received 5.05 inches of rain throughout the event. The heavy rains produced flash flooding along U.S. Highway 54 between Corona and Carrizozo, causing the road to be closed for 45 minutes. \$10K in property damage was reported.

### **Probability of Occurrence**

When calculating severe weather Thunderstorm probability, the MPT agreed to use the Priority Risk Index (PRI), explained further in Table 5-28. Probability in Table 5-18 below is calculated from the following criteria:

- Unlikely – Less than 1% annual probability
- Possible – Between 1 and 10% annual probability
- Likely – Between 10 and 100% annual probability
- Highly Likely – 100% annual probability

**Table 5-18: Thunderstorm Probability of Occurrence**

Thunderstorms Probability of Occurrence per Jurisdiction							
JURISDICTION	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
LINCOLN COUNTY	THUNDER-STORMS	LIKELY	LIMITED	MODERATE	6 - 12 HRS	< WEEK	3.2
RUIDOSO	THUNDER-STORMS	LIKELY	LIMITED	MODERATE	> 24 HRS	< WEEK	3.0
RUIDOSO DOWNS	THUNDER-STORMS	LIKELY	LIMITED	MODERATE	12 -24 HRS	< WEEK	2.2
CARRIZOZO	THUNDER-STORMS	LIKELY	LIMITED	MODERATE	12 -24 HRS	< WEEK	2
CAPTAN	THUNDER-STORMS	LIKELY	LIMITED	MODERATE	12 - 24 HRS	< WEEK	2.5
CORONA	THUNDER-STORMS	UNLIKELY	MINOR	SMALL	12- 24 HRS	< WEEK	1.4

#### 5.2.3.2 Winter Storms

### **Description**

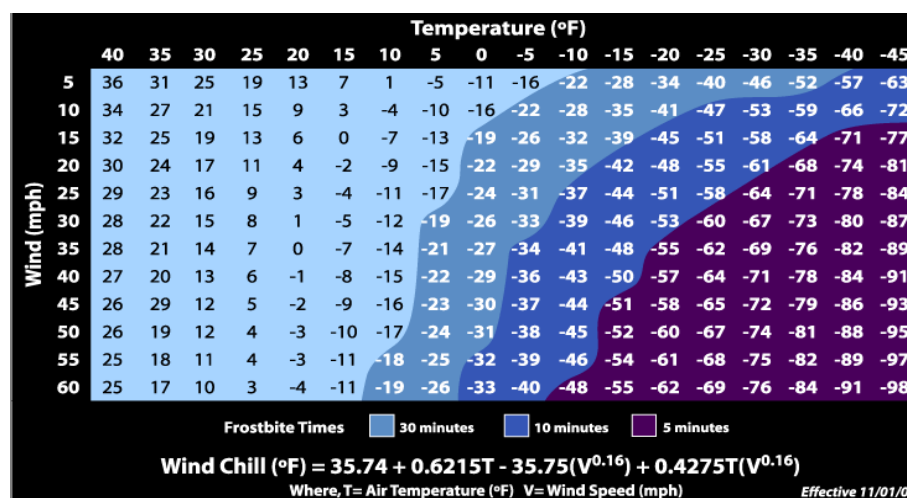
Severe winter storms can vary in size and strength and include heavy snowstorms, blizzards, ice storms, freezing drizzle or rain, sleet, and blowing and drifting snow. Extremely cold temperatures accompanied by strong winds result in potentially lethal wind chills.

A variety of weather phenomena and conditions can occur during winter storms. The following are NWS-approved definitions of winter storm elements:

- **Heavy snowfall** - the accumulation of 6 or more inches of snow in a 12-hour period or 8 or more inches in a 24-hour period.
- **Blizzard** - the occurrence of sustained wind speeds in excess of 35 mph accompanied by heavy snowfall or large amounts of blowing or drifting snow.

- **Ice storm** - an occurrence where rain falls from warmer upper layers of the atmosphere to the colder ground, freezing upon contact with the ground and exposed objects near the ground.
- **Freezing drizzle/freezing rain** - the effect of drizzle or rain freezing upon impact on objects that have a temperature of 32° F or below.
- **Sleet** - solid grains or pellets of ice formed by the freezing of raindrops or the refreezing of largely melted snowflakes. This ice does not cling to surfaces.
- **Wind chill** - an apparent temperature that describes the combined effect of wind and low air temperatures on exposed skin.

The wind chill temperature is a measure of how cold the wind makes real air temperature feel to the human body. Since wind can dramatically accelerate heat loss from the body, a blustery 30° day would feel just as cold as a calm day with 0° temperatures. On November 1, 2001, the NWS released a scientifically accurate equation, which is used for calculating wind chill. (Figure 5-8: Please note that it is not applicable in calm winds or when the temperature is more than 50°F.)



Source: National Weather Service and NOAA

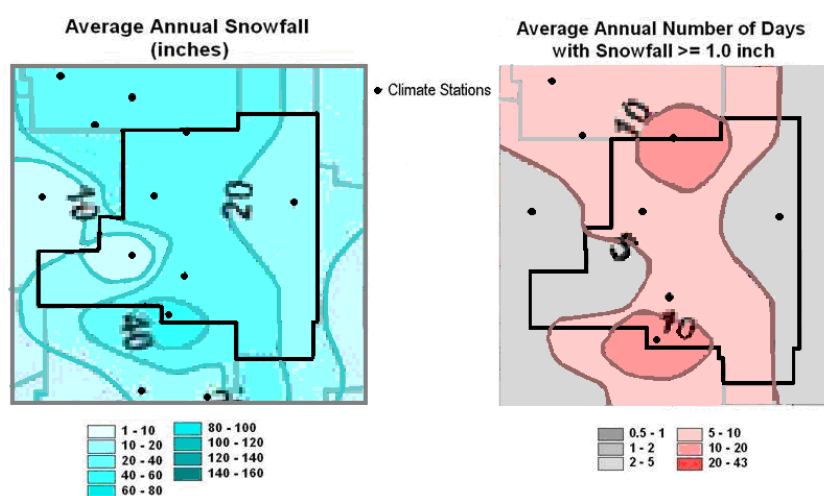
**Figure 5-8 Wind Chill Chart**

A severe winter storm for Lincoln County as defined by the NWS is 4 or more inches of snowfall below 7,500 feet elevation or 6 or more inches of snowfall above 7,500 feet elevation in a 12- hour period, or 6 or more inches of snowfall below 7,500 feet elevation or 9 inches of snowfall above 7,500 feet elevation in a 24-hour period.

Most winter precipitation in New Mexico is associated with Pacific Ocean storms as they move across the state from west to east. As the storms move inland, moisture falls on the coastal

and inland mountain ranges of California, Nevada, Arizona, and Utah. If conditions are right, the remaining moisture falls on the slopes of New Mexico's high mountain chains.

Much of the precipitation that falls as snow in the mountain areas may occur as either rain or snow in the valleys. The average annual snowfall ranges from about 3 inches in the southern desert and southeastern plains to more than 100 inches in the northern mountains (Figure 5-9). It can, on rare occasions, exceed 300 inches in the highest mountains. January is usually the coldest month, with average daytime temperatures ranging from the middle 50s in the southern and central valleys to the middle 30s in the higher elevations. Minimum temperatures below freezing are common in all sections of the state during the winter. Subzero temperatures are rare, except in the mountains. The lowest temperature ever officially recorded was -50° F at Gavilan on February 1, 1951. An unofficial low temperature of -57° F at Ciniza was reported by the press on January 13, 1963.<sup>1</sup> <http://www.wrcc.dri.edu/narratives/NEWMEXICO.htm>



Source: National Weather Service, Albuquerque Office

**Figure 5-9 Lincoln County Snowfall Distributions**

### **Historical Occurrences**

The NCDC has reported 61 severe winter storm events in Lincoln County between January 2010 and January 2016. These storms resulted in a total of \$1 million in property damage. Table 5-19 shows the historic occurrences of severe winter storms per jurisdiction.

**Table 5-19: 1/1/2010-1/1/2016 Winter Storms Historic Occurrences per Jurisdiction**

Winter Storms	Date 1/2010-1/2016	Detailed Description
South Central Highlands – covers the Village of Ruidoso and the City of Ruidoso Downs region.	20 reported events	These severe winter storm events consisted of heavy snow ranging from moderate 1 in. to 16 in. \$0 in property damage was reported.

**Table 5-19: 1/1/2010-1/1/2016 Winter Storms Historic Occurrences per Jurisdiction**

Winter Storms	Date 1/2010-1/2016	Detailed Description
Upper Tularosa Valley – covers the Village of Carrizozo region.	7 reported events	These severe winter storm events consisted of heavy snow ranging from moderate 1 in. to 8 in. \$0 in property damage was reported.
South Central Mountains – covers the Town of Capitan and the Village of Corona region.	18 reported events	These severe winter storm events consisted of heavy snow ranging from moderate 1 in. to 16 in. \$0 in property damage was reported.
Eastern Lincoln County	16 reported events	These severe winter storm events consisted of heavy snow ranging from moderate 1 in. to 15 in. \$0 in property damage was reported in all events, except for the severe winter storm listed below.
Eastern Lincoln County	12/26/2015	Heavy snow and high winds paralyzed much of eastern Lincoln County through the 30th. Snowfall amounts averaged 12 to 15 inches. The NM EOC reported that a several mile stretch of State Road 246 was buried in a drift up to 15 feet. All roads were closed across this area for a couple days. A large amount of livestock and range land animals were expected to have perished in this event. \$1M in property damage was reported.

In December 1997, a series of heavy snow events produced totals of 15 to 30 inches across eastern and central New Mexico just before Christmas. Periods of light snow actually began about the 20th and then intensified during the 22nd through the 25th as tropical moisture began to feed a large, nearly stationary upper level low over southwest New Mexico. Lincoln County experienced road closures that lasted 2 weeks, into January. The total damages, including that of other counties, exceeded \$6.5 million but indirect damages exceeded \$20 million.

In December 2015, heavy snow and high winds paralyzed much of eastern Lincoln County through the 30th. Snowfall amounts averaged 12 to 15 inches. The entire stretch of Interstate 40 from Albuquerque to Amarillo was shut down for nearly 36 hours. A Civil Emergency was declared for Quay, Curry, Roosevelt, De Baca, Chaves, and eastern Lincoln counties as dozens of motorists were stranded in their vehicles in 6 to 10 foot snow drifts. Department of Public Safety assisted a total of 455 motorists. Emergency response personnel were even stranded trying to reach these motorists. Residents were blockaded in their homes with drifts up to the top of roofs. Xcel Energy reported power outages in at least 14,200 residences across eastern New Mexico and at least 30,000 residential disruptions during the storm. Numerous trees and power lines were downed as well as several structures due to the weight of heavy snow. Snowfall accumulations of 15 to 30 inches were common from the central mountain chain eastward across much of the plains. Ski Apache reported a whopping 41 inches. Department of Agriculture reported around 12,000 adult milking cows perished in the storm and between 30,000 and 50,000 young livestock died. A couple of 1-day

snowfall records were broken with this event. One person died from exposure in Albuquerque and another while shoveling snow in Roswell. Currently, Ruidoso and Ruidoso Downs critical facilities or the public are not threatened by winter storm because there are no previous occurrences and no damage has been reported. Winter storms are considered to be a nuisance hazard for Ruidoso and Ruidoso Downs. Therefore, winter storms are not profiled for these communities.

### **Location and Extent per Jurisdiction**

#### **Lincoln County**

The mountainous areas of Lincoln County are more likely to receive snow and cold than the plains and desert, but residents of high altitude areas are more likely to be prepared for these conditions, even if they become extreme. These areas have had no damage to report from winter storms which is why this hazard is not profiled for the Village of Ruidoso and City of Ruidoso Downs. Severe winter weather is much more likely to have a serious impact on major population centers and transportation routes, most of which are not located in the high mountains. The plains and desert areas are more susceptible to high winds that contribute to the drifting of snow, and a snow storm that would hardly be noticed in the higher altitudes could present a serious hazard to people in the lower altitudes. If a severe winter storm were to cause a power failure the effect could be very serious. Any accumulation of ice or snow on the roads is a hazardous situation and can lead to widespread road and highway closures that can strand motorists.

New Mexico State Police have the power to close certain highways in emergencies. In cases of emergency where the condition of a state highway presents a substantial danger to vehicular travel by reason of storm, fire, accident, spillage of hazardous materials or other unusual or dangerous conditions, may close the highway to vehicular travel until the New Mexico State Police determines otherwise. This regulation is broad enough to allow for closure for any type of winter storm event, but it is also difficult to define what constitutes “dangerous conditions.” Table 5-18 provides probability data for severe weather events in Lincoln County. The magnitude for winter storms in this county is anticipated to range from moderate to heavy snow, 1 to 15 inches, with a wind chill of <10 mph to 50 mph wind, and temperatures that can exceed below 0

Regarding changes in development within the last five years, Lincoln County has shown minimal commercial and residential development with a decrease in population, which is anticipated to continue within the next five years. Therefore, there has been no change to the vulnerability of the severe weather hazards.

#### **Town of Carrizozo**

The Town of Carrizozo rests on the northern lip of the Tularosa basin, in a region where the ecology changes very rapidly. The town lies at an elevation of 5400 feet (1.6 km), and as you head north the transition from desert basin to high plains grassland is very fast. Typical snowfall lasts a day or two, but a severe snow storm closes Hwy 54 and 38 which crosses through town, stranding travelers on the road, forcing Carrizozo to provide shelter. This becomes an economic burden every year that the small town has to handle. The magnitude for winter storms in Carrizozo is anticipated to range from moderate to heavy snow, 1 to 15 inches, with a wind chill of < 10 mph to 50 mph, and temperatures that can exceed below 0.



### Village of Capitan

The town is located in the heart of historic Lincoln County surrounded by cattle ranches, situated between the Capitan and Sacramento Mountains at an elevation of 6,530 feet with a terrain of rolling hills with Pinyon-juniper. On average, the Capitan receives at least one or two severe winter storms per year. Heavy snow and ice can paralyze the town's infrastructure and services, stranding commuters, and disrupting emergency and medical services. Accumulations of heavy snow and ice can cause roofs to collapse and knock down trees and power lines. The magnitude for winter storms in Capitan is anticipated to range from moderate to heavy snow, 1 to 10 inches, with a wind chill of <10 mph to 50 mph wind, and temperatures that can exceed below 0.

### Village of Corona

The Village of Corona is a small rural community in Lincoln County. The village is a rural/ranching community and is positioned 34 miles south of Vaughn and 47 miles north of Carrizozo on U.S. Highway 54. There are no standard loss estimation models or methodologies for winter storms. Potential losses from winter storms are, in most cases, indirect and therefore difficult to quantify, but the Village of Corona is a very small community and any severe winter weather can be an economic burden. The magnitude for winter storms in the Village of Corona is anticipated to range from moderate to heavy snow, 1 to 10 inches, with a wind chill of <10 mph wind to 50 mph wind and temperatures that can exceed below 0.

### Probability of Occurrence

Calculating probability of Winter Storms, the MPT used the Priority Risk Index (PRI), explained in Table 5-28. Probability in Table 5-20 below is calculated from the following:

- Unlikely – Less than 1% annual probability
- Possible – Between 1 and 10% annual probability
- Likely – Between 10 and 100% annual probability
- Highly Likely – 100% annual probability

**Table 5-20: Winter Storm Probability of Occurrence**

Winter Storms Probability of Occurrence per Jurisdiction							
JURISDICTION	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
LINCOLN COUNTY	WINTER STORMS	LIKELY	LIMITED	MODERATE	6 - 12 HRS	< WEEK	3.2
RUIDOSO	WINTER STORMS	NOT A SELECTED HAZARD FOR THE VILLAGE OF RUIDOSO					
RUIDOSO DOWNS	WINTER STORMS	NOT A SELECTED HAZARD FOR THE CITY OF RUIDOSOS DOWNS					
CARRIZOZO	WINTER STORMS	LIKELY	LIMITED	MODERATE	12 - 24 HRS	< WEEK	2
CAPITIAN	WINTER STORMS	POSSIBLE	LIMITED	MODERATE	12 - 24 HRS	< WEEK	2.3
CORONA	WINTER STORMS	POSSIBLE	LIMITED	MODERATE	12- 24 HRS	< WEEK	2.3

5.2.4 *Drought*

**Description**

Drought is a condition of climatic dryness that reduces soil moisture, water, or snow levels below the minimum necessary for sustaining plant, animal, and economic systems. Drought conditions are usually not uniform over the entire state. Local and regional differences in weather, soil condition, geology, vegetation, and human influence need to be considered when assessing the impact of drought on any particular location.

The most commonly used drought definitions are based on meteorological, agricultural, hydrological, and socio-economic effects.

- **Meteorological** drought is defined as a period of substantially diminished precipitation duration and/or intensity. The commonly used definition of meteorological drought is an interval of time, generally on the order of months or years, during which the actual moisture supply at a given place consistently falls below the climatically appropriate moisture supply.
- **Agricultural** drought occurs when soil moisture is inadequate and does not meet the needs of a particular crop at a particular time. Agricultural drought usually occurs after or during meteorological drought but before hydrological drought and can affect livestock and other dry-land agricultural operations.
- **Hydrological** drought refers to deficiencies in surface and subsurface water supplies. It is measured as stream flow, snow pack, and as lake, reservoir, and groundwater levels. There is usually a delay between lack of rain or snow and less measurable water in streams, lakes, and reservoirs. Therefore, hydrological measurements tend to lag behind other drought indicators.
- **Socioeconomic** drought occurs when physical water shortages start to affect the health, well-being, and quality of life of the people or when the drought starts to affect the supply and demand of an economic product.

Although different types of drought may occur at the same time, they can also occur independently of one another. Drought differs from other natural hazards in three ways. First, the onset and end of a drought are difficult to determine due to the slow accumulation and lingering effects of an event after its apparent end. Second, the lack of an exact and universally accepted definition adds to the confusion of its existence and severity. Third, in contrast to other natural hazards, the impact of drought is less obvious and may be spread over a larger geographic area. These characteristics have hindered the preparation of drought contingency or mitigation plans by many governments.

**Location and Extent per Jurisdiction**

**Lincoln County**

Lincoln County, along with the rest of New Mexico, is entering the fifth year of a drought, which magnifies the challenge of balancing limited water supplies with growing demand. A drought is caused by a variety of factors. Scientists who study climate changes believe that conditions in the North Atlantic Ocean and the Eastern Pacific Ocean play a significant role in determining the amount of precipitation that New Mexico and the rest of the country receive. Studies show current conditions in those two oceans are similar to conditions that existed during the severe drought of the late 1940s and 1950s in New Mexico.

Drought is a regular event in all areas of Lincoln County, occurring in recurring cycles. Experts predict that drought conditions are likely to continue for the foreseeable future. The vegetation condition across the County may range from pre-drought to severe drought conditions.

The majority of Lincoln County is dominated by a high desert, with grasslands, pinon juniper forests, ponderosa pine forests, and dry mixed conifer forests occurring at progressively higher elevations. Stand densities in untreated forest are higher than historical norms. As of 2014, beetle and insect damage are at epidemic proportions. This combination of insects, disease, drought, and fire caused stress are responsible for significant mortality in some stands/hillsides, and is expected to continue. This mortality increases fire risk while dead trees hold needles, and will contribute to increased fuel loading as dead trees fall to the forest floor.

The majority of Lincoln County is considered rural and being used by ranchers to raise cattle, horses and sheep. Drought significantly impacts livestock feed by reducing the available grass and browse. In the past ranchers have had to liquidate herds to save the landscape. Any drought will cause direct impact to the farmers and ranchers, which will indirectly impact the economic viability of the County.

Drinking water systems throughout the County have been impacted during the drought periods. These wells should be kept in tip top shape at all times so water loss is not an issue. Due to numerous years of ongoing drought many drinking water wells are below their normal water production. Therefore, maintaining wells and infrastructure are paramount to ensure that the public has water to drink.

Approximately 80% of the County (unincorporated Lincoln County) is reliant on wells for water supply which may be impacted by severe drought conditions.

In every drought, agriculture is adversely impacted, especially in non-irrigated areas such as dry land farms and rangelands. Droughts impact individuals (farm owners, tenants, and farm laborers), the agricultural industry, other agriculture-related sectors, and other industries such as tourism and recreation. There is increased danger of forest and wildland fires. Loss of forests and trees increases erosion, causing serious damage to aquatic life, irrigation, and power development by heavy silting of streams, reservoirs, and rivers. Primary areas of concern for droughts impact on agriculture are north Highway 380 and the Hondo Valley.

Regarding changes in development within the last five years, Lincoln County has shown minimal commercial and residential development with a decrease in population, which is anticipated to continue within the next five years. Therefore, there has been no change to the vulnerability of the severe weather hazards.

Drought status is calculated using several indices that measure how much precipitation for a given period of time has deviated from historically established norms. The Palmer drought severity index (PDSI) is used by the U.S. Department of Agriculture (USDA) to determine allocations of grant funds for emergency drought assistance.

The Palmer index (Table 5-21) is based on the supply-and-demand concept of the water balance equation, taking into account more than the precipitation deficit at specific locations. The PDSI provides a measurement of moisture conditions that are “standardized” so that comparisons using the index can be made between locations and months.

**Table 5-21 Palmer Drought Severity Index**

PDSI Classifications	
4.00 or more	Extremely wet
3.00 to 3.99	Very wet
2.00 to 2.99	Moderately wet
1.00 to 1.99	Slightly wet
0.50 to 0.99	Incipient wet spell
0.49 to -0.49	Near normal
-0.50 to -0.99	Incipient dry spell
-1.00 to -1.99	Mild drought
-2.00 to -2.99	Moderate drought
-3.00 to -3.99	Severe drought
-4.00 or less	Extreme drought

Source: <http://drought.unl.edu/whatis/indices.htm>

According to the New Mexico Drought Plan, the latest predictions call for a deepening of the drought in the next few years, even though 2006 was one of the wettest years on record. It is expected that Lincoln County could experience normal to extreme drought conditions.

One final measurement of drought, although one that is highly temporal is the Vegetation Drought Response Index (VegIDRI) which is available for two-week intervals, and can be found at <https://www.ncdc.noaa.gov/sotc/drought/201108>.

Per the Palmer Drought Severity Index (Table5-21), the magnitude for drought in Lincoln County is anticipated to range from near normal through severe drought.

### **Village of Ruidoso**

The majority of the Village of Ruidoso (VOR) is dominated by, pinon juniper forests,

ponderosa pine forests, and mixed conifer forests. Commercial and residential buildings are mixed throughout the forested areas within the Village limits. Therefore, the urban areas are very congested with dense stands of trees and buildings. The wild land and urban interface (WUI) surrounding the VOR is dominated by pinon juniper, ponderosa pine, and mixed conifer forests.

These forested areas whether in the Village or the WUI, are affected by drought. Drought causes trees to be stressed and therefore susceptible to beetle and bug infestation, wildfire and lack of water. When the forests are dry and stressed it impacts two important parts of the Village ecosystem: 1) The scenic value; and 2) fire danger.

Drought also impacts the production of the Village drinking water wells. Wells and the water delivery system must be kept well maintained in order to get all the water available to the public. Any wasted water from leaks or faulty equipment is a waste and may impact the delivery of necessary water. Drought occurs and the production of water wells drop.

### **City of Ruidoso Downs**

Ruidoso Downs is dominated by pinon juniper and ponderosa pine forests. The Rio Ruidoso flows from the west city limit, VOR, to the east city limit. Some riparian forests exist along the river. Ruidoso Downs landscape is from the river valley to steep canyons and ridges on the south around Turkey canyon. The WUI on the south and east sides of the City are also dominated by pinon juniper and ponderosa forests. The Mescalero Apache reservation and USFS lands borders the City on the south.

These forested areas whether in the City or the WUI, are affected by drought. Drought causes trees to be stressed and therefore susceptible to beetle and bug infestation as well as wildfire. When the forests are dry and stressed it impacts two important parts of the City's ecosystem: 1) The scenic value; and 2) fire danger.

Drought also impacts the production of the City's drinking water wells. Wells and the water delivery system must be kept well maintained in order to get all the water available to the public. Any wasted water from leaks or faulty equipment is a waste and may impact the delivery of necessary water. Drought occurs and the production of water wells drop. Per the Palmer Drought Severity Index (Table5-21), the magnitude for drought for VOR is anticipated to range from near normal through severe drought.

### **Town of Carrizozo**

Carrizozo is located on the northern end Tularosa Valley where the landscape transitions from desert to prairie grassland. Carrizozo is surrounded by the Sacramento Mountains to the east; the Oscuro Mountains and the Valley of Fires lava flow to the west, the Chihuahuan desert to the south and the central highlands to the north. The landscape directly around the Town is prairie grassland. The mountains and highlands are covered with pinon juniper, ponderosa and mixed conifer forests. Agriculture (ranching) surrounds Carrizozo. Agriculture is the most affected industry by drought. Therefore, if agriculture is affected negatively by drought then the economy of Carrizozo is impacted negatively.

Drought also impacts the production of the Town's drinking water wells. Wells and the water delivery system must be kept well maintained in order to get all the water available to the public. Any wasted water from leaks or faulty equipment is a waste and may impact the delivery of necessary water. Drought occurs and the production of water wells drop. When well production drops due to drought water conservation efforts become extremely important. Ensuring that the town has enough water during drought periods is very important to the viability of any community including Carrizozo. Per the Palmer Drought Severity Index (Table5-21), the magnitude for drought in the Town of Carrizozo is anticipated to range from near normal through severe drought.

### **Village of Capitan**

The Village of Capitan is located in the Lincoln County Central Highlands in the valley floor between the Sacramento Mountains and the Capitan Mountains. The Magado Creek and the Salado creek intersect on the eastern edge of Capitan. The landscape surrounding the Village as well as throughout the subdivision is pinon juniper on rolling hills. Agriculture (ranching) surrounds Capitan. Agriculture is the most affected industry by drought. Therefore, if agriculture is affected negatively by drought then the economy of Capitan is impacted negatively. During drought periods forests are stressed and more susceptible to wildfire.

As in the surrounding communities, drought also impacts the production of the Village's drinking water wells. Wells and the water delivery system must be kept well maintained in order to get all the water available to the public. Any wasted water from leaks or faulty equipment is a waste and may impact the delivery of necessary water. Drought occurs and the production of water wells drop. When well production drops due to drought water conservation efforts become extremely important. Ensuring that the town has enough water during drought periods is very important to the viability of Capitan. Per the Palmer Drought Severity Index (Table5-21), the magnitude for drought in the Village of Capitan is anticipated to range from near normal through severe drought.

### **Village of Corona**

The Village of Corona is located in the Lincoln County Central Highlands on the northern county border. The landscape within Corona is rolling hills covered with pinon juniper forest. The WUI surrounding the Village is also rolling hills covered with pinon juniper. Agriculture and Ranches surround Corona and agriculture is the most impacted industry from a drought. When agriculture is affected negatively by drought it directly affects the economy of Corona. During drought periods forests are stressed and more susceptible to wildfire.

Drought is one of the few hazards that have the potential to directly or indirectly impact each and every person within the Village, as well as adversely affect the local economy. The impacts would result in mandatory water restrictions associated with domestic supplies, agricultural losses and economic impacts associated with those losses, increased wildland firefighting costs, and increased costs for water. Per the Palmer Drought Severity Index (Table5-21), the magnitude for drought in the Village of Corona is anticipated to range from near normal through severe drought.

### **Historical Occurrences**

Drought events during 2010 through 2016 for Lincoln County have been recorded by the NCDC, but no deaths, injuries, or estimated monetary damages were recorded. Even though the details regarding these events were lacking in the NCDC data, according to the MPT, Lincoln County has experienced losses from drought events. Table 5-22 below shows detailed historic occurrences for drought events, per jurisdiction.

**Table 5-22: 1/1/2010-1/1/2016 Drought - Historic Occurrences per Jurisdiction**

<b>Drought</b>	<b>Date 2010-2016</b>	<b>Detailed Description</b>
South Central Highlands – covers the region of Corona and Capitan.	62 reported events	These reported drought events ranged from moderate drought (D1, Palmer Drought Severity Index (PDSI) between -2.0 and -2.9), severe drought (D2, PDSI between -3.0 and -3.9), extreme drought (D3, PDSI between -4.0 and -4.9), and exceptional drought (D4, PDSI between -5.0 and -5.9).
Upper Tularosa Valley – covers the region of Carrizozo.	55 reported events	These reported drought events ranged from moderate drought (D1, PDSI between -2.0 and -2.9), severe drought (D2, PDSI between -3.0 and -3.9), extreme drought (D3, PDSI between -4.0 and -4.9), and exceptional drought (D4, PDSI between -5.0 and -5.9).
South Central Mountains – covers the region Ruidoso and Ruidoso Downs.	55 reported events	These reported drought events ranged from moderate drought (D1, PDSI between -2.0 and -2.9), severe drought (D2, PDSI between -3.0 and -3.9), extreme drought (D3, PDSI between -4.0 and -4.9), and exceptional drought (D4, PDSI between -5.0 and -5.9).
Eastern Lincoln County – covers the region east of the Sacramento Mountains.	55 reported events	These reported drought events ranged from moderate drought (D1, PDSI between -2.0 and -2.9), severe drought (D2, PDSI between -3.0 and -3.9), extreme drought (D3, PDSI between -4.0 and -4.9), and exceptional drought (D4, PDSI between -5.0 and -5.9).

Drought events during 2010 through 2016 for Lincoln County have been recorded by the NCDC, but no deaths, injuries, or estimated monetary damages were recorded. Even though the



details regarding these events were lacking in the NCDC data, according to the MPT, Lincoln County has experienced losses from drought events.

### **Probability of Occurrence**

When calculating the probability for Drought, the MPT agreed to use the Priority Risk Index (PRI), explained further in Table 5-28. Probability in Table 5-23 below is calculated from the following criteria:

- Unlikely – Less than 1% annual probability
- Possible – Between 1 and 10% annual probability
- Likely – Between 10 and 100% annual probability
- Highly Likely – 100% annual probability

**Table 5-23: Drought Probability of Occurrence**

Drought Probability of Occurrence per Jurisdiction							
JURISDICTION	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
LINCOLN COUNTY	DROUGHT	LIKELY	LIMITED	LARGE	> 24 HRS	> WEEK	3.5
RUIDOSO	DROUGHT	POSSIBLE	LIMITED	SMALL	> 24 HRS	> WEEK	2.1
RUIDOSO DOWNS	DROUGHT	POSSIBLE	MINOR	LARGE	> 24 HRS	> WEEK	2.2
CARRIZOZO	DROUGHT	LIKELY	MINOR	MODERATE	> 24 HRS	> WEEK	2.3
CAPTIAN	DROUGHT	UNLIKELY	LIMITED	LARGE	> 24 HRS	> WEEK	2.2
CORONA	DROUGHT	LIKELY	MINOR	MODERATE	> 24 HRS	> WEEK	2.3

### **Climate Change Impacts**

Increased severity and duration of drought due to climate change is one of the “Key Messages” of the NCA report (Garfin, et.al., 2014). If current predictions are valid, the increase in drought will only magnify the current drought related challenges faced by the county. Accordingly, drought planning and contingencies for mitigating the impacts of drought should factor in longer than expected durations and possibly more frequent drought cycles.

#### *5.2.5 Dam Failure*

### **Description**

Another flood hazard that can affect parts of Lincoln County is dam failure. A dam impounds water in an upstream area or reservoir. The amount of water impounded is measured in acre-feet (i.e., the volume of water that covers an acre of land to a depth of 1 foot).

Any malfunction or abnormality outside the design assumptions and parameters that adversely affects a dam’s primary function is considered a dam failure. A catastrophic dam failure is characterized by a sudden, rapid, and uncontrolled release of impounded water. The sudden

release of water may result in downstream flooding affecting life, property, or both. Flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation, poor construction, vandalism, or acts of terrorism can cause dam failures. The sudden release of the impounded water can occur during a flood that overtops or damages a dam, or it can occur on a clear day if the dam has not been properly constructed or maintained. The threat of a dam failure increases as existing dams get older.

Many dams have been built as retention basins and amenity ponds in new developments. Many small dams are on streams or drainages that are not mapped as floodplains or subject to floodplain regulations. Even when the stream is mapped, the floodplain is usually not based on a dam-breach inundation map, leaving downstream residents unaware of the potential dangers.

The Office of the State Engineer, Dam Safety Bureau regulates the design, construction, reconstruction, modification, removal, abandonment, inspection, operation, and maintenance of dams more than 10 feet high or dams that store more than 10 acre-feet of water. Federal dam owners are required to obtain a permit for a new dam; however, the Office of the State Engineer by law does regulate the continued safety of federal dams. Dams 10 feet or less in height, or dams that store 10 acre-feet or less, generally are not regulated and are considered non-jurisdictional dams. However, if a non-jurisdictional dam threatens life and property due to an unsafe condition, the state engineer can issue a safety order to the owner requiring action to remove the threat.

Standard practice among federal and state dam safety offices is to classify a dam according to the potential impact a dam failure (breach) or mis-operation (unscheduled release) would have on downstream areas. The hazard potential classification system categorizes dams based on the probable loss of human life and the impacts on economic, environmental, and lifeline facilities, such as critical transportation systems and utilities. The Dam Hazard Potential Classification definitions are shown in Table 5-24.

**Table 5-24: Dam Hazard Potential Classifications**

Category	Loss of Life	State Ranking
Low	None Expected	Low economic or environmental losses. Losses principally limited to dam owner's property
Significant	None Expected	Economic loss, environmental damage and disruption of lifeline facilities. Predominantly located in rural areas
High	Expected	Based only on loss of life

### **Location and Extent per Jurisdiction**

#### **Lincoln County**

Of the 495 dams in the state, 395 dams come under the jurisdiction of the Office of the State Engineer, Dam Safety Bureau. Of these, 178 dams are classified as having a high hazard

potential and 88 dams are classified as having a significant hazard potential. The remaining 100 dams are under federal jurisdiction, including the Bureau of Indian Affairs (BIA), the Bureau of Reclamations, and the U.S. Army Corps of Engineers (USACE).

According to the National Inventory of Dams (NID) there are 4 dams located in Lincoln County. Dams in neighboring jurisdictions that may also impact Lincoln County include the Lake Mescalero Dam. Table 5-25 provides an overview of those facilities using data from the NID. No dam hazard potential classifications were provided in the data but information provided by County Emergency Services classifies all dam structures in the County as High hazard for planning purposes. Full EAP's are maintained in the Office of the State Engineer. See Appendix G for a sample of each dam's EAP Breach Inundation Data.

**Table 5-25: Overview of Dams in Lincoln County**

Name	River	Owner	Purpose	EAP? (Y/N)	Classification
Bonito Dam	Rio Bonito	City of Alamogordo	Water Supply	Draft	High
Alto Lake Dam	Eagle Creek	Village of Ruidoso	Water Supply	Y	High
Grindstone Canyon Dam	Grindstone Canyon	Village of Ruidoso	Water Supply	Y	High
Upper Rio Hondo Site No. 1 Dam	Salado Creek and Gyp Spring Canyon	Upper Rio Hondo Soil & Water Conservation District	Flood Control	N	Not provided
Lake Mescalero	Carrizo Creek	BIA	Water Supply, Recreation	Y	High

The location of these dams are illustrated in Figure 5-10.

In 2010, the Office of the State Engineer adopted new regulations for dams. The regulations address the requirements for design and construction of new dams, modifications, or alterations to existing dams and the continued safe operation and maintenance of existing dams. Downstream impacts from a dam failure incident may be severe. As noted in the flood portion of this section, the worst case scenario for flooding would result from failure of the Lake Mescalero and Grindstone Canyon dams which would result in the water flow in the Rio Ruidoso increasing to 40 feet above the streambed through Ruidoso and Ruidoso Downs. After Ruidoso Downs it would be 20 feet above the streambed through the Hondo Valley. The extent of potential impact of a dam failure is described in dam-specific Emergency Action Plans (EAP) that are maintained by the facility and should be provided to County Emergency Services. A new requirement for owners of dams that are classified as having a high or significant hazard potential is preparation,

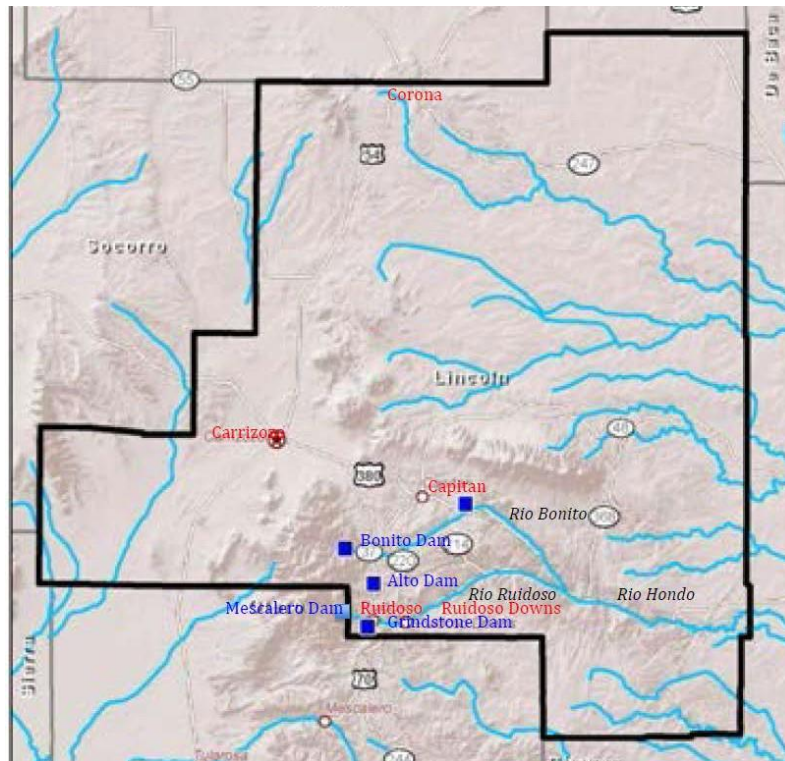
maintenance, and exercise of an EAP. An EAP identifies defensive action to prevent or minimize property damage, injury, or loss of life due to an emergency at the dam. Lake Mescalero, Grindstone, Alto, and Bonito Dams have EAPs, but those documents are not included in this plan as they are case sensitive and not for public viewing. The County does not own any of the identified dams, and at the date of adoption of this plan has not received additional data on impacts resulting from a dam failure at each facility.

Each EAP has an inundation map based on modeling the dam failure under various operating conditions and an evacuation map that has been prepared from the inundation map. There is no state map showing all inundation zones. Local mitigation plans will contain information on dams classified as high and significant hazard potential and inundation maps within their jurisdictions as the information becomes available. An example EAP is listed on the Office of the State Engineer website to assist owners in preparing their EAP.

Since 2005, the Dam Safety Bureau has been using the new dam safety regulations to assess whether dams are deficient. As of spring 2007, the Dam Safety Bureau identified 63 deficient dams classified as having a high hazard potential and 23 deficient dams classified as having a significant hazard potential. Owners of these dams have been advised of the safety deficiency. The State Engineer has taken action against unsafe water storage dams that pose an immediate threat to life and property by ordering storage restrictions. Unfortunately, storage restrictions are not an option for flood control dams because the normal operating condition of the reservoir is empty. Safety-deficient flood control dams still offer some flood protection but will fail and cause catastrophic consequences during extreme storm events. Where owners are unable, or unwilling to upgrade their flood control dams a dilemma exists. Should an order to the breach the dam be issued, resulting in flooding, or allow the unsafe dam to remain, knowing that an extreme storm may cause the dam to fail.



Photo of Grindstone Canyon Dam, retrieved from [www.ruidosonews.com](http://www.ruidosonews.com)



**Figure 5-10 Dams in Lincoln County**

Lake Mescalero & Grindstone Dams: According to EAPs, the flooding from failure of the Lake Mescalero and Grindstone Canyon dams would result, in the leading edge flood wave, in the Rio Ruidoso, to be 40 feet above the streambed and a top width over 1000' through Ruidoso and Ruidoso Downs. Beyond Ruidoso Downs, in Lincoln County, the leading edge of the flood wave would range from 10' to 20' above the streambed and range from 500' to over 1000' top width through the Hondo Valley. These two dams are grouped together because they will impact the same river when they reach the unincorporated areas of Lincoln County.

Alto Dam: According to the Alto Dam EAP the flooding from failure of Alto Dam would result in the leading edge flood wave to be over 20' above the streambed and a top width of over 600' for the first mile. There are 63 structures in the first 5 miles that will be inundated. From a point 5 miles to mile 14 Eagle Creek flows through Forest Service and BLM with no impact on public, structures or infrastructure. At mile 15 Eagle Creek meets the Rio Ruidoso. From this point the leading edge flood wave will average 12' above the streambed and 1000' in width to the county line. From mile 15 to the county line 60 miles downstream the flood will impact numerous farming operations and 202 homes & other structures.

Bonito Dam: The Bonito Dam EAP is not complete therefore the size of the flood is not estimated. Based on similar size dams it is estimated that 253 homes and structures will be inundated along with Ft Stanton, Bonita Park and an RV park. Highway 48, Highway 380 and



Highway 70 will be impacted by floodwaters from the dam breach.

Regarding changes in development within the last five years, Lincoln County has shown minimal commercial and residential development with a decrease in population, which is anticipated to continue within the next five years. Therefore, there has been no change to the vulnerability of the severe weather hazards.

### **Village of Ruidoso**

Table 5-26: Overview of Dams in Village of Ruidoso

<b>Name</b>	<b>River</b>	<b>Owner</b>	<b>Purpose</b>	<b>EAP? (Y/N)</b>	<b>Classification</b>
Alto Lake Dam	Eagle Creek	Village of Ruidoso	Water Supply	Y	High
Grindstone Canyon Dam	Grindstone Canyon	Village of Ruidoso	Water Supply	Y	High
Lake Mescalero	Carrizo Creek	BIA	Water Supply Recreation	Y	High

The Village of Ruidoso has two dams; the Grindstone Canyon Dam is located on the southwestern outskirts of the village, and the Alto Dam is located just 4.3 miles from the center. Out of the two, a dam failure from the Grindstone Canyon Dam would have the most significant impact to Ruidoso.

**Grindstone Dam:** According to the Grindstone EAP, the flooding from failure of the Grindstone dam would result, in the leading edge flood wave, in the Carrizo creek and Rio Ruidoso, to be 33 feet above the streambed and a top width over 1000' through Ruidoso. 474 structures, 2 RV parks, Fire Station 1 and the hospital will be inundated by flood waters during a breach. All public infrastructure above and below ground within 500' of each side of the streambed will be destroyed.

**Lake Mescalero Dam:** According to the Mescalero Dam EAP, the flooding from failure of the Mescalero Dam would result in the leading edge flood wave in Carrizo Creek and Rio Ruidoso to be 30 feet above the streambed and the top width over 700' through Ruidoso. Approximately 450 structures, 2 RV parks, Fire Station 1 and the hospital will be inundated by floodwaters during the event. All public infrastructure above and below ground within 500' of each side of the streambed will be destroyed.

**Alto Dam:** An Alto Dam failure will not impact the Village of Ruidoso. (See Lincoln County)

**City of Ruidoso Downs**

**Table 5-27: Overview of Dams in the City of Ruidoso Downs**

Name	River	Owner	Purpose	EAP? (Y/N)	Classification
Mescalero Dam	Carrizo Creek	BIA	Water Supply/Recreation	Y	High
Grindstone Canyon Dam	Grindstone Canyon	Village of Ruidoso	Water Supply	Y	High

The City of Ruidoso Downs does not own any dams however, they will be impacted by floodwaters from Grindstone and Mescalero dams' failure.

**Grindstone Dam:** According to the Grindstone EAP, the flooding from the failure of the Grindstone dam would result, in the leading edge flood wave, in the Rio Ruidoso, through Ruidoso Downs to average 10 feet above the streambed and a top width average of 900'. Approximately 330 structures, and the Ruidoso Downs Race Track will be inundated by floodwaters during a breach. All public infrastructure above and below ground within 450' of each side of the streambed will be destroyed.

**Lake Mescalero Dam:** Mescalero Dam EAP states the flooding from failure of this dam would result in the leading edge flood wave in Carrizo Creek and Rio Ruidoso to average 16 feet above the streambed and the top width average over 700' through Ruidoso Downs. Approximately 350 structures, and the Ruidoso Downs Race Track will be inundated by floodwaters during the event. All public infrastructure above and below ground within 350' of each side of the streambed will be destroyed.

**Historical Occurrence**

There have been no recorded Dam Failure events in Lincoln County or the Village of Ruidoso.

**Probability of Occurrence**

When calculating the probability for Dam Failure, the MPT agreed to use the Priority Risk Index (PRI), explained further in Table 5-28. Probability in Table 5-28 below is calculated from the following criteria:

- Unlikely – Less than 1% annual probability
- Possible – Between 1 and 10% annual probability
- Likely – Between 10 and 100% annual probability
- Highly Likely – 100% annual probability



Table 5-28: Dam Failure Probability of Occurrence

Dam Failure Probability of Occurrence per Jurisdiction							
JURISDICTION	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
LINCOLN COUNTY	DAM FAILURE	UNLIKELY	CRITICAL	MODERATE	< 6 HRS	> WEEK	2.4
RUIDOSO	DAM FAILURE	POSSIBLE	CATASTROPHIC	MODERATE	< 6 HRS	> WEEK	3.2
RUIDOSO DOWNS	DAM FAILURE	UNLIKELY	CRITICAL	MODERATE	< 6 HRS	> WEEK	2.3
CARRIZOZO	NOT A SELECTED HAZARD FOR CARRIZOZO						
CAPITIAN	NOT A SELECTED HAZARD FOR CAPITAN						
CORONA	NOT A SELECTED HAZARD FOR CORONA						

### 5.3 Vulnerability Analysis Methodology

#### 5.3.1 General

The following sections summarize the methodologies used to perform the vulnerability analysis portion of the risk assessment. For this update, the entire vulnerability analysis was either revised or updated to reflect the availability of new hazard and census data. Specific changes are noted below and/or in Section 5.2.

For the purposes of this vulnerability analysis, the Priority Risk Index (PRI) Evaluation and the loss exposure were used by the MPT for the plan update. Unless otherwise stated in this Plan, the general cutoff date for new historic or hazard profile data is the end of January 2016.

#### 5.3.2 Priority Risk Index (PRI) Evaluation

The first step in the vulnerability analysis (VA) is to assess the perceived overall risk for each of the plan hazards using a tool called the Priority Risk Index<sup>30</sup> (PRI). The PRI value is obtained by assigning varying degrees of risk to four (4) categories for each hazard, and then calculating an index value based on a weighting scheme. Table 5-29 summarizes the PRI risk categories and provides guidance regarding the assignment of values and weighting factors for each category. Table 5-30 shows the PRI per hazard for each jurisdiction.

Application of the PRI is illustrated by the following example below. Assume that the project team is assessing the hazard of flooding, and has decided that the following assignments best describe the flooding hazard for their community:

- Probability = Likely
- Impact = Critical
- Spatial Extent = small
- Warning Time = 12-24 hours
- Duration = Less than 6 hours

The PRI for the flooding hazard would then be:

$$PRI = [(3*0.30)+(3*0.30)+(2*0.20)+ (2*0.10+(2*0.10)]$$

$$PRI = 2.6$$

Table 5-29: Priority Risk Index Calculator Template

PRIORITY RISK INDEX CALCULATOR						
HAZARD:		COMMUNITY:				
PRI Category	Level	Criteria	Index Value	Assigned Weight	Index Value	PRI/Category
Probability	Unlikely	Less than 1% annual probability	1	0.30	0	0.00
	Possible	Between 1 and 10% annual probability	2			
	Likely	Between 10 and 100% annual probability	3			
	Highly Likely	100% annual probability	4			
Impact	Minor	Very few injuries, only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities	1	0.30	0	0.00
	Limited	Minor injuries only. More than 10% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for more than one day	2			
	Critical	Multiple deaths/injuries possible. More than 25% of property in affected area damaged or destroyed. Complete shut down of critical facilities for more than one week	3			
	Catastrophic	High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.	4			
Spatial Extent	Negligible	Less than 1% of area affected	1	0.20	0	0.00
	Small	Between 1 and 10% of area affected	2			
	Moderate	Between 10 and 50% of area affected	3			
	Large	Between 50 and 100% of area affected	4			
Warning Time	More than 24 hours	Self explanatory	1	0.10	0	0.00
	12 to 24 hours	Self explanatory	2			
	6 to 12 hours	Self explanatory	3			
	Less than 6 hours	Self explanatory	4			
Duration	Less than 6 hours	Self explanatory	1	0.10	0	0.00
	Less than 24 hours	Self explanatory	2			
	Less than one week	Self explanatory	3			
	More than one week	Self explanatory	4			
					PRI VALUE	0.00

Table 5-30: PRI Summary by Jurisdiction

PRI SUMMARY							
COMMUNITY: LINCOLN COUNTY							
PRIORITY	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
1	WILDFIRE	LIKELY	CATASTROPHIC	MODERATE	< 6 HRS	> WEEK	3.5
2	THUNDERSTORMS	LIKELY	LIMITED	MODERATE	6 - 12 HRS	< WEEK	3.2
3	WINTER STORMS	LIKELY	LIMITED	MODERATE	6 - 12 HRS	< WEEK	3.2
4	FLOOD	LIKELY	CRITICAL	MODERATE	< 6 HRS	< WEEK	3.1
5	DROUGHT	LIKELY	LIMITED	LARGE	> 24 HRS	> WEEK	2.8
6	DAM FAILURE	UNLIKELY	CRITICAL	MODERATE	< 6 HRS	< 24 HRS	2.4

PRI SUMMARY							
COMMUNITY: VILLAGE OF RUIDOSO							
PRIORITY	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
1	WILDFIRE	HIGHLY LIKELY	CATASTROPHIC	MODERATE	< 6 HRS	< WEEK	3.7
2	DAM FAILURE	POSSIBLE	CATASTROPHIC	MODERATE	< 6 HRS	> WEEK	3.2
3	THUNDERSTORM	LIKELY	LIMITED	MODERATE	> 24 HRS	< WEEK	3.0
4	FLOOD	LIKELY	CRITICAL	SMALL	24-Dec	< WEEK	2.7
5	DROUGHT	POSSIBLE	LIMITED	SMALL	> 24 HRS	> WEEK	2.1

PRI SUMMARY							
COMMUNITY: RUIDOSO DOWNS							
PRIORITY	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
1	WILDFIRE	LIKELY	LIMITED	MODERATE	< 6 HRS	< WEEK	2.8
2	THUNDERSTORMS	LIKELY	LIMITED	MODERATE	12 -24 HRS	< WEEK	2.2
3	FLOOD	POSSIBLE	LIMITED	SMALL	6 - 12 HRS	< WEEK	2.2
4	DROUGHT	POSSIBLE	MINOR	LARGE	> 24HRS	> WEEK	2.2
5	DAM FAILURE	UNLIKELY	LIMITED	LARGE	< 6 HRS	> WEEK	2.3

PRI SUMMARY							
COMMUNITY: CAPITAN							
PRIORITY	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
1	WILDFIRE	LIKELY	LIMITED	SMALL	< 6 HRS	< 24 HRS	2.5
2	THUNDERSTORMS	POSSIBLE	LIMITED	MODERATE	6 - 12 HRS	< WEEK	2.3
3	WINTER STORMS	POSSIBLE	LIMITED	MODERATE	6-12 HRS	< WEEK	2.3
4	DROUGHT	UNLIKELY	LIMITED	LARGE	> 24 HRS	> WEEK	2.2

PRI SUMMARY							
COMMUNITY: CARRIZOZO							
PRIORITY	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
1	DROUGHT	LIKELY	MINOR	MODERATE	> 24	> WEEK	2.3
2	THUNDERSTORMS	LIKELY	LIMITED	MODERATE	12 - 24 HRS	> WEEK	2.0
3	WINTER STORMS	LIKELY	LIMITED	MODERATE	12 - 24 HRS	< WEEK	2.0
4	WILDFIRE	UNLIKELY	LIMITED	NEGLIGIBLE	6 - 12 HRS	< 24 HRS	1.6

PRI SUMMARY							
COMMUNITY: CORONA							
PRIORITY	HAZARD	PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	PRI
1	WILDFIRE	LIKELY	LIMITED	MODERATE	< 6 HRS	> WEEK	2.9
2	WINTER STORMS	POSSIBLE	LIMITED	MODERATE	12 - 24 HRS	< WEEK	2.3
3	DROUGHT	LIKELY	MINOR	MODERATE	> 24 HRS	> WEEK	2.3

### 5.3.3 Asset Inventory

With this update, the 2012 Plan detailed asset inventory was reviewed and updated to reflect the current status, replacement cost information, and the applicable information for the added jurisdictions.

The 2013 New Mexico State Plan defines assets as:

*Any natural or human-caused feature that has value, including, but not limited to people; buildings; infrastructure like bridges, roads, and sewer and water systems; lifelines like electricity and communication resources; or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks.*

The asset inventory is generally tabularized into **critical** and **non-critical** categories, see Table 5-31. **Critical facilities and infrastructure** are systems, structures and infrastructure within a community whose incapacity or destruction would:

- Have a debilitating impact on the defense or economic security of that community.
- Significantly hinder a community's ability to recover following a disaster.

Critical facilities are vital to health, safety and well-being of New Mexicans during time of natural disasters. The following general categories define critical facilities and infrastructure that the MPT used as a guideline for the update.

- Essential facilities vital to the response effort (Emergency Service Facilities, such as police stations, fire stations, rescue squads, public works facilities, hospitals, evacuation shelters, etc.)
- Facilities that house populations requiring special consideration (nursing homes, prisons, juvenile detention centers, schools, secondary education facilities, child care centers, hospitals and facilities, health clinics, and the Office of Medical Investigation, etc.)
- Locations where public health and safety functions are performed or coordinated (State Police District Offices, Emergency Operations Centers, staging areas for emergency operations, Office of Medical Investigator, housing for communications and computer systems, food/medical distribution centers, etc.)
- Communications networks (telephones, emergency medical radio communication system, emergency service radio systems, towers and repeater sites and base stations, television and radio stations, etc.).
- Water supply system/facilities, to include waste water treatment.
- Utilities (power plants, substations, power lines, etc.)
- Transportation networks (roads, bridges, airports, rail terminals, etc.)
- Facilities that can create secondary hazards, such as nuclear power plants and hazardous materials production or storage facilities

Non-critical facilities and infrastructures that are seen as assets such as public libraries, schools, museums, parks, recreational facilities, historic buildings or sites, churches, residential and/or commercial subdivisions, apartment complexes, and so forth, have also been considered by the MPT.

**Table 5-31: Summary of Critical and Non-Critical Facility counts by category and jurisdiction**

Participating Jurisdiction	Critical Facilities and Infrastructure								Non-Critical Facilities and Infrastructure				
	Communications Infrastructure	Electrical Power Systems	Gas and Oil Facilities	Banking and Finance Institutions	Transportation Networks	Water Supply Systems	Government Services	Emergency Services	Educational	Cultural	Business	Residential	Recreational
Lincoln County	6	3	3	0	7	0	5	8	1	5	2	6,115	6
Ruidoso	3	1	5	10	2	5	5	5	5	2	-	-	2
Ruidoso Downs	3	2	3	1	1	2	3	3	1	0	-	-	2
Carrizozo	3	1	2	1	0	2	2	3	1	0	-	-	1
Capitan	3	1	2	1	0	2	4	4	1	1	-	-	1
Corona	2	1	2	0	0	2	3	2	1	0	5	-	0

Table 5-32-1 through Table 5-32-6 specifies each jurisdiction's critical facilities, hazards that may affect each facility, and possible mitigation for those hazards.

Table 5-32-1: Lincoln County Critical facilities, hazards that may affect each facility and possible mitigation for those hazards.		
Communications Infrastructure	Hazards that may Affect the Critical Facility	Possible Mitigation
Buck Mountain tower	Thunderstorms, Winter Storms	Harden against wind
Capitan Tower	Wildfire, Thunderstorms, Winter Storms	Hazardous fuels reduction Replacement
Emergency Operations Center	Thunderstorms, Winter Storms	None
Sheriff's Office (dispatch)	Thunderstorms, Winter Storms	None
White Oaks Tower	Thunderstorms, Winter Storms, Wildfire	Hazardous fuel reduction Access road improvement
Hondo Tower	Thunderstorms, Winter Storms	None
Electric Power Systems	Hazards that may Affect the Critical Facility	Possible Mitigation
PNM substation (Gavilan canyon)	Wildfire, Thunderstorms, Winter Storms	Hazardous fuels reduction and removal of trees in the vicinity of the power lines to mitigate high wind blow overs

Otero County Electric Coop & substations (Rancho Ruidoso)	Thunderstorms, Winter Storms, Wildfire	Hazardous fuels reduction and removal of trees in the vicinity of the power lines to mitigate high wind blow overs
Central New Mexico Electric Coop (power lines and poles)	Thunderstorms, Winter Storms, wildfire	Hazardous fuels reduction and removal of trees in the vicinity of the power lines to mitigate high wind blow overs
<b>Gas &amp; Oil Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Zia Natural Gas sub station	Thunderstorms, Winter Storms	None
El Paso Natural Gas pipeline and substation	Thunderstorms, Winter Storms	None
Trans Western Pipe line and substation	Thunderstorms, Winter Storms	None
<b>Banking and Financial</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
N/A		
<b>Transportation &amp; Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Hondo School Bus system	Thunderstorms, Winter Storms	None
County Roads	Thunderstorms, Winter Storms, Flooding	Repair repetitive damaged roads
Bridges	Thunderstorms, Winter Storms, Flooding	Harden against flooding and flash flooding, raise etc.
Low Water Crossings	Thunderstorms, Winter Storms, Flooding	Replace with improved design crossing
<b>Water &amp; Sewer Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Alto Lakes Water (Wells, Storage tanks, pressure reducing valves (PRV), water lines, electric supply)	Wildfire, Flood, Thunderstorms, Winter Storms	Hazardous fuels reduction, harden against flood and severe weather.
Sun Valley Water (Wells, Storage tanks, PRV, water lines, electric supply)	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather
Cedar Creek Water (Wells, Storage tanks, PRV, water lines, electric supply)	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather
Fawn Ridge Water (Wells, Storage tanks, PRV, water lines, electric supply)	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather
Nogal Water (Wells, Storage tanks, PRV, water lines, electric supply)	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather
Lincoln Water (Wells, Storage tanks, PRV, water lines, electric supply)	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather

CDS Rainmaker utilities (Wells, Storage tanks, PRV, water lines, electric supply)	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather
Hondo School Water System (Wells, Storage tanks, PRV, water lines, electric supply)	Thunderstorms, Winter Storms, Flood	Harden against flood and severe weather
<b>Government Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Hondo Senior Center	Thunderstorms, Winter Storms, Dam Failure	None
Hondo Clinic	Thunderstorms, Winter Storms, Dam Failure	None
Hondo School	Thunderstorms, Winter Storms, Dam Failure	None
<b>Emergency Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Lincoln Fire Station	Wildfire, Thunderstorms, Winter Storms	Hazardous Fuels Reduction
Lincoln Fire (Ft Stanton)	Thunderstorms, Winter Storms	Just built a New Building
White Oaks Fire Station	Thunderstorms, Winter Storms, Wildfire	Hazardous Fuels Reduction
Glencoe Fire Station (main)	Thunderstorms, Winter Storms	None
Glencoe Fire Station (substation)	Thunderstorms, Winter Storms	None
Emergency Operations Center	Thunderstorms, Winter Storms	None
Hondo Fire Station (Picacho)	Thunderstorms, Winter Storms	None
Hondo Fire Station & EMS (Tinne)	Thunderstorms, Winter Storms	In process of relocating and a new building
Arabela Fire Station	Thunderstorms, Winter Storms	None
Nogal Fire Station (main)	Wildfire, Thunderstorms, Winter Storms, Flash flood	Hazardous fuels reduction project planned, Harden against flash flooding
Nogal Fire Station (sub)	Thunderstorms, Winter Storms	Just built New building
Bonita Fire (Sun Valley)	Thunderstorms, Winter Storms	New building planned soon
Bonita Fire (Sonterra)	Thunderstorms, Winter Storms	New facility
Bonita Fire (Copper Ridge)	Thunderstorms, Winter Storms	New facility

**Table 5-32-2: Village of Ruidoso Critical facilities, hazards that may affect each facility and possible mitigation for those hazards.**

<b>Communications Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Village of Ruidoso Police Station: Dispatch	Thunderstorms	Harden against wind
Camelot Ridge Tower	Wildfire, Thunderstorms	Hazardous fuels reduction Harden against high wind, lighting rod
Snowflake Mountain Tower	Wildfire, Thunderstorms	Hazardous fuels reduction Harden against high wind, lighting rod
Windstream Substation	Thunderstorms	None (Talk to Windstream and see what their mitigation is)



Sierra Blanca Regional Airport	Wildfire, Thunderstorms	Hazardous fuels reduction Harden against high wind, lighting rod
<b>Electric Power Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
City Hall Generators	Thunderstorms	Build protection from wind and rain
PNM Power Substation (Gavilan)	Wildfire, Thunderstorms, Flood	Hazardous fuels reduction Hazardous fuels reduction and removal of trees in the vicinity of the power lines to mitigate high wind blow, water diversion and drainage
<b>Gas &amp; Oil Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Zia Gas pipelines and junctions throughout the Village of Ruidoso	Thunderstorms	None (Need to talk to Zia Gas and see what their hazard mitigation plan is)
<b>Banking and Financial</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Wells Fargo	Thunderstorms	None
1 <sup>st</sup> National Bank	Thunderstorms	None
City Bank (3 locations): Lincoln Tower, River Crossing, and El Paso Rd.	Thunderstorms	None
Washington Federal Bank	Thunderstorms	None
Pioneer Bank	Thunderstorms	None
Compass Bank	Thunderstorms	None
<b>Transportation &amp; Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Sierra Blanca Regional Airport	Wildfire, Thunderstorms	Hazardous fuels reduction, Harden against severe weather (high winds), Lightning rods
School Bus Facility	Thunderstorms	None
City Roads, State HWY 70	Thunderstorms, Flooding	Repair repetitively damaged roads and improve drainage
Bridges	Thunderstorms, Flooding	Harden against flooding and flash flooding, raise etc
Power lines crossing over road in Upper Canyon (Main Rd.)	Thunderstorms, Wildfire, Flood	Hazardous fuels reduction, public works project to move power lines underground in conjunction with bridge rebuilding project
<b>Water &amp; Sewer Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Grindstone Canyon Dam	Wildfire, Flood, Thunderstorms	Hazardous fuels reduction, harden against flood and severe weather, Early Warning Notification system

Alto Lake Dam	Wildfire, Thunderstorms, Flood	Hazardous fuels reduction, harden against flood and severe weather
Sewage plants 3 and 4	Wildfire, Thunderstorms, Flood	Hazardous fuels reduction, Fire detection system
Water Towers	Wildfire, Thunderstorms	Hazardous fuels reduction, harden against flood and severe weather
<b>Government Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Village of Ruidoso Village Hall	Thunderstorms, Dam Failure	Strengthen roof and improve drainage around building
Solid Waste Transfer Station on Gavilan	Wildfire, Flood	Hazardous fuels reduction, harden against flood and severe weather
<b>Emergency Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Village of Ruidoso Police Station	Thunderstorms, Wildfire	Strengthen antenna against high wind, Hazardous Fuels Reduction, Harden against severe weather
Village of Ruidoso Fire Stations Fire Station 1 Fire Station 2 Fire Station 3 Close Rd. Sub Station Cree Meadows Dr. Sub Station	Thunderstorms, Wildfire, Flood	Harden against severe weather, Hazardous Fuels Reduction, water diversion and drainage
VOR Public Works maintenance yard and office	Thunderstorms, Wildfire	Hazardous Fuels Reduction, harden against severe weather
<b>Cultural</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Natural Beauty of Ruidoso	Wildfire	Hazardous fuels reduction
<b>Business</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Midtown shops and businesses	Wildfire, Thunderstorms, Flood	Hazardous fuels reduction, Strengthen antenna against high wind, Better drainage and water diversion throughout Midtown
Businesses and hotels along Sudderth Dr. corridor	Wildfire, Flood	Hazardous fuels reduction, Better drainage and water diversion, Early warning system for Grindstone Dam Failure

<b>Table 5-32-3: City of Ruidoso Downs Critical facilities, hazards that may affect each facility and possible mitigation for those hazards.</b>		
<b>Communications Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Police Dispatch Center	Thunderstorms	Harden against wind
Spring Road Tower	Wildfire, Thunderstorms	Hazardous fuels reduction Harden against high wind
GNC Lane Tower	Thunderstorms	None
<b>Electric Power Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
City Hall Generators	Thunderstorms	Build protection from wind and rain
<b>Gas &amp; Oil Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Zia Natural Gas sub station	Thunderstorms	None
Ikard Newsom propane yard	Thunderstorms	None
Cortez Gas storage	Thunderstorms	Tree thinning around storage area
<b>Banking and Financial</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Wells Fargo (Wal-Mart Branch)	Thunderstorms	None
<b>Transportation &amp; Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
School Bus Facility	Thunderstorms	None
City Roads, State HWY 70	Thunderstorms, Flooding	Repair repetitively damaged roads and improve drainage
Bridges	Thunderstorms, Flooding	Harden against flooding and flash flooding, raise etc
<b>Water &amp; Sewer Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Griffith Springs Well	Wildfire, Flood, Thunderstorms,	Hazardous fuels reduction, harden against flood and severe weather.
Denton Well	Wildfire, Thunderstorms, Flood	Hazardous fuels reduction, harden against flood and severe weather
Riverside Well	Wildfire, Thunderstorms, Flood	Hazardous fuels reduction, harden against flood and severe weather
<b>Government Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
City of Ruidoso Downs City Hall	Thunderstorms, Dam Failure	Strengthen roof and improve drainage around building
<b>Emergency Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Police Station	Thunderstorms	Strengthen antenna against high wind
Fire Station	Thunderstorms	Strengthen antenna against high wind

Public Works maintenance yard and office	Thunderstorms, Winter Storms, Wildfire	Hazardous Fuels Reduction
<b>Cultural</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Museum	Thunderstorms, Winter Storms	Improve drainage around building
<b>Business</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Wal-Mart	Wildfire, Thunderstorms, Winter Storms	Hazardous fuels reduction

<b>Table 5-32-4: Town of Carrizozo Critical facilities, hazards that may affect each facility and possible mitigation for those hazards.</b>		
<b>Communications Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
N/A		
<b>Electric Power Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Otero Electric Coop Substation Water Canyon	Wildfire, Thunderstorms, Winter Storms	Hazardous fuels reduction and removal of trees in the vicinity of the power lines to mitigate high wind blow overs
Otero County Electric Coop substations Behind Four Winds	Thunderstorms, Winter Storms, Wildfire	Hazardous fuels reduction and removal of trees in the vicinity of the power lines to mitigate high wind blow overs
Otero County Electric Coop substation next to school	Thunderstorms, Winter Storms, wildfire	Hazardous fuels reduction and removal of trees in the vicinity of the power lines to mitigate high wind blow overs
<b>Gas &amp; Oil Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Zia Natural Gas substation pipelines	Thunderstorms, Winter Storms	None
<b>Banking and Financial</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
N/A		
<b>Transportation &amp; Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
N/A		
<b>Water &amp; Sewer Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Water Filter plant 17 <sup>th</sup> and Water Canyon and power supply	Wildfire, Flood, Thunderstorms, Winter Storms	Hazardous fuels reduction, harden against flood and severe weather.
Waterlines, PRVs, 50% of required fire hydrants, 3 storage tanks (250,000 & 500,000 & 500,000)	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather

East Water well in Water Canyon and power supply	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather
West Water well in Water Canyon and power supply	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather
Pit Well & booster station in Valle Del Sol and power supply	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather
McBride well E Avenue non potable	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather
Carrizozo Sewer Plant at the end of Sacajawea Road liner failures	Wildfire, Thunderstorms, Winter Storms, Flood	Hazardous fuels reduction, harden against flood and severe weather
<b>Government Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Carrizozo Senior Center	Thunderstorms, Winter Storms	None
City Hall	Thunderstorms, Winter Storms, Dam Failure	None
Carrizozo Schools	Thunderstorms, Winter Storms, Dam Failure	None
Carrizozo Public Library and archives	Thunderstorms, Winter Storms	None
Airport on Hangar Lane	Thunderstorms, Winter Storms	None
County Court house on Central	Thunderstorms, Winter Storms	None
Magistrate Judge facility on 11 <sup>th</sup> St.	Thunderstorms, Winter Storms	None
County Detention Center next to airport	Thunderstorms, Winter Storms, Wildfire	None
Public Works shop and yard	Thunderstorms, Winter Storms, Wildfire	None
Solid Waste transfer station	Thunderstorms, Winter Storms, Wildfire	None
<b>Emergency Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Friday Sherrill Fire Station	Wildfire, Thunderstorms, Winter Storms	Hazardous Fuels Reduction
Carlos Zamora Fire Station	Thunderstorms, Winter Storms	Just built a New Building
Police Station Central	Thunderstorms, Winter Storms, Wildfire	Hazardous Fuels Reduction
EMS Station/ambulance garage not manned on Airport Road	Thunderstorms, Winter Storms	None

<b>Table 5-32-5: Village of Capitan Critical facilities, hazards that may affect each facility and possible mitigation for those hazards.</b>		
<b>Communications Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Base Station in the Main Fire Station	Thunderstorms, Winter Storms Wildfire	This Main fire station was built to meet the Nm building code for high wind and sever weather. No mitigation is necessary
<b>Electric Power Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Otero Electric Coop Substation Nogal & 5th	Wildfire, Thunderstorms, Winter Storms	None
Otero Electric Coop power lines	Thunderstorms, Winter Storms, Wildfire	Tree trimming on adjacent properties. The Electric Coop keeps their right aways clear and trimmed.
<b>Gas &amp; Oil Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Zia Natural Gas substation & pipelines on Hwy 246	Thunderstorms, Winter Storms, Wildfire	None
Shell Service Station	Thunderstorms, Winter Storms, Wildfire	None
<b>Banking and Financial</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Washington Federal Bank	Thunderstorms, Winter Storms, Wildfire	None
<b>Transportation &amp; Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Capitan School Busses	Thunderstorms, Winter Storms, Wildfire	None
<b>Water &amp; Sewer Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Water Wells #1, 2 & 3	Wildfire, Thunderstorms, Winter Storms	Generator for backup of power outage, Hazardous Fuels reduction
Waterlines, PRVs, fire hydrants,	Wildfire, Thunderstorms, Winter Storms	Harden against flash flooding and erosion
2 million gallon storage tank & ½ million gallon storage tank on the Brewer ranch (easement)	Wildfire, Thunderstorms, Winter Storms	Maintain the cleared area surrounding the storage tanks.
Shop storage tank 100,000 gallon	Wildfire, Thunderstorms, Winter Storms	Remodeled in 2015, No mitigation necessary
Goodwin storage tank 100,000 gallon	Wildfire, Thunderstorms, Winter Storms	None
Subdivision Storage tanks 2 ea. 200,000 gallon tanks	Wildfire, Thunderstorms, Winter Storms	None
Booster pumps to send water from shop tank to subdivision tanks	Wildfire, Thunderstorms, Winter Storms	Backup Generator

Capitan Sewer Plant and lagoons on the east side of town	Wildfire, Thunderstorms, Winter Storms	Maintain the cleared area surrounding the plant and lagoons, Backup Generator
<b>Government Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Capitan Senior Citizens Center	Thunderstorms, Winter Storms	New building built in 2015 meets the current NM building code
City Hall	Thunderstorms, Winter Storms, Wildfire	Backup generator
Capitan Schools	Thunderstorms, Winter Storms, Wildfire	Backup generators if needed for evacuation centers
Capitan Public Library	Thunderstorms, Winter Storms, Wildfire	Building roof has been replaced with a membrane roof able to withstand high winds and hail. No mitigation necessary
NM State Forestry District office	Thunderstorms, Winter Storms, Wildfire	Newer buildings constructed to meet the current NM building code. No mitigation necessary
USDA Forest Service Capitan Work Center	Thunderstorms, Winter Storms, Wildfire	No mitigation necessary
Upper Hondo Soil and water Conservation district office & shop	Thunderstorms, Winter Storms, Wildfire	Roof was recently replaced with a new membrane roof able to withstand high winds and hail.
Capitan Health Clinic	Thunderstorms, Winter Storms, Wildfire	Constructed in 2014 up to the current NM building code.
Lincoln County Road Department yard and shop	Thunderstorms, Winter Storms, Wildfire	None
2 Capitan Public Works shop and yard	Thunderstorms, Winter Storms, Wildfire	None
Solid Waste transfer station	Thunderstorms, Winter Storms, Wildfire	None
NM Department of Transportation Capitan Patrol shop and yard	Thunderstorms, Winter Storms, Wildfire	None
<b>Emergency Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Virgil Hall Fire, EMS & Police Station	Wildfire, Thunderstorms, Winter Storms	Maintain clear cut area surrounding building
Pat Huey Fire Station	Thunderstorms, Winter Storms, Wildfire	Maintain clear cut area surrounding building

**Table 5-32-6: Village of Corona Critical facilities, hazards that may affect each facility and possible mitigation for those hazards.**

<b>Electric Power Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Central New Mexico Electric Coop Substation corner of Huey Lane and NM 247	Thunderstorms, Winter Storms	None



Central New Mexico Electric Coop power lines	Thunderstorms, Winter Storms, Wildfire	Tree trimming on adjacent properties. The Electric Coop keeps their right ways clear and trimmed.
Corona School Solar Field	Thunderstorms, Winter Storms, Wildfire	None
<b>Gas &amp; Oil Systems</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Kinder Morgan Natural Gas & pipelines south of Corona Mile Marker 159 on Hwy 54	Thunderstorms, Winter Storms, Wildfire	None
<b>Transportation &amp; Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Corona School Busses	Thunderstorms, Winter Storms, Wildfire	None
<b>Water &amp; Sewer Infrastructure</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Water Wells Red Cloud #7 & #8	Wildfire, Thunderstorms, Winter Storms	Generator for backup of power outage, Hazardous Fuels reduction
Waterlines, PRVs, fire hydrants,	Wildfire, Thunderstorms, Winter Storms	Repair and replace fire hydrants
20,000 gallon water tank at the well field	Wildfire, Thunderstorms, Winter Storms	Maintain the cleared area surrounding the storage tanks.
50,000 gallon water storage tank at the well field	Wildfire, Thunderstorms, Winter Storms	Remodeled in 2015, No mitigation necessary
2 - 100,000 gallon water storage tanks in town corner of Quintana and Old Crown	Wildfire, Thunderstorms, Winter Storms	None
1,000,000 gallon pond can be used for fire suppression	Wildfire, Thunderstorms, Winter Storms	None
Water Treatment and control building at the well field	Wildfire, Thunderstorms, Winter Storms	Backup Generator
Corona Sewer Plant	Wildfire, Thunderstorms, Winter Storms,	Maintain the cleared area surrounding the plant, Backup generator
<b>Government Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Corona Senior Citizens Center	Thunderstorms, Winter Storms	Well Maintained building no issues
City Hall, health clinic and public library	Thunderstorms, Winter Storms, Wildfire	Backup generator
Corona Schools	Thunderstorms, Winter Storms, Wildfire	Backup generators if needed for evacuation centers
Corona Public Works shop and yard	Thunderstorms, Winter Storms, Wildfire	Backup generator in place
Solid Waste transfer station	Thunderstorms, Winter Storms, Wildfire	Backup generator

NM Department of Transportation Corona Patrol shop and yard	Thunderstorms, Winter Storms, Wildfire	None
<b>Emergency Services</b>	<b>Hazards that may Affect the Critical Facility</b>	<b>Possible Mitigation</b>
Corona Fire & EMS	Wildfire, Thunderstorms, Winter Storms	Maintain clear cut area surrounding building

#### 5.3.3.1 *Acequias*

The MPT deemed acequias as an important attribute to Lincoln County and agreed that acequias need to be recognized in the HMP. Acequias are vital to the County economic viability and critical entities to the success of agriculture in Lincoln County. Agriculture is a large economic engine for Lincoln County. The MPT agreed to include acequias in this plan because flooding, flash flooding, and wildfires impact acequias. Many of the past flood events have washed out dams, ditches and underground pipes belonging to acequia associations. The acequia representatives did not wish to mitigate any hazards at this time but later they will participate in the update meetings and bring necessary projects to the team for consideration.

Acequias encompass more than being community ditches, they are a way of life, providing a social structure on how to live harmonious with the land and with one another. They are recognized under New Mexico law as political subdivisions of the state. Many of the state's acequia associations have been in existence since the Spanish colonization period of the 17th and 18th centuries. Historically, they have been a principal local government unit for the distribution and use of surface water. The associations have the power of eminent domain and are authorized to borrow money and enter into contracts for maintenance and improvements. Acequia associations do not have the power to tax, so the expenses of maintenance and improvements are borne by the individuals served by the irrigation system.<sup>1</sup>

There are 79 Acequia associations in Lincoln County (see Appendix E). They are located on three separate drainages (rivers). Each of these acequias consists of take-outs, retention ponds, dams, head gates, ditches etc.

- The Rio Bonito begins in the Sacramento Mountains with many tributaries coming together at Bonito Lake. From the lake the Rio Bonito runs east through Ft Stanton and on to a confluence with the Rio Ruidoso to form the Rio Hondo near Hondo, NM. Twenty Acequias are on the Rio Bonito from Government Spring to the confluence with the Rio Ruidoso. Numerous crops and livestock pastures are irrigated from the Rio Bonito acequias.
- The Rio Ruidoso begins in the Sacramento Mountains near Sierra Blanca and travels southeast from Sierra Blanca through the Mescalero Apache Reservation on to the Village of Ruidoso. From there the Rio Ruidoso travels east to the confluence with the Rio Bonito to form the Rio Hondo. Forty-two (42) acequias are on the Rio Ruidoso from Ruidoso to the confluence with the Bonito. Numerous crops and livestock pastures are irrigated from the Rio Ruidoso acequias.

- The Rio Hondo begins at the confluence of the Rio Bonito and the Rio Ruidoso and runs east to the county line. Eighteen (18) acequias are on the Rio Hondo from the confluence to the county line. Numerous crops and livestock pastures are irrigated from the Rio Hondo acequias.

#### *5.3.4 Loss/Exposure Estimations*

In the 2012 Plan, economic loss and human exposure estimates for each of the final hazards identified began with an assessment of the potential exposure of critical and non-critical assets and human populations to those hazards. Estimates of exposure to critical and non-critical assets identified by the community was accomplished by intersecting the asset inventory with the hazard profiles. Human or population exposures were estimated by intersecting the same hazards with 2000 Census Data population statistics that had been re-organized into GIS compatible databases and distributed with HAZUS-MH11. Additional exposure estimates for general residential, commercial, and industrial building stock not specifically identified with the asset inventory, were also accomplished using the HAZUS-MH database, wherein the developers of the HAZUS-MH database have made attempts to correlate building/structure counts to census block data.

Loss estimates for this Plan, see Table 5-33 below, reflect an updated asset inventory, and the use of the most updated U.S. Census block level data for estimating the human (population) and residential structure impacts for each jurisdiction. The procedures for developing loss estimates for this Plan are discussed below.

Economic loss and human exposure estimates for each of the final hazards identified in Section 5.1 begins with an assessment of the potential exposure of assets (PRI), human populations, and residential structures to those hazards. Asset exposure estimates are accomplished by intersecting the asset inventory with the hazard profiles in Section 5.2 and compiling the exposed facility count and replacement values by jurisdiction. Similarly, human population and residential unit exposures are estimated by intersecting the same hazards with the 2010 Census block population and residential unit count data sets. Structure and content replacement costs for assets were assigned to each facility by the corresponding jurisdiction. Structure and content replacement costs for the residential housing counts were geographically assigned based on census data places and average housing cost unit values data from the 2010 U.S. Census database.<sup>1</sup>

Combining the exposure and/or loss results from the asset inventory and 2010 Census database provides a comprehensive depiction of the overall exposure of critical facilities, human population, and residential building stock and the two datasets are considered complimentary and not redundant.

Economic losses to structures and facilities are estimated by multiplying the exposed facility replacement cost estimates by an assumed loss to exposure ratio for the hazard. The loss to exposure ratios used in this Plan are summarized by hazard in Section 5.3. It is important to note the following when reviewing the loss estimate results:

- The loss to exposure ratios are subjective and the estimates are solely intended to

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<sup>6</sup> [http://www.ose.state.nm.us/Acequias/isc\\_acequias.php](http://www.ose.state.nm.us/Acequias/isc_acequias.php)

provide an understanding of relative risk from the hazards and potential magnitude of losses.

- Potential losses reported in this Plan represent an inherent assumption that the hazard occurs county-wide to the magnitude shown on the hazard profile map. The results are intended to present a county-wide loss potential. Any single hazard event will likely only impact a portion of the county and the actual losses would be some fraction of those estimated herein.

**Table 5-33: Loss / Exposure Estimates per Hazard for Each Jurisdiction**

LOSS / EXPOSURE									
COMMUNITY: LINCOLN COUNTY			POPULATION VULNERABILITY						
HAZARD	HOUSING	% DAMAGED /DESTROYED	MEDIAN VALUE	HOUSING ESTIMATED REPLACEMENT COST	TOTAL POPULATION EXPOSED	SECOND HOME/LODGING POPULATION	DISABLED POPULATION	ELDERLY POPULATION	POVERTY POPULATION
WILDFIRE	6115	0.75	\$155,400.00	712,703,250	3498	770	455	770	700
THUNDERSTORMS	6115	0.75	\$155,400.00	712,703,250	1749	392	227	385	350
WINTER STORMS	6115	0.75	\$155,400.00	712,703,250	1749	392	227	385	350
FLOOD	6115	0.75	\$155,400.00	712,703,250	1749	392	227	385	350
DROUGHT	6115	0.75	\$155,400.00	712,703,250	700	157	91	154	140
DAM FAILURE	6115	0.25	\$155,400.00	237,567,750	1749	392	227	385	350

LOSS / EXPOSURE									
COMMUNITY: VILLAGE OF RUIDOSO			POPULATION VULNERABILITY						
HAZARD	HOUSING	% DAMAGED /DESTROYED	MEDIAN VALUE	HOUSING ESTIMATED REPLACEMENT COST	TOTAL POPULATION EXPOSED	SECOND HOME/LODGING POPULATION	DISABLED POPULATION	ELDERLY POPULATION	POVERTY POPULATION
WILDFIRE	8428	0.75	\$161,300.00	1,019,577,300	4014	1084	441	963	522
DAM FAILURE	8428	0.75	\$161,300.00	1,019,577,300	4014	1084	441	963	522
THUNDERSTORMS	8428	0.25	\$161,300.00	339,859,100	2007	542	221	482	261
FLOOD	8428	0.25	\$161,300.00	339,859,100	2007	542	221	482	261
DROUGHT	8428	0.10	\$161,300.00	135,943,640	803	217	88	193	104

LOSS / EXPOSURE									
COMMUNITY: RUIDOSO DOWNS			POPULATION VULNERABILITY						
HAZARD	HOUSING	% DAMAGED /DESTROYED	MEDIAN VALUE	HOUSING ESTIMATED REPLACEMENT COST	TOTAL POPULATION EXPOSED	SECOND HOME/LODGING POPULATION	DISABLED POPULATION	ELDERLY POPULATION	POVERTY POPULATION
WILDFIRE	1550	0.30	\$115,144.00	53,541,960	704	70	35	176	176
THUNDER-STORMS	1550	0.30	\$115,144.00	53,541,960	282	28	14	71	71
FLOOD	1550	0.20	\$115,144.00	35,694,640	282	28	14	71	71
DROUGHT	1550	0.20	\$115,144.00	35,694,640	282	28	14	71	71
DAM FAILURE	1550	0.20	\$115,144.00	35,694,640	282	28	14	71	71

<sup>1</sup>Census Bureau website accessed at: [http://quickfacts.census.gov/qfd/meta/long\\_HSG495213.htm](http://quickfacts.census.gov/qfd/meta/long_HSG495213.htm)

LOSS / EXPOSURE									
COMMUNITY: CARRIZOZO			POPULATION VULNERABILITY						
HAZARD	HOUSING	% DAMAGED /DESTROYED	MEDIAN VALUE	HOUSING ESTIMATED REPLACEMENT COST	TOTAL POPULATION EXPOSED	SECOND HOME/LODGING POPULATION	DISABLED POPULATION	ELDERLY POPULATION	POVERTY POPULATION
DROUGHT	558	0.10	\$82,200.00	4,586,760	10	0	0	2	4
THUNDERSTORM	558	0.10	\$82,200.00	4,586,760	100	0	3	18	38
WINTER STORMS	558	0.10	\$82,200.00	4,586,760	100	0	3	18	38
WILDFIRE	558	0.30	\$82,200.00	13,760,280	10	0	0	2	4

LOSS / EXPOSURE									
COMMUNITY: CAPITAN			POPULATION VULNERABILITY						
HAZARD	HOUSING	% DAMAGED /DESTROYED	MEDIAN VALUE	HOUSING ESTIMATED REPLACEMENT COST	TOTAL POPULATION EXPOSED	SECOND HOME/LODGING POPULATION	DISABLED POPULATION	ELDERLY POPULATION	POVERTY POPULATION
WILDFIRE	804	0.50	\$111,241.00	44,718,882	149	15	4	13	18
THUNDER-STORMS	804	0.30	\$111,241.00	26,831,329	15	2	0	1	2
WINTER STORMS	804	0.30	\$111,241.00	26,831,329	15	2	0	1	2
DROUGHT	804	0.20	\$111,241.00	17,887,553	149	15	4	13	18
FLOOD	804	0.10	\$111,241.00	8,943,776	15	2	0	1	2

LOSS / EXPOSURE									
COMMUNITY: CORONA			POPULATION VULNERABILITY						
HAZARD	HOUSING	% DAMAGED /DESTROYED	MEDIAN VALUE	HOUSING ESTIMATED REPLACEMENT COST	TOTAL POPULATION EXPOSED	SECOND HOME/LODGING POPULATION	DISABLED POPULATION	ELDERLY POPULATION	POVERTY POPULATION
WILDFIRE	120	0.40	\$101,000.00	4,848,000	17	2	1	7	4
THUNDERSTORM	120	0.30	\$101,000.00	3,636,000	17	2	1	7	4
WINTER STORMS	120	0.30	\$101,000.00	3,636,000	17	2	1	7	4
DROUGHT	120	0.30	\$101,000.00	3,636,000	2	0	0	1	1

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## SECTION 6: MITIGATION STRATEGY

**§201.6(c)(3):** *[The plan shall include...] (3) A **mitigation strategy** that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools. This section shall include:*

- (i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.*
- (ii) A section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.*
- (iii) An action plan describing how the actions identified in paragraph (c)(3)(ii) of this section will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.*
- (iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction*

The mitigation strategy provides the “what, when, and how” of actions that will reduce or possibly remove the community’s exposure to hazard risks. According to DMA 2000, the primary components of the mitigation strategy are generally categorized into the following:

- **Goals and Objectives**
- **Capability Assessment**
- **Mitigation Actions/Projects and Implementation Strategy**

The entire 2012 Plan mitigation strategy was reviewed and updated by the MPT, including the addition or augmentation of the section describing National Flood Insurance Program (NFIP) compliance. Specifics of the changes and updates are discussed in the subsections below.

### 6.1 Hazard Mitigation Goals and Objectives

The ultimate mission of all hazard mitigation is the protection and preservation of life and property from the effects of the occurrence of natural hazards. Local governments can make progress toward this goal through coordinated planning and financing to achieve the specific objectives set forth in their hazard mitigation plans. To this end, the MPG’s strategy has been to develop several methods for mitigating the hazards identified in Section 5, Risk Assessment, as the most likely hazards to have severe consequences in Lincoln County and the participating jurisdictions.

The 2012 Plan goals and objectives were reviewed by the MPT and were determined to be adequate and current with the overall mitigation planning goals of all the participating jurisdictions. No changes were made to the goals, so the goals that will be carried forward for the Plan are as follows:

- ◆ Reduce or eliminate risks hazardous conditions that cause loss of life or inflict injury;
- ◆ Reduce or eliminate hazardous conditions that cause property damage;
- ◆ Reduce or eliminate hazardous conditions that degrade important natural resources; and



- ◆ Reduce or eliminate hazardous conditions that impact the community's recovery time in emergency response.

Mitigation strategies in this Hazard Mitigation Plan address critical facilities and any known repetitive-loss structures. Preparedness, response, and recovery measures that were identified to support the concept of mitigation and may directly support identified mitigation actions by the following mitigation objectives:

1. *Increasing awareness of hazards and their effects;*
2. *Decreasing the possibility of impact from the most significant threats;*
3. *Decreasing the vulnerability of critical and non-critical facilities;*
4. *Increasing established response mechanisms by enhancing partnerships; and*
5. *Increasing coordination and communication between levels of government regarding incidents and response mechanisms.*

Mitigation strategy objectives were also address and evaluated from the 2012 plan. The MPT decided from prior discussions emphasizing unified communications amongst the communities, that Objective 5 will be reworded to include, *and communication*, to the prior objective.

The HMP is intended to facilitate these goals and actions and to focus on the county's top priorities for hazard mitigation projects and action items. If other hazards that currently are not deemed significant do become significant in the future, updates to this plan will include mitigation strategies to address them. Critical facilities that lie within high-hazard areas will receive special attention, and especially property that has suffered repeated losses, regardless of whether or not the loss was during a state- or federal-declared disaster.

Mitigation strategies in this Hazard Mitigation Plan address critical facilities and any known repetitive-loss structures. Strategies reflect what the MPT and Stakeholders within Lincoln County would like to mitigate.

## 6.2 Capability Assessment

An important component of the Mitigation Strategy is a review of each participating jurisdiction's resources in order to identify, evaluate, and enhance the capacity of local resources to mitigate the effects of hazards. The capability assessment is comprised of several components:

- ✓ Legal and Regulatory Review – a review of the legal and regulatory capabilities, including ordinances, codes, plans, manuals, guidelines, and technical reports that address hazard mitigation activities.
- ✓ Technical Staff and Personnel – this assessment evaluates and describes the administrative and technical capacity of the jurisdiction's staff and personnel resources.
- ✓ Fiscal Capability – this element summarizes each jurisdiction's fiscal capability to provide the financial resources to implement the mitigation strategy.
- ✓ National Flood Insurance Program (NFIP) Participation – the NFIP contains specific regulatory measures that enable government officials to determine where and how growth occurs relative to flood hazards. Participation in the NFIP is voluntary for local governments, but the program is promoted by FEMA as a basic first step for

implementing and sustaining an effective flood hazard mitigation program, and is a key indicator for measuring local capability as part of this assessment.

### 6.2.1 Jurisdictional Capabilities

Tables 6-1-1 through 6-1-6 summarize the legal and regulatory mitigation capability for each jurisdiction. Information provided includes a brief listing of current codes, mitigation relevant ordinances, plans, and studies/reports. Tables 6-2-1 through 6-2-6 summarize the staff and personnel resources employed by each jurisdiction that serve as a resource for hazard mitigation. Tables 6-3-1 through 6-3-6 summarize the fiscal capability and budgetary tools available to each participating jurisdiction. Each of these three tables are listed below by jurisdiction, and the asterisk\* highlights the jurisdiction's explanation on how these capabilities can be expanded.

**Table 6-1-1: Legal and regulatory capabilities for Lincoln County**

<b>Regulatory Tools for Hazard Mitigation</b>	<b>Description</b>	<b>Responsible Department/Agency</b>
CODES	<ul style="list-style-type: none"> <li>International Building Code</li> </ul>	<ul style="list-style-type: none"> <li>NM State Construction Industries Division</li> </ul>
ORDINANCES	<ul style="list-style-type: none"> <li>Floodplain Management Ordinance</li> <li>Subdivision/Zoning Ordinance</li> </ul>	<ul style="list-style-type: none"> <li>Planning Department</li> <li>Planning Department</li> </ul>
PLANS, MANUALS, and/or GUIDELINES	<ul style="list-style-type: none"> <li>Comprehensive Master Plan 2011</li> <li>CIP Plan 2016</li> <li>Local Emergency Operations Plan 2012</li> <li>CWPP 2014</li> </ul>	<ul style="list-style-type: none"> <li>Planning Department</li> <li>Lincoln County Manager</li> <li>Lincoln County Emergency Manager</li> <li>Lincoln County Emergency</li> </ul>
*Legal and regulatory capabilities for Lincoln County can be expanded by adding a code enforcement officer, and development of a Communication Plan.		

**Table 6-2-1: Technical staff and personnel capabilities for Lincoln County**

<b>Staff/Personnel Resources</b>	<input checked="" type="checkbox"/>	<b>Department/Agency - Position</b>
Planner(s) or engineer(s) with knowledge of land development and land management practices		Contract personnel
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure		Contract personnel
Planner(s) or engineer(s) with an understanding of natural and/or human-caused hazards		Contract personnel
Floodplain Manager	<input checked="" type="checkbox"/>	Managed by Lincoln County
Surveyors		Contract personnel

Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	Lincoln County Emergency Services Director Fire Chief EMS
Personnel skilled in GIS and/or HAZUS		Contract personnel
Scientists familiar with the hazards of the community		Contract personnel
Emergency manager	<input checked="" type="checkbox"/>	Lincoln County Emergency Services Director
Grant writer(s)		Contract personnel
Others		
*Technical staff and personnel capabilities can be expanded by hiring a county engineer.		

**Table 6-3-1: Fiscal capabilities for Lincoln County**

<b>Financial Resources</b>	<b>Accessible or Eligible to Use (Yes, No, Don't Know)</b>	<b>Comments</b>
Community Development Block Grants	Yes	Senior Citizen centers project
Capital Improvements Project funding	Yes	Fire Department improvement
Authority to levy taxes for specific purposes	Yes	Hospital
Fees for water, sewer, gas, or electric service	No	
Impact fees for homebuyers or new developments/homes	No	
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	
Other	Yes	USDA, Rural Development,
*Fiscal capabilities can be expanded by bond issues and State and Federal grants.		

**Table 6-1-2: Legal and regulatory capabilities for Village of Ruidoso**

<b>Regulatory Tools for Hazard Mitigation</b>	<b>Description</b>	<b>Responsible Department/Agency</b>
CODES	<ul style="list-style-type: none"> <li>International Building Code</li> </ul>	<ul style="list-style-type: none"> <li>Planning Department</li> </ul>
ORDINANCES	<ul style="list-style-type: none"> <li>Floodplain Management Ordinance</li> <li>Subdivision/Zoning Ordinance</li> </ul>	<ul style="list-style-type: none"> <li>Lincoln County Floodplain Director</li> <li>Planning Department</li> </ul>
PLANS, MANUALS, and/or GUIDELINES	<ul style="list-style-type: none"> <li>Comprehensive Master Plan</li> <li>CIP Plan</li> <li>EOP</li> <li>CWPP</li> <li>VOR Fuels Management Program</li> </ul>	<ul style="list-style-type: none"> <li>Planning Department</li> <li>City Manager</li> <li>Fire Chief</li> <li>Fire Chief</li> <li>Fire Chief</li> </ul>
* Legal and regulatory capabilities for the Village of Ruidoso can be expanded by developing a Communication Plan.		

Table 6-2-2: Technical staff and personnel capabilities for Village of Ruidoso		
Staff/Personnel Resources	<input checked="" type="checkbox"/>	Department/Agency - Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	<input checked="" type="checkbox"/>	Planning Department
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure		Contract personnel
Planner(s) or engineer(s) with an understanding of natural and/or human-caused hazards		Contract personnel
Floodplain Manager	<input checked="" type="checkbox"/>	Floodplain Manager
Surveyors		Contract personnel
Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	EMS Fire Chief Police Chief
Personnel skilled in GIS and/or HAZUS		Contract personnel
Scientists familiar with the hazards of the community		Contract personnel
Emergency manager	<input checked="" type="checkbox"/>	Fire Chief
Grant writer(s)		Contract personnel
Others		
* Technical staff and personnel capabilities for the Village of Ruidoso can be expanded by hiring a village engineer.		

Table 6-3-2: Fiscal capabilities for Village of Ruidoso		
Financial Resources	Accessible or Eligible to Use (Yes, No, Don't Know)	Comments
Community Development Block Grants	Yes	
Capital Improvements Project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric service	Yes	
Impact fees for homebuyers or new developments/homes	Yes	
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	
Other	Yes	
* Fiscal capabilities for the Village of Ruidoso can be expanded by obtaining State and Federal grants, and low interest loans.		

Table 6-1-3: Legal and regulatory capabilities for City of Ruidoso Downs		
Regulatory Tools for Hazard Mitigation	Description	Responsible Department/Agency

CODES	<ul style="list-style-type: none"> <li>International Building Code</li> </ul>	<ul style="list-style-type: none"> <li>NM State Construction Industries Division</li> </ul>
ORDINANCES	<ul style="list-style-type: none"> <li>Floodplain Management Ordinance</li> <li>Subdivision/Zoning Ordinance</li> </ul>	<ul style="list-style-type: none"> <li>Floodplain Manager</li> <li>Planning and Zoning Department</li> </ul>
PLANS, MANUALS, and/or GUIDELINES	<ul style="list-style-type: none"> <li>Comprehensive Master Plan 2004</li> <li>CIP Plan</li> </ul>	<ul style="list-style-type: none"> <li>Mayor</li> <li>Mayor</li> </ul>
* Legal and regulatory capabilities for the City of Ruidoso Downs can be expanded by developing a Communication Plan.		

**Table 6-2-3: Technical staff and personnel capabilities for City of Ruidoso Downs**

Staff/Personnel Resources	<input checked="" type="checkbox"/>	Department/Agency - Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	<input checked="" type="checkbox"/>	Planning Services Director
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure		Contract personnel
Planner(s) or engineer(s) with an understanding of natural and/or human-caused hazards		Contract personnel
Floodplain Manager	<input checked="" type="checkbox"/>	Floodplain Manager
Surveyors		Contract personnel
Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	Fire Chief EMS
Personnel skilled in GIS and/or HAZUS		Contract personnel
Scientists familiar with the hazards of the community		Contract personnel
Emergency manager	<input checked="" type="checkbox"/>	Fire Chief
Grant writer(s)		Contract personnel
Others		
* Technical staff and personnel capabilities for the City of Ruidoso Downs can be expanded by hiring a Building Code Enforcement Officer and city engineer.		

**Table 6-3-3: Fiscal capabilities for City of Ruidoso Downs**

Financial Resources	Accessible or Eligible to Use (Yes, No, Don't Know)	Comments
Community Development Block Grants	Yes	
Capital Improvements Project funding	Yes	
Authority to levy taxes for specific purposes	Yes	

Fees for water, sewer, gas, or electric service	Yes	
Impact fees for homebuyers or new developments/homes	No	
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	
Other	Yes	
* Fiscal capabilities for the City of Ruidoso Downs can be expanded by State and Federal Grants, and low interest loans.		

**Table 6-1-4: Legal and regulatory capabilities for Town of Carrizozo**

<b>Regulatory Tools for Hazard Mitigation</b>	<b>Description</b>	<b>Responsible Department/Agency</b>
CODES	<ul style="list-style-type: none"> <li>International Building Code</li> </ul>	<ul style="list-style-type: none"> <li>NM State Construction Industries Division</li> </ul>
ORDINANCES	<ul style="list-style-type: none"> <li>Floodplain Management Ordinance</li> </ul>	<ul style="list-style-type: none"> <li>Floodplain Manager</li> </ul>
PLANS, MANUALS, and/or GUIDELINES	<ul style="list-style-type: none"> <li>Comprehensive Master Plan</li> </ul>	<ul style="list-style-type: none"> <li>Mayor</li> </ul>
* Legal and regulatory capabilities for the Town of Carrizozo can be expanded by developing a Communication Plan.		

**Table 6-2-4: Technical staff and personnel capabilities for Town of Carrizozo**

<b>Staff/Personnel Resources</b>	<input checked="" type="checkbox"/>	<b>Department/Agency - Position</b>
Planner(s) or engineer(s) with knowledge of land development and land management practices		Contract personnel
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure		Contract personnel
Planner(s) or engineer(s) with an understanding of natural and/or human-caused hazards		Contract personnel
Floodplain Manager	<input checked="" type="checkbox"/>	Managed by Lincoln County Floodplain Manager
Surveyors		Contract personnel
Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	Fire Chief EMS
Personnel skilled in GIS and/or HAZUS		Contract personnel
Scientists familiar with the hazards of the community		Contract personnel
Emergency manager	<input checked="" type="checkbox"/>	Fire Chief
Grant writer(s)		Contract personnel
Others		

\* Technical staff and personnel capabilities for the Town of Carrizozo can be expanded by hiring a Town engineer and Building Code Enforcement Officer.

**Table 6-3-4: Fiscal capabilities for Town of Carrizozo**

<b>Financial Resources</b>	<b>Accessible or Eligible to Use (Yes, No, Don't Know)</b>	<b>Comments</b>
Community Development Block Grants	Yes	
Capital Improvements Project funding	Yes	
Authority to levy taxes for specific purposes	No	
Fees for water, sewer, gas, or electric service	No	
Impact fees for homebuyers or new developments/homes	No	
Incur debt through general obligation bonds	No	
Incur debt through special tax bonds	Yes	
Other		
* Fiscal capabilities for the Town of Carrizozo can be expanded by State and Federal grants, and low interest loans.		

**Table 6-1-5: Legal and regulatory capabilities for Village of Capitan**

<b>Regulatory Tools for Hazard Mitigation</b>	<b>Description</b>	<b>Responsible Department/Agency</b>
CODES	<ul style="list-style-type: none"> <li>International Building Code</li> </ul>	<ul style="list-style-type: none"> <li>NM State Construction Industries Division</li> </ul>
ORDINANCES	<ul style="list-style-type: none"> <li>Floodplain Management Ordinance</li> </ul>	<ul style="list-style-type: none"> <li>Lincoln County Floodplain Manager</li> </ul>
PLANS, MANUALS, and/or GUIDELINES	<ul style="list-style-type: none"> <li>Comprehensive Master Plan</li> </ul>	<ul style="list-style-type: none"> <li>Mayor</li> </ul>
* Legal and regulatory capabilities for the Village of Capitan can be expanded by developing a Communication Plan.		

**Table 6-2-5: Technical staff and personnel capabilities for Village of Capitan**

<b>Staff/Personnel Resources</b>	<input checked="" type="checkbox"/>	<b>Department/Agency - Position</b>
Planner(s) or engineer(s) with knowledge of land development and land management practices		Contract personnel
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure		Contract personnel
Planner(s) or engineer(s) with an understanding of natural and/or human-caused hazards		Contract personnel



Floodplain Manager	<input checked="" type="checkbox"/>	Managed by Lincoln County Floodplain Manager
Surveyors		Contract personnel
Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	Fire Chief
Personnel skilled in GIS and/or HAZUS		Contract personnel
Scientists familiar with the hazards of the community		Contract personnel
Emergency manager	<input checked="" type="checkbox"/>	Fire Chief
Grant writer(s)		Contract personnel
Others		
* Technical staff and personnel capabilities for the Village of Capitan can be expanded by hiring a Building Code Enforcement Officer and a village engineer.		

**Table 6-3-5: Fiscal capabilities for Village of Capitan**

<b>Financial Resources</b>	<b>Accessible or Eligible to Use (Yes, No, Don't Know)</b>	<b>Comments</b>
Community Development Block Grants	Yes	
Capital Improvements Project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric service	Yes	
Impact fees for homebuyers or new developments/homes	Don't know	
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	
Other	Yes	
* Fiscal capabilities for the Village of Capitan can be expanded by State and Federal grants, and low interest loans.		

**Table 6-1-6: Legal and regulatory capabilities for Village of Corona**

<b>Regulatory Tools for Hazard Mitigation</b>	<b>Description</b>	<b>Responsible Department/Agency</b>
CODES	<ul style="list-style-type: none"> <li>International Building Code</li> </ul>	<ul style="list-style-type: none"> <li>NM State Construction Industries Division</li> </ul>
ORDINANCES	<ul style="list-style-type: none"> <li>Floodplain Management Ordinance</li> </ul>	<ul style="list-style-type: none"> <li>Lincoln County Floodplain Manager</li> </ul>
PLANS, MANUALS, and/or GUIDELINES	<ul style="list-style-type: none"> <li>Comprehensive Master Plan</li> </ul>	<ul style="list-style-type: none"> <li>Mayor</li> </ul>
* Legal and regulatory capabilities for the Village of Corona can be expanded by developing a Communication Plan.		

<b>Table 6-2-6: Technical staff and personnel capabilities for Village of Corona</b>		
<b>Staff/Personnel Resources</b>	<input checked="" type="checkbox"/>	<b>Department/Agency - Position</b>
Planner(s) or engineer(s) with knowledge of land development and land management practices		Contract personnel
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure		Contract personnel
Planner(s) or engineer(s) with an understanding of natural and/or human-caused hazards		Contract personnel
Floodplain Manager	<input checked="" type="checkbox"/>	Managed by Lincoln County Floodplain Manager
Surveyors		Contract personnel
Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	Fire Chief
Personnel skilled in GIS and/or HAZUS		Contract personnel
Scientists familiar with the hazards of the community		Contract personnel
Emergency manager	<input checked="" type="checkbox"/>	Fire Chief
Grant writer(s)		Contract personnel
Others		
* Technical staff and personnel capabilities for the Village of Corona can be expanded by hiring a Building Code Enforcement Officer, and village engineer.		

<b>Table 6-3-6: Fiscal capabilities for Village of Corona</b>		
<b>Financial Resources</b>	<b>Accessible or Eligible to Use (Yes, No, Don't Know)</b>	<b>Comments</b>
Community Development Block Grants	Yes	
Capital Improvements Project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric service	No	
Impact fees for homebuyers or new developments/homes	No	
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	
Other	Yes	
* Fiscal capabilities for the Village of Corona can be expanded by State and Federal grants, and low interest loans.		

6.2.2 *National Flood Insurance Program Participation*

Participation in the NFIP is a key element of any community's local floodplain management and flood mitigation strategy. Lincoln County and all incorporated jurisdictions participate in the NFIP at varying levels, except for the Village of Corona. Joining the NFIP requires the adoption of a floodplain management ordinance that requires jurisdictions to follow established minimum standards set forth by FEMA and the State of New Mexico when developing in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by the 100-year flood, and that new floodplain development will not aggravate existing flood problems or increase damage to other properties.

Lincoln County, Village of Ruidoso, and the City of Ruidoso Downs have adopted standards that are more stringent than the federal minimum to ensure better flood mitigation practices. As a participant in the NFIP, communities also benefit from having Flood Insurance Rate Maps (FIRM) that map identified flood hazard areas and can be used to assess flood hazard risk, regulate construction practices and set flood insurance rates. FIRMs are also an important source of information to educate residents, government officials and the private sector about the likelihood of flooding in their community.

Table 6-7 on the following page summarizes the NFIP status and statistics for each of the jurisdictions participating in this Plan. It is noted that Lincoln County, City of Ruidoso Downs, Capitan, and Carrizozo do not have repetitive loss structures as defined by the NFIP, and Corona is not a NFIP participating jurisdiction. The Village of Ruidoso has one repetitive loss structure that is residential and is currently outside the mapped special flood hazard area.

**Table 6-7: NFIP status and statistics for Lincoln County and participating jurisdictions**

<b>Jurisdiction</b>	<b>Community ID</b>	<b>NFIP Entry Date</b>	<b>Current Effective Map Date</b>	<b>Number of Policies</b>	<b>Amount of Coverage</b>	<b>Floodplain Management</b>
Lincoln County	350122	6/2004	11/16/2011	89	\$20,330,400	Provides floodplain management for the Unincorporated County with a CFM
Village of Ruidoso	350098	6/7/1974	11/5/2014	211	\$40,341,100	Floodplain management provided by the Village of Ruidoso CFM
Ruidoso Downs	350034	5/31/1974	11/5/2014	6	\$1,399,500	Floodplain management provided by the City of Ruidoso Downs CFM
Carrizozo	350110	6/2/2010	11/16/2011	1	\$74,800	Floodplain management provided by MOU with Lincoln County
Capitan	350098	11/19/2008	11/16/2011	2	\$128,600	Floodplain management provided by MOU with Lincoln County
Corona	350099	N/A	11/16/2011	0	0	NOT A PARTICIPATING NFIP COMMUNITY

**Lincoln County, City of Ruidoso Downs, Capitan, and Carrizozo do not have repetitive loss structures. The Village of Ruidoso has one repetitive loss structure that is residential and is currently outside the mapped special flood hazard area.**

Each of the participating jurisdictions performed an overall assessment of their participation in the NFIP program by responding to the following questions:

**Question 1:** Describe your jurisdiction's current floodplain management / regulation process for construction of new or substantially improved development within your jurisdiction.

**Question 2:** Describe the status and/or validity of the current floodplain hazard mapping for your jurisdiction.

**Question 3:** Describe any community assistance activities (e.g. – help with obtaining Elevation Certificates, flood hazard identification assistance, flood insurance acquisition guidance, public involvement activities, etc.)

**Question 4:** Describe identified needs in your floodplain management program. This could include things like updating the floodplain management code/regulation, establishing written review procedures, modifying or adding flood hazard area mapping, etc.

Responses were provided by all jurisdictions regardless of their participation status in the NFIP program. Table 6-8 below summarizes the responses provided by each of the currently participating jurisdictions.

**Table 6-8: NFIP program assessment for Lincoln County and participating jurisdictions**

Jurisdiction	Responses to Questions 1-4	
Lincoln County, Carrizozo, Capitan (Corona does not participate)	Q1	Any development is regulated by an ordinance approved by the elected officials. Permit forms, certified site plans and engineered footing plans are required to be approved for any development in the floodplain. The floodplain is administered to by a Certified Floodplain Manager (CFM).
	Q2	Flood Insurance Rate Maps (FIRM's) for floodplain do not have enough detailed information, and require the property owner to hire a Surveyor/Engineer to give the correct Base Flood Elevations (BFE) and delineate the floodplain in all zones.
	Q3	Community assistance includes issuance of flood information letters, information on flood insurance along with hazard identification services.
	Q4	Needs include complete FIRM's for all locations
Ruidoso Downs	Q1	The City of Ruidoso Downs follows a pre development review process that determines if a proposed development will be affected by the FEMA floodplain. The City follows chapter 154 (Flood Hazard Regulations) of the land use ordinance to mitigate potential flood hazards in all areas of development. All building and manufactured home placement are regulated and signed off by the Floodplain Administrator prior to the work being started.
	Q2	The City of Ruidoso Downs adopted the recently revised and approved FEMA flood maps that were effective on November 5, 2014.

**Table 6-8: NFIP program assessment for Lincoln County and participating jurisdictions**

	Q3	The City of Ruidoso Downs through the Planning Department provides assistance with obtaining elevation certificates and flood determinations where possible. We also educate and inform property owners of insurance opportunities and provide written information in the form of a library of handouts and pamphlets. We also have an informational bulletin board and web site information for the citizens to use.
	Q4	The City of Ruidoso Downs will probably look at increasing our freeboard requirement to one foot above base flood elevation as an added safety measure in our development requirements.
Village of Ruidoso	Q1	Properties that seek permits are checked for flood zone. All properties in an AE or A (Villages only flood hazard zones), are than required to fill out a Floodplain application to determine extent of construction. Construction of additions or of new or substantially improved development is required by ordinance to provide an Elevation Certification for project. Than using this, the project is to comply with FEMA requirements for compliance for new work and the existing as may be required.
	Q2	FEMA floodplain maps last updated 11-4-15 See Ruidoso Municipal code
	Q3	We will provide a FIRMette upon request for properties to show property is in or out of a flood hazard zones
	Q4	Clear and accurate flood map for flood zones. FEMA maps not good for most projects, and the county GIS map lot lines are not accurate and so the FEMA overlay for GIS is not correct.

### 6.3 Mitigation Actions/Projects and Implementation Strategy

Mitigation actions/projects (A/P) are those activities identified by a jurisdiction that, when implemented, will have the effect of reducing the community's exposure and risk to the particular hazard or hazards being mitigated. The implementation strategy addresses the "how, when, and by whom?" questions related to implementing an identified A/P.

The update process for defining the new list of mitigation A/Ps for the Plan was accomplished in three steps. First, an assessment of the actions and projects of the 2012 Plan was performed. Second, a new list of A/Ps for the Plan was developed by combining the carry forward results from the assessment with new A/Ps. Third, an implementation strategy for the combined list of A/Ps was formulated. Details of each step and the results of the process are summarized in the following sections.

#### 6.3.1 Previous Mitigation Actions/Projects Assessment

The MPT reviewed and assessed the previous actions and projects listed in Table 6-9 of the 2012 Plan. The assessment included evaluating and classifying each of the previously identified A/Ps based on the following criteria:

<b>STATUS</b>		<b>DISPOSITION</b>	
Classification	Explanation Requirement:	Classification	Explanation Requirement:
<b>"No Action"</b>	Reason for no progress	<b>"Keep"</b>	None required
<b>"In Progress"</b>	What progress has been made	<b>"Revise"</b>	Revised components
<b>"Complete"</b>	Date of completion and final cost of project (if applicable)	<b>"Delete"</b>	Reason(s) for exclusion.

6.3.2 Evaluation Methodology used by previous MPT

In order to evaluate potential actions, the previous MPT used the STAPLEE criteria, outlined in FEMA's *Developing the Mitigation Plan*, which provides a systematic approach to weighing the pros and cons of potential mitigation actions. STAPLEE stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental. Each of these criteria consist of several factors that was considered in the previous 2012 HMP when evaluating the appropriateness of each potential action. STAPLEE was not used by the MPT for the Update.

**Table 6-9: Previous mitigation actions/projects and implementation strategy for Lincoln County**

Mitigation					Implementation			
STAPLEE Score/ Priority Ranking	Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s)	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
42/1	Leverage hazard mitigation funding to improve processes. County Emergency Services Director should increase awareness of hazard mitigation funding opportunities and leverage where possible to benefit response preparedness improvements.	Wildfire, Flood, Drought, Dam Failure, Severe Weather, Tornados, Earthquake, Hazardous Materials, Terrorism, Active Shooter, Communicable Disease	Both	Staff Time	None	Completed	County Emergency Services, County Response Agencies	County and State Budgets, grants, and FEMA
<b>Status/Disposition:</b> The PSA /thinning grant-Completed								
42/2	Low water crossing and bridge improvements. Review and eliminate low water crossings based on prioritization that is driven from emergency response impediment. Scope and eliminate repetitive washout for bridges and improvements that can be made to these areas.	Flood, Severe Weather	Both	Staff Time	None	Completed	Municipal, County and State highway/roads departments, County and Municipal emergency management, potentially sovereign nations, other stakeholders (such as emergency services and USFS).	County and State Budgets, grants, and FEMA grants
<b>Status/Disposition:</b> The low water crossings have been reviewed but there has not been any action to eliminate the crossings. Completed								

**Table 6-9: Previous mitigation actions/projects and implementation strategy for Lincoln County**

Mitigation					Implementation			
STAPLEE Score/ Priority Ranking	Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s)	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
42/3	Repetitive loss roads and highway improvement. Review, scope and improve roads that pass through or along flood prone areas.	Flood, Severe Weather	Both	Staff Time	None	Completed	Municipal, County and State highway/roads departments, County and Municipal emergency management, potentially sovereign nations, other stakeholders (such as emergency services and USFS).	County and State Budgets, grants, and FEMA grants
<b>Status/Disposition:</b> King Industries and the Lincoln County Road department have reviewed and scoped the county roads that have repetitive losses during events. Completed								
37/4	Ensure that routine planned maintenance occurs on right-of-ways. The MPG can meet with Power New Mexico (PNM) to strengthen tree management planning. Together, they can review and update plans and decide on a routine schedule for maintaining rights-of-way.	Severe Weather, Wildfire	Both	Staff Time	Program is reviewed yearly and is ongoing	Completed	MPG, local emergency manager, PNM, other stakeholders (BLM, sovereign tribal nations, etc.).	County budget, participating organization al budgets
<b>Status/Disposition:</b> County Emergency Manager, Joe Kenmore, has met with both power companies on numerous occasions to discuss and establish a schedule to maintain the utility right of ways. Right-of-ways are continually being maintained and trees are either removed or trimmed. Completed								
39/5	Explore how hazardous material transportation routing impacts public safety within communities.  Explore nature of hazardous materials transported through the County and determine if special HazMat route designation is applicable.	Hazardous Materials	Both	Staff Time	Program is reviewed yearly and is ongoing	Completed	MPG, local emergency manager, PNM, other stakeholders (BLM, sovereign tribal nations, etc.).	County budget, participating organization al budgets
<b>Status/Disposition:</b> County staff have inquired with the BNSF railroad and the NM State Police to see if they will notify the county on times that hazardous materials are being transported through the county. The county now does have contacts within the railroad and the NM State Police to ask when there may be HazMat being transported. Completed								



**Table 6-9: Previous mitigation actions/projects and implementation strategy for Lincoln County**

Mitigation					Implementation			
STAPLEE Score/ Priority Ranking	Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s)	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
42/6	Develop alternative public service announcements ahead of time to bring to wildfire public outreach. Such announcements can be made via television and radio, pamphlets, training sessions, and demonstrated activities. Special populations such as non-English speaking populations and the homebound can be identified for specific messages. Topics covered could include personal property mitigation and evacuation procedures.	Wildfire	Both	Staff Time	Program is reviewed yearly and is ongoing	Completed	MPT members, local emergency manager, media outlets	County and State Budgets, grants, and FEMA grants
<b>Status/Disposition:</b> Laura Doth provide information. Completed								
40/7	Notification systems and siren improvement. Improvement of alerting systems that recognizes the remoteness / clustering of population will only improve response to calls to evacuate in the face of hazards, saving lives, and increasing lead time for population to safeguard property.	Earthquake, Dam Failure, Severe Weather, Flood, Tornadoes	Both	Staff Time	Program is reviewed yearly and is ongoing	Completed	County Emergency Services Director	County and State Budgets, grants, and FEMA
<b>Status/Disposition:</b> The "Code Red" system is in place and had a few features added in the last 4 years. Email and text notifications have been added. Completed								
41/8	Initiate (re-establish) contact with Mescalero tribal government to determine who is the new emergency management coordinator, possibly utilizing responder to responder relationships (which are maintained) to improve emergency management to emergency management coordination. Seek out opportunities for emergency management of Lincoln and Otero Counties to participate jointly in planning with Mescalero emergency management.	Wildfire, Flood, Drought, Dam Failure, Severe Weather, Tornadoes, Earthquake, Hazardous Materials, Terrorism, Active Shooter, Communicable Disease	Both	Staff Time	Flight/noise patterns are reviewed with each new development	Completed	County Emergency Services Director, Otero County Emergency Manager, Mescalero Nation Emergency Manager, emergency response organizations, State and Federal agencies	County, State, and Tribal budgets, State grants, and Federal grants
<b>Status/Disposition:</b> The Lincoln County Emergency Manager has met with the Mescalero Fire Chief on numerous occasions to discuss response to emergencies (fire) and coordination of response. Completed								

**Table 6-9: Previous mitigation actions/projects and implementation strategy for Lincoln County**

Mitigation					Implementation			
STAPLEE Score/ Priority Ranking	Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s)	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
43/9	Improve the warning system for Grindstone Dam. Grindstone Dam is subject to overtopping and flooding areas downriver. The current warning system should be upgraded.	Dam Failure, Flood	Both	Time and Materials (mainly county Employees and Voluntary Members of the LEPC) but Possibly a local or state Contractor to conduct studies and develop a plan for	Flight/noise patterns are reviewed with each new development	Completed	County and Local Transportation Agencies, State Transportation Agency, Local Emergency Manager, Other County and local agencies and personnel, and Local Emergency Planning Committee	County and State budgets, State grants, FEMA grants, DOT grants
<b>Status/Disposition:</b> No action has been completed. The Village of Ruidoso may have completed some actions on this project. Completed								
40/10	Hazardous materials technician capacity development. Continue development of tactical capacity for HazMat response with development of technicians with skills necessary.	Hazardous Materials	Both	Staff Time	None	Completed	MPT, County Emergency Services Director, other levels of government (particularly the Village of Ruidoso and its Water Depart, but also Federal, state, and local), sovereign nations within the County	Village, county and state budgets, State grants, and FEMA grants.
<b>Status/Disposition:</b> HazMat awareness and operations training for 8 county employees. County staff will continue to receive HazMat training in order to become more proficient and dealing with HazMat spills and events. Completed								
40/11	Establishing better working relationships between the County and Village of Ruidoso relative to the Grindstone Dam. By increasing mitigation efforts in conjunction with other levels of government and sovereign nations, some of the damages that arise from Grindstone Dam failure or overtopping can be reduced, therefore, reducing the level of impact received by the County.	Flood, Severe Weather, Dam Failure, Earthquake	Both	Staff Time	None	Completed	MPT, County Emergency Services Director, other levels of government (particularly the Village of Ruidoso and its Water Depart, but also Federal, state, and local), sovereign nations within the County	Village, county and state budgets, State grants, and FEMA grants.
<b>Status/Disposition:</b> The County, VOR, Otero County and Mescalero Tribe will continue to make efforts to collaborate on the Dam safety in regards to Mescalero Dam, Grindstone Dam, Bonito Dam, Eagle Lakes Dams and Alto Dam. Currently the County has copies of the EAPs for Lake Mescalero Dam, and Eagle Creek # 1 Dam. Completed								

**Table 6-9: Previous mitigation actions/projects and implementation strategy for Lincoln County**

Mitigation					Implementation			
STAPLEE Score/ Priority Ranking	Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s)	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
40/12	Water rescue capacity development/improvement. Develop capacity among local emergency responders for a water rescue team.	Flood	Both	Staff Time	None	Completed	County Emergency Services Director, County and City Fire Departments, other agencies with applicable resources (boats, etc.)	County and State budgets, State grants, and FEMA grants.
<b>Status/Disposition:</b> The County has created a “Swift Water Rescue team” and the team has received basic water rescue training. Completed								
42/13	Response process optimization. County response personnel all need to use the same methods to respond effectively to a disaster. Cross train County personnel for various response roles/responsibilities, initiate resource deployment planning, and conduct a needs and capability assessment for response processes.	Wildfire, Flood, Drought, Dam Failure, Severe Weather, Tornadoes, Earthquake, Hazardous Materials, Terrorism, Active Shooter, Communicable Disease	Both	Staff Time	None	Completed	Local emergency manager, LEPC members, and other county emergency response agencies.	County and State Budgets, grants, and FEMA grants
<b>Status/Disposition:</b> Ongoing cross training for all types of hazards continues with local, county and state teams. Completed								
42/14	Research funding opportunities for a vulnerability assessment to assist mitigation planning in the county.	Wildfire, Flood, Drought, Dam Failure, Severe Weather, Tornadoes, Earthquake, Hazardous Materials, Terrorism, Active Shooter, Communicable Disease	Both	Staff Time	None	Completed	County Emergency Services Director, others as funding is identified to act as support personnel.	County and State Budgets, grants, and FEMA grants
<b>Status/Disposition:</b> Ongoing research for funding opportunities continues by the county staff. This HMP update includes a vulnerability assessment. Completed								
42/15	Increase level of effort and proactively utilize county right to object in issuance of building permits by the state. : The county administration can work with the commission to formulate an approach and expense management of a more proactive review process as part of the state’s building permit system for unincorporated parts of the county.	Wildfire, Flood, Drought, Dam Failure, Severe Weather, Tornadoes, Earthquake, Hazardous Materials, Terrorism, Active Shooter, Communicable Disease	Both	Staff Time	None	Completed	Local emergency manager, LEPC members, and other county emergency response agencies.	Local planning grants, and State funds
<b>Status/Disposition:</b> No progress on building codes however the County Flood manager requires a review of flood plain involvement prior to a permit being issued. Completed								

**Table 6-9: Previous mitigation actions/projects and implementation strategy for Lincoln County**

Mitigation					Implementation			
STAPLEE Score/ Priority Ranking	Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s)	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
38/15	Clearing and widening of Rio Ruidoso between the confluence of Grindstone Canyon Creek and Rio Ruidoso (inside the Village of Ruidoso) and through to the Village of Ruidoso Downs corporate limits, a distance of approximately 15 miles. This area includes the confluence of intermittent streams of Gavilan Canyon, Cedar Creek and Cherokee Bill Canyon.	Flood, Dam Failure	Both	Pre-grant: \$5 to 10K. Project: \$250K - \$1M, depending on final length of river to be addressed and considerations for sustainable rehabilitation design.	None	Completed	County and community public works department, state and federal agencies (forestry and natural resources stakeholders)Village of Ruidoso staff	Grant Application: county or community government. Scoping of project may be a grant funded activity that can be supported by a contractor. Project planning and procurement.
<b>Status/Disposition:</b> The stretch of river between Grindstone creek and the City of Ruidoso Downs. Ruidoso Downs placed Jersey barriers to mitigate excessive runoff and improved bar ditches and culverts. Completed								
47/15	Rerouting of a section of water and/or sewer lines in the Village of Ruidoso. Project description under development by the Village of Ruidoso however it involves removal of water and/or sewer lines from a crossing point of Rio Ruidoso to a route under Sudderth Avenue	Flood	Both	Pre-grant: \$5 to 10K for planning/scoping. Project: \$250K - \$1M, depending on whether design involves running lines deeper below Rio Ruidoso or rerouting.	None	Completed	Village of Ruidoso	Grant Application: county or community government. Scoping of project may be a grant funded activity that can be supported by a contractor. Project planning and procurement.
<b>Status/Disposition:</b> This project is being aggressed as a recovery project and not considered a mitigation project. Completed								
n/a	Communications – Establish and prioritize needed improvements of key pre-disaster communications systems and critical response equipment. County response personnel all need to use the same equipment to respond effectively to a disaster.	Wildfire, Flood, Drought, Dam Failure, Severe Weather, Tornados, Earthquake, Hazardous Materials, Terrorism, Active Shooter, Communicable Disease		Staff Time		Completed	Local emergency manager, LEPC members, and other county emergency response agencies.	County and State Budgets, grants, and FEMA grants
<b>Status/Disposition:</b> The County has upgraded the dispatch radios and console as well as added two new repeater pairs. Completed								

**Table 6-9: Previous mitigation actions/projects and implementation strategy for Lincoln County**

Mitigation					Implementation			
STAPLEE Score/ Priority Ranking	Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s)	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
n/a	Conduct public meetings to raise awareness of threats and how citizens can mitigate the impact of disasters. This action can include a series of public meetings with local and visiting subject matter experts to educate the public on how to decrease their risk during a given disaster by understanding the hazard in question and the potential devastation it can create. The county can also team with home improvement stores to give classes to educate citizens on measures they can take to protect their own homes against certain disasters.	Wildfire, Flood, Drought, Dam Failure, Severe Weather, Tornados, Earthquake, Hazardous Materials, Terrorism, Active Shooter, Communicable Disease	Both	Staff Time	Program is reviewed yearly and is ongoing	Delete	MPT members, local emergency managers, Local Emergency Planning Committee (LEPC) members, county commissioners, other county agencies, the New Mexico DHSEM, and other state agencies with roles in emergency management.	County and State Budgets, grants, and FEMA
<b>Status/Disposition:</b> This has been revised to be specific to each hazard.								
n/a	Establish and implement a process for activating cooling shelters in high risk communities during heat events. A program will be developed to include a process for identification and assessment of appropriate facilities, adoption of appropriate authorities and/or agreements to use the facilities, and protocols to equip, activate, operate and demobilize facilities that can be used as cooling shelters during an extreme heat event.	Drought		Staff Time		Completed	Local emergency manager, water district	County budget, participating organization al budgets
<b>Status/Disposition:</b> All the County Senior Citizen centers have been scoped and repairs and maintenance done in order to make that all the HVAC systems are adequate and working properly. Completed								
n/a	Develop public service announcements about specific threats for disseminations via the media. These announcements can be developed and kept on file to update and disseminate to the public as warranted. Such announcements can be made via television and radio, pamphlets, training sessions, and demonstrated activities. If the threat is an ongoing risk, the message can be relayed throughout the year to the county. Special populations such as non-English speaking populations and the homebound can be identified for specific messages. Topics covered that relate to many hazards would include evacuation and sheltering-in-place.	Wildfire, Flood, Drought, Dam Failure, Severe Weather, Tornados, Earthquake, Hazardous Materials, Terrorism, Active Shooter, Communicable Disease		Staff Time		Completed	Local emergency manager and media outlets.	County and State Budgets, grants, and FEMA grants

**Table 6-9: Previous mitigation actions/projects and implementation strategy for Lincoln County**

Mitigation					Implementation			
STAPLEE Score/ Priority Ranking	Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s)	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
	<b>Status/Disposition:</b> The County developed, through a contractor, “Ready, Set, Go” Your Personal Wildland Fire Action Guide pamphlet. 2500 copies were made and disseminated to the public. Numerous PSAs have been completed using KEDU radio in Ruidoso. KEDU staff have disseminated the info to other media outlets for broadcasting. Completed							

### 6.3.3 New Mitigation Actions / Projects and Implementation Strategy

The first step in developing new mitigation actions/projects for each participating jurisdiction was to conduct a brainstorming session at the Planning Team Meeting No. 4. Using the goals, results of the vulnerability analysis and capability assessment, and the Planning Team’s institutional knowledge of hazard mitigation needs in the county and jurisdictions, the MPT brainstormed to develop a comprehensive list of potential mitigation A/Ps that address the various hazards identified. Upon completion of the assessment, each jurisdiction met and developed a new list of A/Ps using the goals and objectives, results of the vulnerability analysis and capability assessment, and the planning team’s institutional knowledge of hazard mitigation needs in their community. For each A/P, the following elements were identified:

- **Description** – a brief description of the A/P including a supporting statement that tells the “what” and “why” reason for the A/P.
- **Hazard(s) Mitigated** – a list of the hazard or hazards mitigated by action.
- **Estimated Costs** – concept level cost estimates that may be a dollar amount or estimated staff time.

Once the full list of A/Ps was completed to the satisfaction of the LPT, the team then set to work developing the implementation strategy for those A/Ps. The implementation strategy addresses the “*priority, how, when, and by whom?*” questions related to the execution and completion of an identified A/P. Specific elements identified as part of the implementation strategy included:

- **Priority Ranking** – each A/P was assigned a priority ranking of either “High”, “Medium”, or “Low”. The assignments were subjectively made using a simple process that assessed how well the A/P satisfied the following considerations:
  - A favorable benefit versus cost evaluation, wherein the perceived direct and indirect benefits outweighed the project cost.
  - A direct beneficial impact on the ability to protect life and/or property from natural hazards.
  - A mitigation solution with a long-term effectiveness.
- **Planning Mechanism(s) for Implementation** – where applicable, a list of current planning mechanisms or processes under which the A/P will be implemented. Examples could include CIPs, General Plans, Area Drainage Master Plans, etc.
- **Anticipated Completion Date** – a realistic and general timeframe for completing the A/P. Examples may include a specific target date, a timeframe contingent upon other processes, or recurring timeframes.

- **Primary Agency and Job Title Responsible for Implementation** – this would be the agency, department, office, or other entity and corresponding job title that will have responsibility for the A/P and its implementation.
- **Funding Source** – the source or sources of anticipated funding for the A/P.

Tables 6-10-1 through 6-10-6 summarize the updated mitigation A/P and implementation strategy for each participating Plan jurisdiction.

Table 6-10-1: Mitigation actions/projects and implementation strategy for LINCOLN COUNTY								
Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Agency/ Title Responsible for Implementation	Funding Source(s)
High	Reduce wildfire hazardous fuels by thinning around the following critical facilities within the county: Nogal Fire Station Lincoln Fire Station Capitan Communication Tower	Wildfire	Nogal Fire Lincoln Fire Capitan Communication tower	\$250,000	CWPP	5 years	Lincoln County Office of Emergency Services (LCOES), Manager	County and State Budgets, grants, and FEMA grants
High	Replace the following low water crossings within the county with a more accessible & desirable design, in order for emergency vehicles, road department vehicles, school busses and private vehicles to pass through these areas during high water events: Skeen road Salazar Road Snell Road Bancroft Road Fair Grounds Crossing  State Hwy 368, 4 low water crossings. This is a state Hwy therefore the NMDOT will be the primary agency	Flood	Alamo Canyon Skeen Road Salazar Road Snell Road Bancroft Road Lincoln County Fair Grounds crossing  State Hwy 368	\$5 million	Critical Infrastructure Plan (CIP) Emergency Operations Plan (EOP)	5 years	Lincoln County Road Department manager  NM Department of Transportation (NMDOT), District Engineer	County and State Budgets, grants, and FEMA grants  State Budgets and FEMA Grant



**Table 6-10-1: Mitigation actions/projects and implementation strategy for LINCOLN COUNTY**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Agency/ Title Responsible for Implementation	Funding Source(s)
High	Improve the following roads that are repetitively damaged during flood events; in order for emergency vehicles, road department vehicles, school busses and private vehicles to pass through these areas during high water events as well as after the event subsides: Bogle Road Patos Road Jicarilla Road Bonito lake Road Nogal Road Blackwater draw road Devils Canyon	Flood	Bogle Road Patos Road Jicarilla Road Bonito Lake Road Nogal Road Blackwater draw road Devils Canyon road	\$10 million	Critical Infrastructure Plan (CIP) Emergency Operations Plan (EOP)	5 years	Lincoln County Road Department manager	County and State Budgets, grants, and FEMA grants
High	Reduce Hazardous fuel loads in the West Gavilan area to mitigate wildfire events of the Alto residential areas.	Wildfire	Alto residential Subdivisions, Alto and Ruidoso drinking water infrastructure	\$1 million	CWPP	5 years	Lincoln County Office of Emergency Services (LCOES) manager	County budget, State and FEMA Grants
High	Install snow fence along Hwy 246 to mitigate snowdrifts on the road during severe winter storms.	Severe Winter Storms	Highway 246	\$50,000	Comprehensive Plan (CP) Master Road Plan (MRP)	3 years	Lincoln County Road Department, manager	County budget, State and FEMA Grants
Medium	Conduct public outreach to raise awareness of threats from drought and how citizens can mitigate the impact of drought. This action can include a series of public meetings with local and visiting subject matter experts to educate the public on drought and its impacts on water availability, fire danger, flora and fauna impacts, wildlife impacts and how citizens can cope with these impacts.	Drought	Residential areas	\$2000	EOP CMP	5 years	Lincoln County Office of Emergency Services (LCOES) manager	County budget, State and FEMA Grants
Medium	Clear the debris out of the Rio Bonito channel between the Bonito Lake Dam east to Hwy 48. In order to allow water to flow downstream without obstruction during thunderstorms. To make sure that the debris does not stack up at the Hwy 48 bridge and wash it out.	Thunderstorm	Hwy 48 Bridge, Private property	\$500,000	EOP	5 years	Lincoln County Office of Emergency Services manager	County and State Budgets, grants, and FEMA grants

**Table 6-10-1: Mitigation actions/projects and implementation strategy for LINCOLN COUNTY**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Agency/ Title Responsible for Implementation	Funding Source(s)
Medium	Conduct public outreach awareness on the impacts of Dam Failure and how to mitigate private property and move personal property out of the way of the oncoming flood waters due to dam failure.	Dam Failure	Residential homes and private property	\$2000	EOP	5 years	Lincoln County Office of Emergency Services manager	County and State Budgets, grants, and FEMA
Medium	Develop an all Lincoln County multi-jurisdictional communications plan. This plan will be lead by Lincoln County OES manager.	Wildfire, Severe Winter Storm, Thunderstorm, Flood, Drought, Dam Failure	Communication	\$50K	CP, EOP	5 years	Lincoln County Office of Emergency Services manager	County and State Budgets, grants, and FEMA
Medium	Conduct public outreach to raise awareness of threats and how to mitigate from thunderstorms including how citizens can prepare for the impact of these events.	Thunderstorm	Residential homes, citizens	\$1000	EOP CP	5 years	Lincoln County Office of Emergency Services Manager	County and State budgets, State grants, FEMA grants
Low	Create a county ordinance that requires people within the flood plain below the Bonita dam to remove debris within the area where the high water will flow.	Dam Failure	Private property, Critical communication facilities	\$1000	Ordinance	5 years	Lincoln County Office of Emergency Services, Manager, County Commission	County budget
Low	Add additional insulation to the Bonita Fire Department, Sonterra Station to mitigate severe winter storms.	Severe Winter Storm	Bonita Fire Department Sonterra Station	\$25,000	CP, CIP	5 years	Lincoln County Office of Emergency Services, Manager	County and State budgets, State grants, FEMA grants
Low	Create and adopt a drinking water conservation plan for the water systems within the county and citizens with private wells. Consumers and citizens can mitigate the effects of drought by conserving water.	Drought	Water	\$5000	EOP Water Master Plan (WMP)	5 years	Lincoln County Office of Emergency Services, Manager, County Commission	County and State Budget
Low	Harden the Emergency Services Communication Antennas against lightning at the Emergency Operations Center.	Thunderstorms	Communication	\$200,000	EOP CP	5 years	Lincoln County Office of Emergency Services, Manager, County Commission	County and State Budget

**Table 6-10-2: Mitigation actions/projects and implementation strategy for VILLAGE OF RUIDOSO**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
High	Buffer zone improvement. Create a thinned buffer zone around the Grindstone Lake area bordering Mescalero Reservation	Wildfire	Village Assets, Critical facilities within the Village of Ruidoso	\$400,000	Emergency Operations plan (EOP), Community Master plan (CMP) Community Infrastructure Plan (CIP)	5 years	Village of Ruidoso Fire Chief	Village and State Budgets, grants USFS and FEMA grants
High	Hazardous fuels reduction for the Wood Lane area bordering the village limits (All other areas bordering the Village Ruidoso; create thinned buffer zone)	Wildfire	Village Assets, Critical facilities within the Village	\$400,000	EOP, CMP, CIP	5 years	Village of Ruidoso Fire Chief	Village and State Budgets, grants USFS and FEMA grants
High	Harden the Emergency Services Communication Antennas against lightning.	Thunderstorms	Emergency Service communication tower	\$200,000	CMP EOP CIP	2 years	Village of Ruidoso Emergency Services,	Village and State Budgets, grants and FEMA grants
High	Increase the capacity of culverts and drainage near Rio Ruidoso near Mid-town and the eastern half of Sudderth Dr. (continuing to Hwy 70)	Flood	Roads, streets, infrastructure, private property	\$3.1 M	CMP EOP CIP	5 years	Village of Ruidoso Public Works Department, Director	Village and State Budgets, grants and FEMA grants
High	Increase City's water storage capacity by adding a new water storage tank.	Drought	Water	\$3.1	CMP EOP CIP	3 years	Village of Ruidoso Public Works Department, Director	Village and State Budgets, grants and FEMA grants
High	Conduct public outreach awareness on the impacts of Dam Failure and how to mitigate private property against dam failure and move personal property out of the way of the oncoming floodwaters due to dam failure.	Dam Failure	Private property, residences	\$2500	CMP EOP CIP	2 years	Village of Ruidoso Public Works Department, Director	Village and State Budgets, grants and FEMA grants
Medium	Improve Rio Ruidoso capacity. Conduct a Preliminary Engineering Report (PER) on the Rio Ruidoso capacity to determine how to improve the capacity. This report will alleviate data deficiencies for missing information Once PER is complete a mitigation strategy will be added to this plan.	Flood	City critical facilities, citizens and private property	\$2.5	CMP EOP CIP	2 years	Village of Ruidoso Public Works Department, Director	Village and State Budgets, grants and FEMA grants
Medium	Move the Main Rd. Upper Canyon, above ground power lines to underground powerlines.	Wildfire	Power lines, citizens and private property	\$1.5	CMP EOP CIP	5 years	Village of Ruidoso Public Works Department, Director	Village and State Budgets, grants and FEMA grants, Utility company budget

**Table 6-10-2: Mitigation actions/projects and implementation strategy for VILLAGE OF RUIDOSO**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
Medium	Hazardous fuels reduction around critical facilities: PNM power substation on Gavilan, around water tanks, around Sewer Treatment plants, around Fire Stations 1, 2, & 3, Ruidoso Fire Sub Stations (Close Rd & Cree Meadows Dr.) and the Ruidoso Police Station, and around Village Hall.	Wildfire	Village Assets, Critical facilities within the Village of Ruidoso	\$500,000	CMP, EOP, CIP	5 years	Village of Ruidoso emergency services, manager	Village and State Budgets, grants and FEMA grants
Medium	Conduct public outreach and awareness on the early warning system and the effects of severe weather. Inform citizens on how to mitigate their homes and property against thunderstorms.	Thunderstorms	Citizens	\$300,000	EOP	3 years	Village of Ruidoso emergency services, manager	Village and State Budgets, grants and FEMA grants
Low	Create a Village ordinance that requires people within the flood plain below the Grindstone and Mescalero dam to remove debris and personal property within the area where the high water will flow. By removing debris and personal property from the river channel will reduce the amount of debris and items that will plug bridges and culverts.	Dam Failure	Bridges, roads, infrastructure	\$1500	CMP EOP CIP	5 years	Village of Ruidoso emergency services, manager	Village and State Budgets, grants and FEMA grants
Low	Conduct public outreach to raise awareness of threats from drought and how citizens can mitigate the impact of drought. This action can include a series of public meetings with local and visiting subject matter experts to educate the public on drought and its impacts on water availability, fire danger, flora and fauna impacts, wildlife impacts and how citizens can cope with these impacts.	Drought	Public Drinking Water	\$2000	CMP EOP CIP	5 years	Village of Ruidoso emergency services, manager	Village and State Budgets, grants and FEMA grants

**Table 6-10-3: Mitigation actions/projects and implementation strategy for CITY OF RUIDOSO DOWNS**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
High	Buffer zone improvement. Create a thinned buffer zone around the Turkey Canyon area bordering the city limits	Wildfire	City Assets, Critical facilities within the City	\$250,000	Emergency Operations plan (EOP), Community Master plan (CMP) Community Infrastructure Plan (CIP)	5 years	Ruidoso Downs Fire Chief	City and State Budgets, grants USFS and FEMA grants
High	Hazardous fuels reduction for the Wood Lane area bordering the city limits	Wildfire	City Assets, Critical facilities within the City	\$250,000	EOP, CMP, CIP	5 years	Ruidoso Downs Fire Chief	City and State Budgets, grants USFS and FEMA grants
High	Early Warning Improvement. Improved early warning will give the community and its residents the opportunity to take protective measures to move personal property, vehicles and people out of harm's way. Add two new hazard sirens.	Thunderstorms Dam Failures	Citizens	\$75,000	EOP CMP CIP	3 years	Ruidoso Downs Emergency Services, Manager	City and State Budgets, grants, and FEMA grants
High	Harden the Emergency Services Communication Antenna against lightning.	Thunderstorms	Emergency Service communication tower	\$100,000	CMP EOP CIP	2 years	Ruidoso Downs Emergency Services, Manager	City and State Budgets, grants and FEMA grants
High	Increase the capacity of culverts and drainage ditches in the Ruidoso Gardens subdivision.	Flood	Staff Time, Equipment, Materials, Contractors	\$1.25 M	CMP EOP CIP	5 years	Ruidoso Downs Public Works Department, Director	City and State Budgets, grants and FEMA grants
High	1) Increase City's water storage capacity by adding a new water storage tank.	Drought	Water	\$500k	CMP EOP CIP	3 years	Ruidoso Downs Public Works Department, Director	City and State Budgets, grants and FEMA grants
Medium	Improve Rio Ruidoso capacity. Conduct a Preliminary Engineering Report (PER) on the Rio Ruidoso capacity to determine how to improve the capacity. This report will alleviate data deficiencies for missing information Once PER is complete a mitigation strategy will be added to this plan.	Flood	City critical facilities, citizens and private property	\$60,000	CMP EOP CIP	2 years	Ruidoso Downs Public Works Department, Director	City and State Budgets, grants and FEMA grants
Medium	Repetitive loss roads and highway improvement. Review scope and improve roads that pass through or along flood prone areas to reduce flood impacts.	Flood	City critical facilities, citizens and private property	\$1.0M	CMP EOP CIP	5 years	Ruidoso Downs Public Works Department, Director	City and State Budgets, grants and FEMA grants

**Table 6-10-3: Mitigation actions/projects and implementation strategy for CITY OF RUIDOSO DOWNS**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
Medium	Conduct public outreach to raise awareness of threats from drought and how citizens can mitigate the impact of drought. This action can include a series of public meetings with local and visiting subject matter experts to educate the public on drought and its impacts on water availability, fire danger, flora and fauna impacts, wildlife impacts and how citizens can cope with these impacts.	Drought	Water	\$1000	CMP, EOP, CIP	5 years	Ruidoso Downs emergency services, manager	City and State Budgets, grants and FEMA grants
Medium	Conduct public outreach and awareness on the early warning system and the effects of thunderstorms and dam failures. Inform citizens on how to mitigate their homes and property against thunderstorms and dam failures.	Thunderstorms Dam Failures	Citizens	\$2000	EOP	5 years	Ruidoso Downs emergency services, manager	City and State Budgets, grants and FEMA grants

**Table 6-10-4: Mitigation actions/projects and implementation strategy for TOWN OF CARRIZOZO**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
High	Improve and replace existing water lines and fire hydrants as well as add another 50% additional fire hydrants. 'Improve' means relocate and improve materials to result in greater water supply. The Town currently has less than 50% of the required fire hydrants and many of the existing hydrants are not in working order. The community does not have enough water capacity or fire hydrants to protect the community against a wildfire.	Wildfire	All Community assets	\$1,500,000	Emergency Operations Plan, Asset Management Plan (AMP)	5 years	Town of Carrizozo, Mayor Rick Hyatt	Town budget and NMED grants and loans, USDA and FEMA grants
High	Install a 500,000-gallon storage tank to increase water storage capacity to supply water for fire protection. Valle Del Sol is East of town center but surrounded by rural lands that are subject to wildfire. There is not adequate water supply in the area to support fire protection.	Wildfire	Valle Del Sol subdivision	\$500,000	AMP, Emergency Operations Plan (EOP)	5 years	Town of Carrizozo, Mayor Rick Hyatt	Town budget and State grants and loans, USDA and FEMA grants
Medium	Preliminary Engineering Report (PER) for flash flooding for the town including Valle Del Sol. The town needs engineering to help develop a plan/project to mitigate flash flooding through the Valle del Sol subdivision and town. Many streets and home are subject to flooding during these high water events. This report will alleviate data deficiencies for missing information Once PER is complete a mitigation strategy will be added to this plan.	Thunderstorm	Town assets, residential homes, streets, roads, infrastructure	\$60,000	AMP, EOP	5 years	Town of Carrizozo, Mayor Rick Hyatt	NM Finance Authority Planning Grant



**Table 6-10-4: Mitigation actions/projects and implementation strategy for TOWN OF CARRIZOZO**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
Medium	Improve the siren that sits on top of the library/police station. The town has an old antiquated emergency siren system that needs to be improved. It has been historically used to notify citizens of a natural disaster imminent.	Thunderstorm	Town residents, infrastructure and assets	\$100,000	EOP, AMP	5 years	Town of Carrizozo, Mayor Rick Hyatt	Town budget and State grants and loans, USDA and FEMA grants
Medium	Drill a drinking water well and connect it into the current water system to ensure redundancy during drought periods as well as provide adequate water for fire protection. Due to the old age of the existing wells it is feared that the Town will run short on water.	Drought	Citizens	\$500,000	EOP AMP	5 years	Town of Carrizozo, Mayor Rick Hyatt	Town budget and State grants and loans, USDA and FEMA grants
Medium	Drill East & West drinking water wells deeper to improve capacity of each well. The wells lost 50% of water production. Deeper drilling will result in providing additional water.	Drought	Citizens	\$500,000	AMP	5 years	Town of Carrizozo, Mayor Rick Hyatt	Town budget and State grants and loans, USDA and FEMA grants
Medium	Purchase 2 portable backup generators to power water/wastewater/solid waste/ evacuation shelters/ government services infrastructure.	Wildfire Severe Winter Weather	Supply of water, sewer, shelter and government services to citizens.	\$150,000	EOP	1 year	Town of Carrizozo, Mayor Rick Hyatt	Town budget and State grants and loans, USDA and FEMA grants
Medium	Establish a warming center. Purchase blankets and emergency supplies to supply emergency shelters during severe weather events when travelers on Hwy 54 and Hwy 380 are stranded in Carrizozo. At least once annually Carrizozo is inundated with a winter storm causing travelers to be stranded in Carrizozo. All the churches and school is used as shelters. They do not have the resources to purchase supplies. Citizens pitch in to help.	Severe Winter Weather	Travelers	50,000	EOP	1 year	Town of Carrizozo, Mayor Rick Hyatt	Town budget and State grants and loans, and FEMA grants and Red Cross

**Table 6-10-4: Mitigation actions/projects and implementation strategy for TOWN OF CARRIZOZO**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
High	Install a communications tower and communications building on a location to be determined. The town does not currently have a means to communicate with emergency responders during routine daily activities nor during emergency events.	Severe Winter Weather.	Communication	\$500,000	Communications plan (CP)	5 years	Town of Carrizozo, Mayor Rick Hyatt	Town budget and State grants and loans, USDA and FEMA grants

**Table 6-10-5: Mitigation actions/projects and implementation strategy for VILLAGE OF CAPITAN**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
High	Develop a defensive space plan for the community. This plan will include an ordinance for property owners to clear debris and maintain a defensible space around their residences. This plan will be to mitigate wildfire.	Wildfire	Village assets, critical facilities, residences, infrastructure	\$1000	Ordinance	1 year	Village of Capitan Council, Mayor Dennis Haskell	Village budget
High	Purchase 3 backup generators to power water/wastewater infrastructure. To be used on water wells, booster pumps and waste water treatment plant during power outages caused by severe winter storms.	Severe winter storm	Supply of water and sewer to citizens.	\$150,000	Critical Infrastructure Plan (CIP) Emergency Operations Plan (EOP)	2 years	Village of Capitan Public Works, Public works director	Village budget and State grants and loans, and FEMA grants
High	Conduct a Preliminary Engineering Report (PER) for flash flooding for the village including the subdivision. The Village needs engineering study to help develop a plan to mitigate flash flooding. Flash flooding occurs during thunderstorm rain events. This report will alleviate data deficiencies for missing information. Once PER is complete a mitigation strategy will be added to this plan.	Thunderstorm	Village assets, critical facilities, residences, streets, roads, infrastructure	\$60,000	CIP, EOP	5 years	Village of Capitan Public Works, Public works director	NM Finance Authority Planning Grant, State and FEMA grant

**Table 6-10-5: Mitigation actions/projects and implementation strategy for VILLAGE OF CAPITAN**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
Medium	Hazardous fuel reduction on National Forest on the West side of town approximately 1000 acres. Pinon Juniper landscape on rolling hills and some steep canyons.	Wildfire	Residential subdivision area	\$150,000	EOP, CIP, CWPP	5 years	Smokey Bear Ranger District/District Ranger/ in cooperation with the Village of Capitan Public	Village budget and State grants and loans, and FEMA grants
Medium	Conduct Public outreach & awareness regarding drought. Create brochures to include information on water saving techniques and devices. This action will help residents mitigate drought and conserve water.	Drought	Drinking Water	\$1000	CIP	3 years	Village of Capitan Public Works, Director	Village budget and State grants and loans, and FEMA grants
High	Retrofit the roof/windows or rebuild the Capitan Elementary Schools with more resilient materials to meet higher code standards. The current elementary schools flood and leak during thunderstorms.	Thunderstorm	Capitan Schools	\$12M	CIP	5 years	Capitan Schools, Superintendent	State grants and loans, and FEMA grants, local bond issue
Low	Add or replace Landscaping in all public areas with xeriscape.	Drought	Drinking water line	\$5,000	CIP	5 years	Village of Capitan Public Works, Director	Village budget and State grants and loans, and FEMA grants
Low	Conduct Public outreach & awareness to the public regarding severe winter storms. Create brochures to include information on how to mitigate against a severe winter storm, what to expect and how to be prepared with enough water, food, batteries, flashlights and a possible backup generator.	Severe Winter Storm	Citizens	\$1000	EOP	4 years	Village of Capitan Public Works, Director	Village budget and State grants and loans, and FEMA grants
Low	Install additional insulation in the ceiling of the Village Hall to mitigate a Severe Winter Storm and ensure that government services continue.	Severe Winter Storm	Village Hall	\$20,000	Village Master Plan (VMP)	5 years	Village of Capitan, Mayor	Village budget and State grants and loans, and FEMA grants

**Table 6-10-6: Mitigation actions/projects and implementation strategy for VILLAGE OF CORONA**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
High	Hazard fuels reduction on the south and west corridors approximately 80 acres. Defensible space prescription as per NM State Forestry prescription.	Wildfire	All Community assets	\$1,000,000	CWPP	5 years	Village of Corona, Mayor	Village budget, State grants, Soil and Water Conservation district grants, USDA and FEMA grants
High	Purchase 2 portable backup generators to power water/wastewater/solid waste/ evacuation shelters/ government services infrastructure during a severe winter storm.	Severe Winter storms Wildfire	Supply of water, sewer, shelter and government services to citizens.	\$150,000	Critical Infrastructure Plan (CIP) Emergency Operations Plan (EOP)	2 years	Village of Corona, Mayor	Village budget, State grants and loans, and FEMA grants
Medium	Replace the 6 fire hydrants that do not work properly. These fire hydrants are necessary to provide fire protection	Wildfire	All critical facilities and residents	\$150,000	CIP	3 years	Village of Corona, Fire Chief	Village budget, State grants and loans, and FEMA grants
Medium	Conduct a public awareness outreach program by creating brochures on how to be prepared for a winter storm and how to mitigate their home and household against severe winter storms.	Severe Winter Storms	Public residences	\$1000	EOP	5 years	Village of Corona, Mayor	Village budget, State grants, & FEMA grants
Medium	Add or replace landscaping in all public areas with xeriscape.	Drought	Water infrastructure	\$0	CIP	4 years	Village of Corona, Mayor	Village budget

**Table 6-10-6: Mitigation actions/projects and implementation strategy for VILLAGE OF CORONA**

Mitigation					Implementation			
Priority Ranking	Action/Project Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Planning Mechanism(s) for Implementation	Anticipated Duration	Primary Agency/ Job Title Responsible for Implementation	Funding Source(s)
Medium	Conduct a public outreach program by creating brochures informing residents how they can save water and mitigate against drought. The brochures will include water saving techniques and devices.	Drought	Water	\$1000	CIP	5 years	Village of Corona, Mayor	Village budget, State grants, FEMA grants
Low	Install snow fence around the perimeter of Red Cloud water wells #7 & #8 to keep access open, during a severe winter storm in order to allow crews to access the wells for maintenance, repairs and temporary backup power.	Severe winter storm	Water wells Red Cloud #7 & #8	\$2000	CIP	1 year	Village of Corona, Fire Chief	Village budget, State grants, FEMA grants

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## SECTION 7: PLAN MAINTENANCE PROCEDURES

**§201.6(c)(4):** *[The plan shall include...] (4) A **plan maintenance process** that includes:*

- (i) A section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.*
- (ii) A process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.*
- (iii) Discussion on how the community will continue public participation in the plan maintenance process.*

**§201.6(d)(3):** *Plans must be reviewed, revised if appropriate, and resubmitted for approval within five years in order to continue to be eligible for HMGP project grant funding.*

According to the DMA 2000 requirements, each plan must define and document processes or mechanisms for maintaining and updating the hazard mitigation plan within the established five-year planning cycle. Elements of this plan maintenance section include:

- **Monitoring and Evaluating the Plan**
- **Updating the Plan**
- **Continued Public Participation**

The following sections provide a description of the past plan maintenance procedures and activities, and documents the proposed procedures and schedule for the next planning cycle.

### 7.1 Monitoring and Evaluation

#### 7.1.1 Past Plan Cycle

Lincoln County recognized that the hazard mitigation plan is intended to be a “living” document with regularly scheduled monitoring, evaluation, and updating. Section 6 of the 2012 Plan outlined a schedule of specific activities for annual evaluations of the 2012 Plan.

The Emergency Services Director is responsible for contacting MPT members and organizing meetings and will monitor progress on the mitigation action items. Monitoring is important for future eligibility for any mitigation funding that may be available. FEMA and the New Mexico DHSEM have the authority to evaluate the progress of existing mitigation plans to determine if the plan is fulfilling program requirements.

Review of the status of mitigation action items will be conducted by the Emergency Services Director annually in coordination with the Lincoln County Local Emergency Planning Committee. Review will include assessing the status of any completed or ongoing mitigation projects and setting project and funding priorities for the coming year. Results of this review will be reported to the Lincoln County Board of Commissioners.

A poll of the MPT regarding the past execution of the plan maintenance strategy was taken and the following tasks were accomplished by the Emergency Services Director in coordination with the Lincoln County Local Emergency Planning Committee:



- Review of ongoing mitigation projects.
- Setting new projects and funding priorities.

Reasons for the lack of review included:

- Staff turnover and lack of continuity to original planning team.
- Lack of communicating plan maintenance responsibilities to successors during staff changes.
- Lack of major disasters that prompted a review of the 2012 Plan.

#### 7.1.2 *Proposed Schedule and Scope*

Having a multi-jurisdictional plan can aid in the plan monitoring and evaluation through the consolidation of information for all participating jurisdictions into one document. The MPT reviewed the current DMA 2000 rules and the FEMA guidance document and discussed a strategy for performing the required monitoring and evaluation of the Plan over the next 5-year cycle. The MPT has established the following monitoring and evaluation procedures:

- **Schedule** – The Plan shall be reviewed on at least an annual basis. MPT Committee Chairperson will be the Fire Chief for Village of Ruidoso who will take the lead to send out an email invite request for the annual HMP meeting in December 2018 to the following jurisdictions:
  - Lincoln County - Emergency Services Director
  - City of Ruidoso Downs - Planning Services Director
  - Town of Carrizozo - Mayor
  - Village of Capitan - Public Works Director
  - Village of Corona - Mayor
- **Review Content** – Within the email request distributed by MPT Committee Chairperson, each of the jurisdictions will be requested to provide responses to the attached worksheets which will cover the following areas:
  - **Plan Update Evaluation Worksheet (see Appendix F)**
    - *Planning Process*
    - *Capability Assessment*
    - *Risk Assessment*
    - *Mitigation Strategy*
    - *Plan Maintenance Procedures*
  - **Mitigation Action Progress Report Worksheet (see Appendix F)**
    - *Summary of Project Progress for this Report Period*
  - **Goals and Objectives:** *Are the goals and objectives still able to address current and expected conditions?*
- **Documentation** – Each jurisdiction will review and evaluate the Plan as it relates to their community and document responses to the above questions in the worksheets that will be provided. If a MPT member is unable to attend the annual HMP Update Meeting,

then responses to the worksheets will be sent via email. MPT Committee Chairperson will archive all responses in a digital format and store with the Plan for incorporation during the next Plan update. Any hard copies will be included in Appendix F.

A formal presentation of the review material will be presented to a jurisdiction's council or board only if a major update to the Plan is proposed prior to the next five year update.

## **7.2 Plan Update**

According to DMA 2000, the Plan requires updating and re-approval from FEMA every five years. The plan update will adhere to that set schedule using the following procedure:

- ✓ One year prior to the plan expiration date, the MPT will re-convene to review and assess the materials accumulated in Appendix D.
- ✓ The MPT will update and/or revise the appropriate or affected portions of the plan and produce a revised plan document.
- ✓ The revised plan document will be presented before the respective councils and boards for an official concurrence/adoption of the changes.
- ✓ The revised plan will be submitted to DHSEM and FEMA for review, comment and approval.

## **7.3 Continued Public Involvement**

Lincoln County and participating jurisdictions are committed to keeping the public informed about hazard mitigation planning efforts, actions and projects. Although the MPT represents the public to some extent during its review of the plan, the public will be able to comment directly on and provide feedback about the plan during the review period. Public meetings will be held during each jurisdiction's monthly council meeting. This meeting will provide a forum wherein the public can express concerns, opinions, or ideas about the plan. In addition, all jurisdictions will post a link on their own community's website that will directly link to the HMP Update information found on the Village of Ruidoso's website, providing the public with complete updated HMP information and a forum for comments and concerns.

Copies of the plan will be catalogued and kept on hand at all jurisdictional public libraries, jurisdictional city halls, and County courthouse. The existence and location of these copies will be publicized on each jurisdiction's website. The review and any changes that are made during the review will also be publicized on each jurisdiction's website.

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## SECTION 8: PLAN TOOLS

### 8.1 Acronyms

A/P.....	Mitigation Action/Project
BLM .....	Bureau of Land Management
CFR .....	Code of Federal Regulations
CIP .....	Capital Improvement Program
CMP .....	County Master Plan
CP .....	Communication Plan
CRS .....	Community Rating System
CWPP .....	Community Wildfire Protection Plan
DFIRM .....	Digital Flood Insurance Rate Map
DHSEM .....	New Mexico Department of Homeland Security and Emergency Management
DMA 2000 .....	Disaster Mitigation Act of 2000
EOP .....	Emergency Operation Plan
EPA .....	Environmental Protection Agency
FEMA .....	Federal Emergency Management Agency
FIRM .....	Flood Insurance Rate Map
FMA .....	Flood Mitigation Assistance Grant Program
GIS .....	Geographic Information System
HAZMAT .....	Hazardous Material
HAZUS-MH .....	Hazards United States Multi-Hazard
HMGP.....	Hazard Mitigation Grant Program
IFCI .....	International Fire Code Institute
MPG .....	Mitigation Planning Group
MPT .....	Mitigation Planning Team
NCA .....	National Climate Assessment
NCDC .....	National Climate Data Center
NDMC .....	National Drought Mitigation Center
NFIP .....	National Flood Insurance Program
NFPA .....	National Fire Protection Association
NOAA .....	National Oceanic and Atmospheric Administration
NWS .....	National Weather Service
PPOC .....	Primary Points of Contact
RL .....	Repetitive Loss
USDA .....	United States Department of Agriculture
USFS .....	United States Forest Service
USGS .....	United States Geological Survey
VA .....	Vulnerability Analysis
VOR .....	Village of Ruidoso

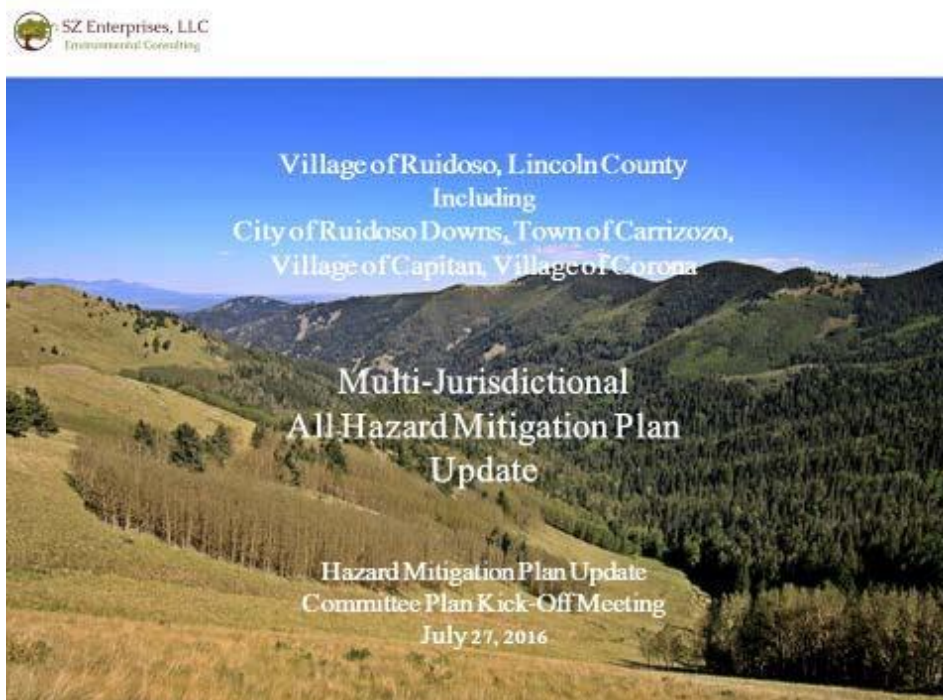
**APPENDIX A**

Official Resolution of Adoption

## **APPENDIX B**

### Planning Process Documentation

LINCOLN COUNTY KICKOFF PRESENTATION







- I. INTRODUCTIONS AND WELCOME
- II. PURPOSE, NEED, AND EXPECTATIONS
- III. PARTICIPATION STRATEGY
- IV. PLAN REVIEW
- V. CONCLUSION



- Attendance
- Introductions
- Hazard Mitigation Plan Update Committee
  - Committee Chair Person



I. INTRODUCTIONS AND WELCOME

II. PURPOSE, NEED, AND EXPECTATIONS

III. PARTICIPATION STRATEGY

IV. PLAN REVIEW

V. CONCLUSION



What is Hazard Mitigation Planning?

Planning for any sustained action(s) taken  
to reduce or eliminate the long-term risk  
to human life and property from hazards

Mitigation=Prevention



- **Hazard**—a source of **potential** danger
- **Vulnerability**—Degree of **exposure** or susceptibility to damage of an asset
- **Vulnerability Assessment**—The extent of damage that may result from a hazard event of a given intensity (50, 100 yr. flood; Cat. 1, 2, ...5 hurricane)
- **Risk**—The **estimated impact** that a hazard would have on people, services, facilities, and structures—quantifiable
- **Risk Assessment**—Process of measuring the potential loss of life, personal injury, economic injury, and property damage



- **Why “plan”?**
  - Establish vision and mission
  - Establish common goals
  - Incorporate the “big picture”
  - Bring many stakeholders together
  - Establish community connectivity... coordination and communications
  - Look at resource allocation (time, money, etc.)
  - Ensure ability to implement, monitor, evaluate, and modify



Purpose, Need, and Expectations:  
Why **Update** Hazard Mitigation Plan?

**Why Update?**

- Eligibility for mitigation grant project funding
- Any changes in hazard identification
- Vulnerability analyses
- Local mitigation capabilities
- Progress made during the past five years to prevent or reduce future losses from natural hazards



Purpose, Need, and Expectations:  
**Origins**

- **Present: Disaster Mitigation Act of 2000 (DMA 2000)**
  - -Reinforces importance of mitigation planning before hazards occur... " to reduce the nation's disaster losses ..." (FEMA Interim Final Rule)
  - -Establishes a pre-disaster hazard mitigation program
  - -Creates new requirements for national post-disaster Hazard Mitigation Grant Program (HMGP)
  - -Requires states and communities to have an approved mitigation plan in place prior to receiving post-disaster HMGP funds
  - Requires a five year revision in order to achieve eligibility for the Federal Emergency Management Agency (FEMA), Flood Mitigation Assistance, Pre-Disaster Mitigation, and Hazard Mitigation Grant Processes.

# Lincoln County Multi-Jurisdictional Hazard Mitigation Plan 2018



Purpose, Need, and Expectations:  
Expectations



List of Tasks

- Planning Process
- Risk Assessment
- Mitigation Strategy
- Plan Maintenance
- Additional State Requirements
- Plan Hazard Mitigation Adoption and Approval
- Hazard Mitigation Plan Deliverables

<b>TASK 1</b> Determine the Planning Area and Resources	<b>TASK 4</b> Review Community Capabilities	<b>TASK 9</b> Create a Safe and Resilient Community
<b>TASK 2</b> Build the Planning Team	<b>TASK 5</b> Conduct a Risk Assessment	
<b>TASK 3</b> Create an Outreach Strategy	<b>TASK 6</b> Develop a Mitigation Strategy	
	<b>TASK 7</b> Keep the Plan Current	
	<b>TASK 8</b> Review and Adopt the Plan	

**Planning Process (Initial Steps)**

- 1. Confirm Plan Purpose**  
- develop mission statement
- 2. Review Current Mitigation Plan**
- 3. Refine Plan Scope and Schedule**
- 4. Establish Responsibilities**
- 5. Develop an Outreach Strategy**

- I. INTRODUCTIONS AND WELCOME
- II. PURPOSE, NEED, AND EXPECTATIONS
- III. PARTICIPATION STRATEGY
- IV. PLAN REVIEW
- V. CONCLUSION

**Participating Agencies:**

**Partners Involved in Hazard  
Mitigation Activities**

- Building Code Enforcement
- Emergency Management
- Fire Department/Districts
- Floodplain Administration
- Geographic Information Systems (GIS)
- Parks and Recreation
- Planning/Community Development
- Public Information Office
- Public Works
- Stormwater Management
- Transportation (Roads/Bridges)
- State Emergency Management Office
- Regional Planning Agency

**Partners with Authority to  
Regulate Development**

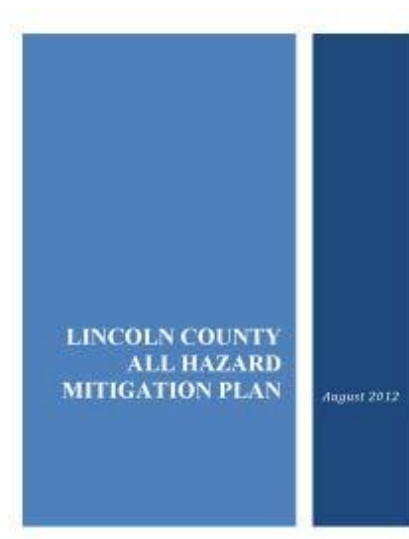
- City Council/Board of Commissioners
- Planning Commission
- Planning/Community Development
- Regional/Metropolitan Planning
- Special Districts

- **Committee Structure**
  1. Expand/Contract
  2. Steering Committee
  3. Meeting Location/Frequency?
- **Developing a Plan for Public Relations & Education**
- **Concerns, Comments, Questions**
- **Other Issues?**





- I. INTRODUCTIONS AND WELCOME
- II. PURPOSE, NEED, AND EXPECTATIONS
- III. PARTICIPATION STRATEGY
- IV. PLAN REVIEW
- V. CONCLUSION



**REVIEW AND UPDATE:**

▪ **THE PLANNING PROCESS**

- Public comment
- Involvement in the planning process
- Incorporate appropriate existing plans

▪ **PLAN CONTENT**

- Documentation of the planning process
- Risk assessment
  - Type, location, extent of all natural hazards that affect the jurisdiction
  - Jurisdiction vulnerability to the hazards, summary of each hazard and its impact on the community
    - Describe vulnerability of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas
    - Estimate of potential dollar losses

**REVIEW AND UPDATE:**

▪ **HAZARD MITIGATION STRATEGIES**

- Goals
- Specific mitigation actions and projects
- Action plan with prioritization

▪ **PLAN MAINTENANCE PROCEDURES**

- Method and schedule of monitoring, evaluating, and updating the mitigation plan
- Process by which local government can incorporate the requirements of the mitigation plan into other planning mechanisms (comprehensive or capital improvement plans) when appropriate
- Discussion of how community will continue public participation and plan maintenance

▪ **HANDOUT**

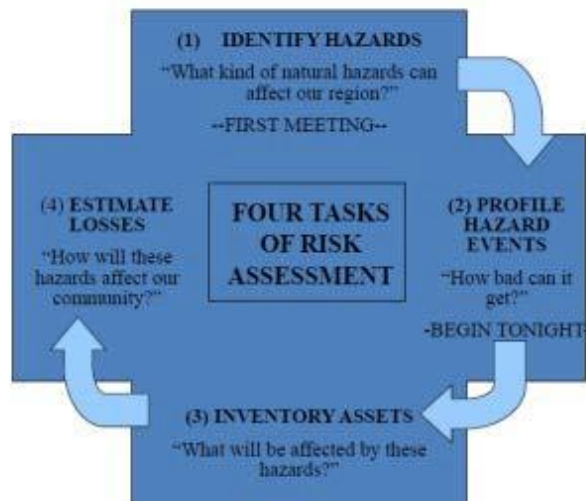
- The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements.
  - As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS:
  - Reduce flood damage to insurable property;
  - Strengthen and support the insurance aspects of the NFIP, and
  - Encourage a comprehensive approach to floodplain management.

<http://www.fema.gov/national-flood-insurance-program-community-rating-system>

**Mitigation Goals**

- Reduce or eliminate hazardous conditions that cause loss of life or inflict injury
- Reduce or eliminate hazardous conditions that cause property damage
- Reduce or eliminate hazardous conditions that degrade important natural resources
- Reduce or eliminate hazardous conditions that impact the community's recovery time in emergency response.

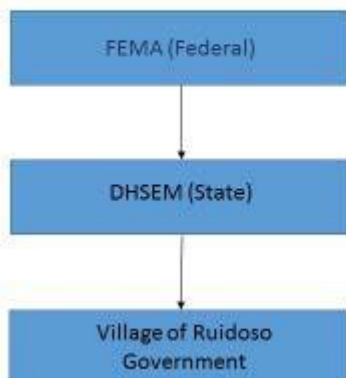
- **CRITICAL FACILITIES**
  - HOSPITALS
  - SCHOOLS
  - POLICE STATIONS
  - FIRE STATIONS
  - POWERPLANTS
  - SEWER
  - POTABLE WATER
  - EMERGENCY OPERATIONS CENTER



# Lincoln County Multi-Jurisdictional Hazard Mitigation Plan 2018



## Funding Process



## Risk Assessment: Identify Hazards

- Simply identify what hazards might affect the community
- Narrow the list to hazards that are most likely to impact
- Keep records of information gathered

News papers and other unofficial accounts

Federal and state data base info

Community Expert and Municipal data

**Worksheet #1 Identify the Hazards** step 1

Date: \_\_\_\_\_ What kinds of natural hazards can affect you?

**Task A. List the hazards that may occur.**

1. Research newspapers and other historical records.
2. Review meeting plans and reports.
3. Talk to the experts in your community, state, or region.
4. Gather information on historical threats.
5. Visit or the Internet for history you or others think is the best. It lists threats of hazards that may occur in your community or state.

**Task B. Focus on the most prevalent hazards in your community or state.**

1. Go to hazard threats.
2. Answer your community or state on the Website map.
3. Determine whether you are in a high-risk area. Get more detailed information if necessary.
4. Also in the Internet for history you or others think is the best. It lists threats of hazards that may occur in your community or state.

Task A	Task B	Hazard or Event Description (Type of hazard, date of event, number of injuries, cost and type of damage, etc.)	Source of Information	Map Analysis for this hazard?	Scale of Map
<input type="checkbox"/> Avalanche	<input type="checkbox"/>				
<input type="checkbox"/> Coastal Erosion	<input type="checkbox"/>				
<input type="checkbox"/> Coastal Storms	<input type="checkbox"/>				
<input type="checkbox"/> Dam Failure	<input type="checkbox"/>				
<input type="checkbox"/> Drought	<input type="checkbox"/>				
<input type="checkbox"/> Earthquake	<input type="checkbox"/>				
<input type="checkbox"/> Explosive Rocks	<input type="checkbox"/>				
<input type="checkbox"/> Extreme Heat	<input type="checkbox"/>				
<input type="checkbox"/> Flood	<input type="checkbox"/>				
<input type="checkbox"/> Hailstorm	<input type="checkbox"/>				
<input type="checkbox"/> Hurricane	<input type="checkbox"/>				
<input type="checkbox"/> Land Subsidence	<input type="checkbox"/>				
<input type="checkbox"/> Landslide	<input type="checkbox"/>				
<input type="checkbox"/> Heavy Winter Storm	<input type="checkbox"/>				
<input type="checkbox"/> Tornado	<input type="checkbox"/>				
<input type="checkbox"/> Tsunami	<input type="checkbox"/>				
<input type="checkbox"/> Volcano	<input type="checkbox"/>				
<input type="checkbox"/> Wildfire	<input type="checkbox"/>				
<input type="checkbox"/> Windstorm	<input type="checkbox"/>				
<input type="checkbox"/> Other _____	<input type="checkbox"/>				
<input type="checkbox"/> Other _____	<input type="checkbox"/>				
<input type="checkbox"/> Other _____	<input type="checkbox"/>				

Note: Related hazards can be added as they show up.

# Lincoln County Multi-Jurisdictional Hazard Mitigation Plan 2018

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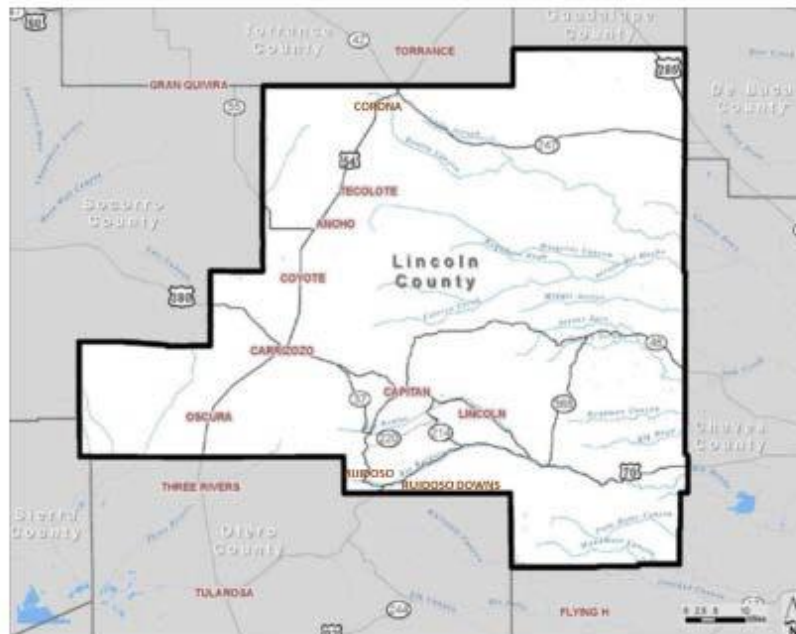


## Risk Assessment: Profile Hazard Events

- Has your department/district suffered losses during past hazard events due to wildfires, flooding or storms that could have been prevented?
- Do you foresee a future scenario where your department/district might be susceptible to losses as a result of a storm event?
- Obtain and create base maps
- Obtain hazard event profile information.
- Record the hazard event profile information.



## Plan Review: Maps





Conclusion

- I. INTRODUCTIONS AND WELCOME
- II. PURPOSE, NEED, AND EXPECTATIONS
- III. PARTICIPATION STRATEGY
- IV. PLAN REVIEW
- V. CONCLUSION



Conclusion

- I. Meeting Summary
  - A. Purpose, Need, and Expectations
  - B. Participation Strategy
  - C. Plan Review
  - D. Conclusion
- II. Tentative Agenda for Meeting 2
  - A. Risk Assessment
  - B. Map Review
  - C. Project Prioritization
- III. Schedule/Locate Next Meeting
- IV. Adjourn



**Lincoln County  
Multi-Jurisdictional Hazard Mitigation Plan  
2018**

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Contact Information

Jack King  
(575) 937-3815  
capitanvaquero@gmail.com

Stephany Zabel  
(970) 239-0770  
stephany@szenvironmental.com

**AGENDA & 1<sup>st</sup> Meeting Notes**  
**FOR**  
**VILLAGE OF RUIDOSO, LINCOLN COUNTY**  
**INCLUDING**  
**CITY OF RUIDOSO DOWNS, TOWN OF CARRIZOZO,**  
**VILLAGE OF CAPITAN, AND VILLAGE OF CORONA**  
**HAZARD MITIGATION PLAN UPDATE**

7/27/2016  
@ 9:00-11:00 A.M

541 Sudderth Street  
Village of Ruidoso Fire Station 1 Ruidoso,  
New Mexico

**ATTENDEES**

SZ Enterprises – Contractor/Facilitator  
Cody Thetford, Interim Fire Chief – Ruidoso Fire Dept.  
Michael Morrow, Captain – Ruidoso Fire Dept.  
Jerry Corliss, Lieutenant – Ruidoso Fire Dept.  
J.P. Kenmore, OES – Lincoln County  
Darren Hooker, Chief – Ruidoso Police Dept.  
Lawrence T. Chavez, Lieutenant – Ruidoso Police Dept.  
Chris Rupp, Chief – Ruidoso Downs Police Dept.

**I. INTRODUCTIONS AND WELCOME**

The Lincoln County Hazard Mitigation Plan Update Committee held their kick-off meeting at the Village of Ruidoso Fire Station 1 meeting room, on Wednesday, June 27, 2016. The purpose of the meeting was to introduce the committee, create the Planning Team, and discuss an overview of the Plan Update process. A slide show was conducted to give a better understanding about the Plan Update process. Prior to the meeting, Lincoln County's current Hazard Mitigation Plan from 2012 was sent via email to all participating jurisdictions.

Introductions were made and Cody Thetford welcomed and thanked everyone for coming and informed them that this is a community effort and he is thankful for the participation of attendees. He and Joe Kenmore stated that everyone has to work together to make this plan successful,

and in order for that to happen, we need everyone to show up and participate.

SZ Enterprises discussed that the company was hired by Village of Ruidoso to update the Hazard Mitigation Plan for 2016. SZ informed the attendees that throughout the planning process we want to make sure that we are incorporating the effort into other planning processes. The updated plan will be a living document that is important to the community, but the planning process is as equally significant. Providing opportunity for the entire community, neighboring communities, and public, to get involved is essential too.

Cody discussed match percentages that is associated with each jurisdiction and that it is everyone's own responsibility to give him the quarterly information. Although it was agreed that it would be easier for everyone to provide this information monthly to Cody.

Everyone was informed that there will be several more committee meetings to come and there will be meeting minutes emailed out along with other information if anyone has any questions or input between meetings. Also, there will be significant data gathered between these meetings.

All attendees agreed that they would be part of the 'Planning Team', and Cody Thetford, Village of Ruidoso Interim Fire Chief, agreed to take the role of Committee Chair Person for the Hazard Mitigation Plan Update. It was also discussed that Town of Carrizozo, Village of Capitan, and Village of Corona need to appoint a representative to participate on the Planning Team as well. Their involvement is important to the overall success of the updated plan.

## **II. PURPOSE, NEED, AND EXPECTATIONS**

Attendees were informed about the grant that Village of Ruidoso has received to update the Lincoln County Hazard Mitigation Plan. The grant is a Pre-Disaster Mitigation Grant (PDM) and it flows from Federal Emergency Management Agency (FEMA) to the New Mexico Department of Homeland Security and Emergency Management (DHSEM) to the Village of Ruidoso.

Hazard Mitigation Planning was explained that it is "Planning for any sustained action(s) taken to reduce or eliminate the long-term risk to human life and property from hazards."

A few definitions that will be used throughout the planning process were discussed such as Hazard, Vulnerability, Vulnerability Assessment, Risk, and Risk Assessment.

The past & present planning standards were discussed and the mitigation plan has to be updated every 5 years for the entire Lincoln County community to remain eligible for Hazard Mitigation Grant Program (HMGP) funds. Again, the committee was informed that this plan should be their plan and the committee's input into this plan is much appreciated.

Lincoln County was approved in 2012 but there are not only new jurisdictions now involved, but new hazards and criteria that need to be incorporated, including how resources can be allocated to expedite the implementation of hazard mitigation projects. Input regarding the project lists that will be sent out between updates is imperative to the planning process.

New data needs to be incorporate into the new plan including vulnerability analyses, any changes in hazard identification, where the committee thinks we should spend extra time on, and progress of projects that has been made in the past 5 years.

The planning process was discussed and phases were described during the PowerPoint slide show. The idea is to stay circling between phase 1, 2, and 3 within the planning process to ensure that there is enough input from the committee for the Hazard Mitigation Plan Update.

### **III. PARTICIPATION STRATEGY**

Participating Agencies and a list of stakeholders from the worksheet was discussed. It was encouraged to the attendees to invite as many people as possible to attend plan update meetings.

Joe Kenmore will reach out to the BLM, SO, Forest Service, and NM State Forestry, to invite them to attend our next meeting.

Public outreach strategy for this update was developed. To maximize the public's involvement it was agreed that each jurisdiction will include the HMP update on their city council/county commission meeting's agenda. These meetings are always open to the public, creating an opportunity for this important public input during the update. All information obtained from these meetings will be brought back to the HMP Committee

meetings for discussion. Cody Thetford will reach out to his PIO, creating a website hub that will disseminate all our HMP update information to the public.

#### **IV. PLAN REVIEW**

The existing plan overview and an overview of what this process holds was discussed as part of the slide show.

Goals and Critical Facilities were discussed and will be updated throughout this plan.

Discussion on the tasks of hazard identification and risk assessment took place, and applicable worksheets were given to go over in the next meeting.

#### **V. QUESTIONS/COMMENTS**

- Cody Thetford will connect with the PIO of the Village of Ruidoso.
- Joe Kenmore will reach out to the BLM, SO, Forest Service, State Forestry.
- Worksheets given to the Planning Team need to be reviewed and filled out with as much information as possible.
- Between meetings, any participation is encouraged
- Next meeting will held again at the Village of Ruidoso Fire Station 1 on **Wednesday, August 3, 2017**, to cover Plan Review, Community Capabilities, Hazard Identification, and Risk Assessment.

#### **VI. CONCLUSION**

#### **VII. ADJOURN**

**AGENDA & 2<sup>nd</sup> Meeting Notes**  
**FOR**  
**VILLAGE OF RUIDOSO, LINCOLN COUNTY**  
**INCLUDING**  
**CITY OF RUIDOSO DOWNS, TOWN OF CARRIZOZO,**  
**VILLAGE OF CAPITAN, AND VILLAGE OF CORONA**  
**HAZARD MITIGATION PLAN UPDATE**

8/3/2016  
@ 9:00 A.M

541 Sudderth Street  
Village of Ruidoso Fire Station 1 Ruidoso, New  
Mexico

**ATTENDEES**

SZ Enterprises – Contractor/Facilitator  
Cody Thetford, Interim Fire Chief – Ruidoso Fire Dept.  
Debi Lee, Village Manager – Village of Ruidoso  
Darrell Chavez, Lieutenant – Ruidoso Downs  
Steve Dunigan, Planning & Zoning – Ruidoso Downs  
Jerry Corliss, Lieutenant – Ruidoso Fire Dept.  
J.P. Kenmore, OES – Lincoln County  
Curt Temple, Planning Director – Lincoln County  
Darren Hooker, Chief – Ruidoso Police Dept.  
Lawrence T. Chavez, Lieutenant – Ruidoso Police Dept.  
Anthony Sanchez, FMO – US Forest Service  
Kenny Ellard, A. Chief – Ruidoso Downs Fire Dept.

- **WELCOME AND INTRODUCTIONS**

The Lincoln County Hazard Mitigation Plan Update Committee held their second meeting at the Village of Ruidoso Fire Station 1, Wednesday, August 3, 2016. The purpose of the meeting was to provide an opportunity to review the old plan, and receive Mitigation Planning Team (MPT) input on additional hazard events that need to be added to the plan.

New attendees were welcomed and introductions were made.

Cody Thetford addressed the new attendees to keep track of their expenses to ensure everyone meets their “match”.

- **SUMMARY OF FIRST MEETING**

The first meeting minutes were summarized and it was discussed that the goal of the Hazard Mitigation Plan Update is for it to be approved by both FEMA and DHSEM so that the Lincoln County community remains eligible for Hazard Mitigation Grant Program funds. It was also reiterated that the plan is a living document and continual participation is essential.

- **REVIEW OF CURRENT ALL HAZARD MITIGATION PLAN**

The current Lincoln County AHMP from 2012 was broadly discussed during a PowerPoint presentation to ensure that the entire MPT not only has reviewed the plan, but has a better understanding of assessing the current plan’s applicability. Most importantly, it started the process of gaining input from the MPT on local conditions, as well as their desires. All the following sections were reviewed: 1) County Profile, 2) Planning Process, 3) Hazard Identification and Risk Analysis, 4) Vulnerability Analysis, 5) Mitigation Strategy, and 6) Plan Maintenance.

The County Profile section will have to be completely updated with all new demographic data from the new added jurisdictions. The main source of information will come from the U.S. Census Bureau.

Review of the current HMP Planning Process finalized the discussion on how the team wants to reach out to the public, neighboring communities, and local and regional agencies also involved in hazard mitigation activities. Regarding the public outreach strategy, Cody Thetford explained how he contacted Kerry Gladden, Public Information Officer of Village of Ruidoso to develop a website hub. Cody showed the MPT the Village of Ruidoso’s website which had a HMP Update link specifically created to keep the public well-informed and allow for comments and questions during the entire HMP Update process. It was decided that all the remaining jurisdictions will post a link on their own websites that will directly link to the HMP Update information found on the Village of Ruidoso’s website. In addition, each jurisdiction will include the HMP Update on their city council/county commission meeting’s agenda to address public concerns and input.

It was also agreed upon to use Lawrence Chavez’s idea to access social media as another way to reach and encourage public involvement. The Facebook page for Village of Ruidoso will be set up by Lawrence Chavez, and the Facebook page for Ruidoso Downs will be set up by Kenny Ellard.



Joe Kenmore discussed how he reached out to the additional municipalities, Town of Carrizozo, Village of Capitan, Village of Corona, as well as the BLM, SO, Forest Service, and State Forestry to participate during the update process.

Discussion over the Hazard Identification and Risk Analysis review covered how historical data will be retrieved from sources such as, the Lincoln County Community Wildfire Protection Plan (CWPP), National Climatic Data Center (NCDC), and the National Flood Insurance Program (NFIP). Curt Temple noted that he can contribute digital flood plain maps for all communities, and that another valuable source of information can be obtained through the Earth Data Analysis Center (EDAC). In addition, we reviewed all of the Hazard Events listed in the current HMP and discussed what Hazard Events have occurred since then.

The Vulnerability Analysis discussion explained the total infrastructure values associated with each of the respective hazard, and how data will be obtained not only from participating jurisdictions, but also from HAZUS.

Mitigation Goals were discussed and explained that they are generic enough to be a “catch all” for any type of hazard mitigation project. Attention to the following current HMP goals was stressed and noted that during the next meeting any changes will be added.

- Reduce or eliminate hazardous conditions that cause loss of life or inflict injury;
- Reduce or eliminate hazardous conditions that cause property damage;
- Reduce or eliminate hazardous conditions that degrade important natural resources; and
- Reduce or eliminate hazardous conditions that impact the community’s recovery time in emergency response.

The MPT started the discussion to incorporate an additional goal that would address communications, improving the entire community’s communications during a disaster through a consolidated dispatch.

The Plan Maintenance review discussion covered how it was previously reviewed, and highlighted that the HMP is a living document that needs to be evaluated every year.

- **HAZARD EVENT PROFILES**

Following the review of the current plan’s hazard event profiles, hazard events that have happened since 2011-present were mentioned which included the 2011 Freeze, 2011 White Fire, and the 2012 Little Bear Fire. Also, new hazards were discussed that could affect each participating jurisdiction. In addition to the current plan’s listed hazards that the MPT reviewed, the MPT would like to see additional hazard event profiles

addressed in the update. The discussion covered man-made hazard events like terrorist attacks, and possible epidemic/pandemic hazards like the Zika Virus.

- **CONCLUSION**

- Next MPT meeting will be Wednesday, August 17, 2016 at 9:00 AM at the Lincoln County Emergency Operation Center, Capitan, NM. The general agenda for the 3<sup>rd</sup> Meeting will be focusing on the following:
  - Review Community Capabilities
  - Hazard Identification
  - Risk Assessment
- The MPT will finish filling out the worksheets that covers Capability Assessment and Hazard Summary for their own jurisdiction.

- **ADJOURN**

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**AGENDA & 3<sup>rd</sup> Meeting Notes**  
**FOR**  
**VILLAGE OF RUIDOSO, LINCOLN COUNTY**  
**INCLUDING**  
**CITY OF RUIDOSO DOWNS, TOWN OF CARRIZOZO,**  
**VILLAGE OF CAPITAN, AND VILLAGE OF CORONA**  
**HAZARD MITIGATION PLAN UPDATE**

8/17/2016  
@ 9:00 A.M

111 Copper Ridge Road  
Lincoln County Emergency Operation Center  
Capitan, New Mexico

**ATTENDEES**

SZ Enterprises – Contractor/Facilitator  
Cody Thetford, Interim Fire Chief – Ruidoso Fire Dept.  
Michael Morrow, Captain – Ruidoso Fire Dept.  
Samantha Mendez, Interim Planning Director – Lincoln County  
Rick Hall – Lincoln County  
Yovanne Lucero, Mayor – Town of Carrizozo  
Leann Weihbrecht, Clerk – Town of Carrizozo  
Steve Dunigan, Planning & Zoning – Ruidoso Downs  
Jerry Corliss, Lieutenant – Ruidoso Fire Dept.  
J.P. Kenmore, OES – Lincoln County  
Curt Temple, Planning Director – Lincoln County  
Darren Hooker, Chief – Ruidoso Police Dept.  
Lawrence T. Chavez, Lieutenant – Ruidoso Police Dept.  
David Cox, Public Works – Village of Capitan  
Kenny Ellard, A. Chief – Ruidoso Downs Fire Dept.

- **WELCOME AND INTRODUCTIONS**

The Lincoln County Hazard Mitigation Plan Update Committee held their third meeting at the Lincoln County Emergency Operation Center, Wednesday, August 17, 2016. The purpose of the meeting was to update community capabilities and assets, and receive Mitigation Planning Team (MPT) input on prioritizing hazards.

New attendees were welcomed and introductions were made.

- **SUMMARY OF SECOND MEETING**

The second meeting minutes were summarized, reflecting the MTP review of the current HMP, risk assessment process, and hazard event profiles. It was also reiterated for the new attending jurisdictions, Village of Capitan and Town of Carrizozo, that the plan is a living document and continual participation is essential.

- **UPDATE COMMUNITY CAPABILITIES**

During the prior meeting, community capabilities worksheets were delivered and the information needed from them was discussed. It was explained that local mitigation capabilities are existing authorities, polices, programs, and resources that reduce hazard impacts or that could be used to implement hazard mitigation activities.

The participating jurisdictions were asked about the most recent updates on their community's additional plans such as, Emergency Operations Plan (EOP), Community Wildfire Protection Plan (CWPP), Comprehensive Plan, and Wildland Urban Interface (WUI). Information from these sources will be implemented into the updated HMP.

- **HAZARD EVENT PROFILES**

The current event profiles were discussed. The 2012 Lincoln County HMP identified the following hazards as having the most significant potential impact, listed below in the order the team deemed most significant:

- |                         |                         |
|-------------------------|-------------------------|
| 1. Wildfire             | 9. Earthquake           |
| 2. High Wind            | 10. Tornadoes           |
| 3. Flood                | 11. Hazardous Materials |
| 4. Drought              | 12. Extreme Heat        |
| 5. Thunderstorms        |                         |
| 6. Severe Winter Storms |                         |
| 8. Dam Failure          |                         |

The following hazards have been identified as additional hazards that the MPT would like to include in their new plan.

1. Terrorism
2. Communicable Disease Outbreak
3. Active Shooter

It was noted that FEMA only requires the MPT to address “natural” hazards, but the MPT can address any additional hazards outside of “natural”. It is the community’s plan and anything the MPT deems important can be implemented into the update.

- **RISK ASSESSMENT**

To assist the MPT with prioritizing hazards for their community, the Priority Risk Index (PRI) spreadsheet calculator was displayed. Several hazards were inputted into the spreadsheet to exam how the PRI is calculated.

For Carrizozo, hazardous materials being transported by the railroad has potential to turn into a disastrous event, so this example was inputted into the PRI and calculated a number of 3. Each jurisdiction will take all their identified hazards and calculate the PRI before the next meeting.

The community asset worksheet was reviewed, going over structures, infrastructures, critical facilities, and future developments. These assets then are broken down to determine location, number, structural integrity, and unique vulnerability. Critical facilities was noted as the following:

1. **Communications Infrastructure:** Telephone, data services, and internet communications, cell and radio towers, which have become essential to continuity of business, industry, government, and military operations.
2. **Electrical Power Systems:** Generation stations and transmission and distribution networks that create and supply electricity to end-users.
3. **Gas and Oil Facilities:** Production and holding facilities for natural gas, crude and refined petroleum, and petroleum-derived fuels, as well as the refining and processing facilities for these fuels.
4. **Banking and Finance Institutions:** Banks, financial service companies,

payment systems, investment companies, and securities/commodities exchanges.

5. **Transportation Networks:** Highways, railroads, ports and inland waterways, pipelines, and airports and airways that facilitate the efficient movement of goods and people.
6. **Water Supply Systems:** Sources of water; reservoirs and holding facilities; aqueducts and other transport systems; filtration, cleaning, and treatment systems; pipelines; cooling systems; and other delivery mechanisms that provide for domestic and industrial applications, including systems for dealing with water runoff, wastewater, and firefighting.
7. **Government Services:** Capabilities at the federal, state, and local levels of government required to meet the needs for essential services to the public.
8. **Emergency Services:** Medical, police, fire, and rescue systems.

Also, other assets such as public libraries, schools, recreational facilities, historic buildings or sites, and churches, were also considered “critical” per the MPT.

- **CONCLUSION**

- Next MPT meeting will be Wednesday, August 24, 2016 at 9:00 AM at the Lincoln County Emergency Operation Center, Capitan, NM. The general agenda for the 4th Meeting will be focusing on the following:
  - Review Community Capabilities
  - Hazard Identification
  - Risk Assessment
- The MPT will finish filling out the Priority Risk Index (PRI) and the Community Asset worksheets for their own jurisdiction.

- **ADJOURN**

- **ADDENDUM MEETING**

SZ Enterprises met with Cody Thetford, Interim Fire Chief for Village of Ruidoso, MPT Committee Chairperson, for an hour reviewing the contractor’s task and deliverables. In addition, SZ Enterprises met with Joe Kenmore, OES for Lincoln County, reviewing HAZUS and SIM Table.

**AGENDA & 4th Meeting Notes**  
**FOR**  
**VILLAGE OF RUIDOSO, LINCOLN COUNTY**  
**INCLUDING**  
**CITY OF RUIDOSO DOWNS, TOWN OF**  
**CARRIZOZO, VILLAGE OF CAPITAN, AND**  
**VILLAGE OF CORONA**  
**HAZARD MITIGATION PLAN UPDATE**

8/24/2016  
@ 9:00 A.M

111 Copper Ridge Road  
Lincoln County Emergency Operation Center  
Capitan, New Mexico

**ATTENDEES**

SZ Enterprises – Contractor/Facilitator  
Brad Gage, Fire Chief – Corona  
Steve Barnett, Police Chief – Town of Carrizozo  
Cody Thetford, Interim Fire Chief – Ruidoso Fire Dept.  
Orlando Arriola, Fire Chief – Ruidoso Fire Dept.  
Steve Dunigan, Planning & Zoning – Ruidoso Downs  
J.P. Kenmore, OES – Lincoln County  
Curt Temple, Planning Director – Lincoln County  
Darren Hooker, Chief – Ruidoso Police Dept.  
Lawrence T. Chavez, Lieutenant – Ruidoso Police Dept.  
David Cox, Public Works – Village of Capitan  
Kenny Ellard, A. Chief – Ruidoso Downs Fire Dept.

● **WELCOME AND INTRODUCTIONS**

The Lincoln County Hazard Mitigation Plan Update Committee held their fourth meeting at the Lincoln County Emergency Operation Center, Wednesday, August 24, 2016. The purpose of the meeting was to receive spreadsheets on community assets and hazards prioritized by the priority risk index, evaluate mitigation goals and objectives, and discuss new mitigation projects.

New attendees were welcomed and introductions were made.



- **SUMMARY OF THIRD MEETING**

Minutes were summarized, and the MPT reviewed Community Capabilities, Hazard Event Profiles, Risk Assessment, and Maps. Homework assignments regarding the Community Asset Spreadsheet and the Priority Rate Index spreadsheet were discussed for each jurisdiction.

It was reiterated to the new attendees to be sure to send “match” information to Cody Thetford. Also, the MPT Public Outreach Strategy was again covered to ensure each community will be taking the HMP update information to their governing body. This includes the HMP update along with the Ruidoso weblink to be put on the agenda for each jurisdiction’s city/town meetings, ensuring public participation and awareness.

After the third meeting, an additional meeting was held on August 19, 2016 at the Lincoln County EOC to view the county’s Simtable. The details on this meeting was discussed to the MPT. The Lincoln County Simtable provides simulations of hazards pertinent to the region. The digital sandtable has customized agent-based models to the wildland fire, emergency management, as well as defense and urban security. All-hazard scenarios were performed during that meeting to achieve the visual impact to the surrounding communities.

- **COMMUNITY ASSET WORKSHEET REVIEW**

Several jurisdictions who are still working on the spreadsheet had questions on how to segregate the applicable information, like residential structures and critical facilities. It was informed to the MPT that the information could be broken down under subdivisions or under the community as a whole.

Lincoln County addressed acequias to be incorporated into the plan. A separate meeting with Jackie Powell will be set up to gather all the applicable acequia information, including maps.

- **PRIORITY RISK INDEX (PRI) WORKSHEET REVIEW**

Every jurisdiction listed the identified hazards in order of significance for their community using the PRI spreadsheet.

The current event profiles were discussed as having the most significant potential impact, listed below in the order the MPT deemed most significant:

1. Wildfire
2. High Wind
3. Flood
4. Drought
5. Thunderstorms
6. Severe Winter Storms
8. Dam Failure
9. Earthquake
10. Tornadoes
11. Hazardous Materials
12. Extreme Heat

The following hazards have been identified in addition to the Natural hazards that the MPT would like to include in their new plan.

1. Terrorism
2. Communicable Disease Outbreak
3. Active Shooter

- **DETERMINE MITIGATION STRATEGIES**

The MPT reviewed, evaluated, and agreed the current goals will stay in the updated plan.

- ☐ Reduce or eliminate hazardous conditions that cause loss of life or inflict injury;
- ☐ Reduce or eliminate hazardous conditions that cause property damage;
- ☐ Reduce or eliminate hazardous conditions that degrade important natural resources; and
- Reduce or eliminate hazardous conditions that impact the community's recovery time in emergency response.

It is understood that the focus of these goals are to reduce especially repetitive costs associated with disasters to property owners and all levels of government including the protection or retrofit of critical facilities, reducing exposure to liability and minimizing community disruption.

Current Mitigation Strategy Objectives were also address and evaluated. The MPT decided from prior discussions emphasizing unified communications amongst the communities, that Objective 5 will be reworded to include, *and communication*, to the current sentence.

6. *Increasing awareness of hazards and their effects;*
7. *Decreasing the possibility of impact from the most significant threats;*
8. *Decreasing the vulnerability of critical and non-critical facilities;*
9. *Increasing established response mechanisms by enhancing partnerships; and*
10. *Increasing coordination and communication between levels of government regarding incidents and response mechanisms.*

Project List (see attachment: Lincoln County HMP Projects List)

It was explained that projects list is a wish list but also a list that shows suggestions of top priority projects to each jurisdiction. The MPT divided into groups by jurisdiction to address and write down additional projects that they would like to see added to the new plan, then each jurisdiction presented it to the entire group.

Some of the additional projects mentioned by the MPT:

- Emergency Operation Plan (EOP) update
- Low water crossing signage
- A jurisdictional communication center
- Additional forest thinning

## • CONCLUSION

- Next MPT meeting will be Wednesday, September 14, 2016 at 9:00 AM at the Lincoln County Emergency Operation Center, Capitan, NM. The general agenda for the 5th Meeting will be focusing on the following:
  - Mitigation Strategy
  - Review Project List
  - Plan Maintenance
- Several jurisdictions will finish computing the Priority Risk Index (PRI) and the

Community Asset worksheets to email to the facilitator.

- **ADJOURN**

**AGENDA & 5th Meeting Notes**  
**FOR**  
**VILLAGE OF RUIDOSO, LINCOLN COUNTY**  
**INCLUDING**  
**CITY OF RUIDOSO DOWNS, TOWN OF**  
**CARRIZOZO, VILLAGE OF CAPITAN, AND**  
**VILLAGE OF CORONA**  
**HAZARD MITIGATION PLAN UPDATE**

9/14/2016  
@ 9:00 A.M

111 Cooper Ridge Road  
Lincoln County Emergency Operation Center  
Capitan, New Mexico

**ATTENDEES**

SZ Enterprises – Contractor/Facilitator  
Steve Barnett, Police Chief – Town of Carrizozo  
Cody Thetford, Interim Fire Chief – Ruidoso Fire Dept.  
Steve Dunigan, Planning & Zoning – Ruidoso Downs  
J.P. Kenmore, OES – Lincoln County  
Curt Temple, Interim Road Dept. – Lincoln County  
Samantha Mendez, Interim Planning Director, Lincoln County  
Darren Hooker, Chief – Ruidoso Police Dept.  
Lawrence T. Chavez, Lieutenant – Ruidoso Police Dept.  
David Cox, Public Works – Village of Capitan  
James Taylor – Acequia Representative

- **WELCOME AND INTRODUCTIONS**

The Lincoln County Hazard Mitigation Plan Update Committee held their fifth meeting at the Lincoln County Emergency Operation Center, Wednesday, September 14, 2016. The purpose of the meeting was to review project lists, mitigation strategy, plan maintenance, and to discuss acequias.

- **SUMMARY OF FOURTH MEETING**

Minutes from the third meeting was summarized, and the MPT reviewed Community Asset Capabilities and the Priority Risk Index worksheet. Mitigation goals and objectives were reviewed and updated, and each jurisdiction provided its own community project list.

Cody Thetford explained to all jurisdictions that reimbursement for in-kind will only be reimbursed for a third, and going forward Cody will not be collecting in-kind timesheets. If any jurisdiction wants to submit additional in-kind paperwork then they will have to do so through their own finance department. Also, the MPT Public Outreach Strategy was again discussed to obtain an update on everyone's community council meetings, ensuring public awareness/involvement is continuing through the HMP Update process.

□ **REVIEW PROJECT LIST**

During the 4<sup>th</sup> meeting, each jurisdiction broke into groups to discuss the hazard mitigation projects that are specific to their own community. Although, updates to this list were emailed to facilitator from jurisdictions who had input from either governmental organizations, stakeholders, or public. All updates were discussed to the MPT.

□ **ACEQUIAS**

**It was agreed upon by the MPT that the HMP update will feature a new section addressing acequias in Lincoln County. James Taylor, an acequia representative, addressed the MPT on how the acequia information/maps can be acquired. A key source of such information can be obtained through the NM Acequia Association, Paula Garcia and Jackie Powell. Separate meetings will be setup to gather the applicable information.**

□ **MITIGATION STRATEGIES**

Current HMP mitigation measures were discussed and analyzed: general mitigation activities, public awareness, wildfire mitigation steps, improving floodplain management, response process improvement, protection against man-made hazards, and early warning.

Evaluation methodology using the STAPLEE criteria was reviewed. This systematic approach will be used to evaluate all potential actions that were discussed by the MPT.

STAPLEE stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental. Each of these criteria consist of several factors that should be considered when evaluating the appropriateness of each potential action. Each potential mitigation action was assessed by ranking each factor in each of the categories (social, technical, administrative, political, etc.) and by then adding up the total score. Rankings were as follows:

0 = Poor: The mitigation method does not meet basic criteria established under the evaluation category.

- 1 = Fair: The mitigation method meets the basic criteria established under the evaluation category.
- 2 = Good: The mitigation method exceeds the basic criteria established under the evaluation category.
- 3 = Excellent: The mitigation method exceeds the basic established criteria in an innovative or new way.

Implementing mitigation measures and financing mitigation actions were also discussed with the MPT, including implementation timeline and funding sources. The inclusion of any specific action item that will be documented in the updated plan does not commit the communities to implementation. Each item will be considered in terms of the available staff and funding resources.

- **PLAN MAINTANENCE**

The MPT reviewed the plan monitoring process. It was agreed that the Emergency Services Director will still be responsible for contacting MPG members and organizing meetings and will monitor progress on the mitigation action items. Monitoring was highlighted to emphasis that it is important for future eligibility for any mitigation funding that may be available.

The MPT know that the entire hazard mitigation plan will be reviewed, revised, and updated every five years from the date of FEMA's approval. HMP requirements shall be incorporated into other county plans, as appropriate, during the normal review and update of those plans If a disaster occurs or as action items are met, the plan will be reviewed, revised, and updated sooner than the required five years. Most importantly, the MPT is dedicated on continuing public involvement, providing a forum where the public can express concerns, opinions, or ideas about the plan.

- **CONCLUSION**

- It was agreed upon that an additional MPT meeting will not be scheduled at this time. Once all the updated information is compiled and drafted into the updated plan then a possible MPT meeting will be scheduled. When needed, individual meetings that do not warrant the entire MPT will be setup by the facilitator.
- Facilitator will be meeting with the NM Acequia Association.



- Curt Temple, Interim Road Dept. Director, will be sending additional information/maps on the National Flood Insurance Program (NFIP).
- **ADJOURN**

Lincoln County HMP/LPT

Meeting Minutes

Date: April 3, 2017, 2:00 pm

Location: Lincoln County Emergency Operations Center

Attendees: Curt Temple, Planning Director  
Joe Kenmore, Emergency Manager

The team (LPT) discussed hazards and their priority. They agreed that Wildfire, Severe Winter Storms, Thunderstorms, Flood, Dam Failure and Drought are the hazards that affect Lincoln County. Critical facilities were listed and Mitigation projects were applied to each hazard and critical facilities. Hazards, Critical facilities and Mitigation Projects are listed on the two documents:

- ☐ Lincoln County Critical Facilities
- ☐ Lincoln County Hazards and Projects

The meeting adjourned at 5:30

Capitan LPT Meeting

Meeting Minutes

Date: April 11, 2017 3:00 pm

Location: Capitan Village Hall

Attendees: David Cox, Public Works Director

Meeting with David Cox, Capitan Public Works Director to identify the Capitan critical facilities, hazards and mitigation projects for the HMP. The hazards identified were:

- ☐ Wildfire
- ☐ Severe Weather
- ☐ Drought

Critical facilities and Mitigation projects were discussed and identified on the following two documents:

- ☐ Capitan Critical Facilities
- ☐ Capitan Hazards and Projects

The meeting was adjourned at 6:30 pm.

**Carrizozo LPT Meeting**

**Meeting Minutes**

**Date:** April 11, 2017 3:00 pm

**Location:** Carrizozo Town Hall

**Attendees:** Mayor Rick Hyatt, Leann Weilbreght, Clerk,

**Carrizozo One-on-One HMP Meeting**

**April 11, 2017 8:30 am**

**Carrizozo**

Meeting with Mayor Rick Hyatt and Clerk Leann Weihbreght to develop Mitigation projects and strategies. The team identified the critical facilities and several mitigation projects to mitigate the hazards identified. The hazards include, by priority, Wildfire, Severe Weather, & Drought. The critical facilities and projects are identified in two documents:

- ☐ Carrizozo Critical Facilities
- ☐ Carrizozo Hazards and Projects

Corona LPT Meeting

Meeting Minutes

Date: April 12, 2017 10:00 am  
Location: Corona Town Hall  
Attendees: William Hignight, Mayor  
William Weckwerth, Assistant  
Brad Gage, Fire Chief  
Joe Kenmore, Lincoln County Emergency Manager

Joe Kenmore, Mayor William Hignight, Brad Gage, William Weckwerth

The team discussed hazards and their priority. They agreed that Wildfire, Severe Weather and Drought are the hazards that affect Corona. Critical facilities were listed and Mitigation projects were applied to each hazard and critical facilities. Hazards, Critical facilities and Mitigation Projects are listed on the two documents:

- ☐ Corona Critical Facilities
- ☐ Corona Hazards and Projects

Meeting was adjourned at 11:15

Ruidoso/Ruidoso Downs LPT

Meeting Minutes

Time and Date: April 19, 2017 10:00 am

Location: Ruidoso Fire Station #1

Attendees: Steve Dunigan, Planning Coord, Ruidoso Downs  
Randall Kalama, Acting Emergency Manager, VOR  
JR Baumann, Public Works Director, VOR  
Debi Lee, Village Manager, VOR  
Bradford Dyjak, Planning Director, VOR  
Adam Sanchez, Water/Sewer Director, VOR  
Darren Hooker, Police Chief, VOR  
Dick Cooke, Village Forester, VOR  
Lawrence Chavez, Police LT., VOR  
Cody Thedford, Acting Fire Chief, VOR

The team (LPT) discussed hazards and their priority. They agreed that Wildfire, Thunderstorm, Flood and Drought are the hazards that affect Ruidoso Downs and Wildfire, Severe Weather, Flood, Drought and Dam Failure are the hazards that affect the Village of Ruidoso. Critical facilities were listed and Mitigation projects were applied to each hazard and critical facilities. Hazards, Critical facilities and Mitigation Projects are listed on the four documents:

- ☐ Ruidoso Critical Facilities
- ☐ Ruidoso Hazards and Projects
- ☐ Ruidoso Downs Critical Facilities
- ☐ Ruidoso Downs Hazards and Projects

The meeting adjourned at 12:35

## **APPENDIX C**

### **VOR Fuels Management Program**



**Chapter 42 - FIRE PREVENTION AND PROTECTION**

**Sec. 42-70. - Fuels management: duty to abate and control wildfire fuels.**

- (a) It shall be the duty of every owner, occupant, and person in control of any land or interest therein or premises which are located within the jurisdictional limits of the village, to control and/or abate therefrom all flammable vegetation that constitutes a fire hazard which may endanger or damage neighboring property.
- (b) The monthly fees for forest debris collection and disposal shall apply to all lots in all districts whether improved or not. The monthly rates for collection and disposal of forest debris shall be set from time to time and are listed in the fee schedule in appendix A to this Code.

(Ord. No. 2002-06, 6-25-02; Ord. No. 2012-07, 6-26-12)

**Sec. 42-71. - Standards for abatement and control.**

The standards for abatement and control are specified in section 42-80.

(Ord. No. 2002-06, 6-25-02; Ord. No. 2004-04, 5-11-04)

**Sec. 42-72. - Enforcement on private and public property.**

- (a) Cooperation from all landowners, private and public, will be encouraged through positive communication by mail and through personal contact. When flammable vegetation control measures are not carried out by a landowner, enforcement measures may be instituted. Procedures for enforcement shall be as specified in this article.
- (b) Abatement and control priorities shall be established due to the size of the village and the number of landowners therein. The priority for enforcement shall be as follows:
  - (1) Lands within the Urban Wildland Interface Zone located West of Mechem Drive and South of Sudderth Drive.
  - (2) Property bordering lands of the federal government, including Indian lands.
  - (3) Properties found to be over 75 on the fire hazard rating.
  - (4) Properties found to be over 60 on the fire hazard rating.
  - (5) All other property.

(Ord. No. 2002-06, 6-25-02; Ord. No. 2004-04, 5-11-04)

**Sec. 42-73. - Notice to remove.**

It shall be the concurrent duty of the director of forestry, fire chief, and the planning administrator either of whom shall have authority to issue notices, together with their duly authorized representatives, to enforce the abatement and control measures of this article by issuing a (notice to remove) by mailing the notice to the property owner as his or her name appears on the county tax rolls and to the address as shown in the records of the county tax assessor. The notice shall be substantially in the form used to notify property owners of code violations. The notice shall include a copy of the standards for abatement and control specified in section 42-80.

(Ord. No. 2002-06, 6-25-02; Ord. No. 2004-04, 5-11-04)

**Sec. 42-74. - Appeals.**

Any person who is adversely affected by a notice as provided herein shall have the right to appeal to the planning commission, the governing body and district court as provided in chapter 54 of this Code.

(Ord. No. 2002-06, 6-25-02)

**Sec. 42-75. - Removal of hazardous vegetation by private contractor and establishment of costs and administrative fee.**

If, at the end of the time allowed for compliance in the original notice, or as extended in cases of appeal, compliance has not been accomplished, the officer issuing the notice or the agency of which he is an officer, may pursue judicial enforcement according to the provisions of sections 54-38 and 42-78 of this Code. The village may, upon court order, provide for abatement and control to be performed by public officers or employees of the village, or may cause the removal to be carried out by a private contractor selected by the village in accordance with applicable purchasing procedures and in the manner and under the terms specified by the officer. The cost of such removal accompanied by a reasonable administrative charge may be imposed as a special assessment upon the property, and such property shall be subject to a special assessment lien for said purpose. The costs so assessed shall be limited to the actual costs incurred by the village in enforcing abatement and control upon the parcels, including payment to the contractor, costs of investigation, boundary determination, measurement, clerical, personnel, consultant, legal and an administrative cost to be set by the village on those properties where such hazardous vegetation has not been removed by the property owner at his or her own expense.

(Ord. No. 2002-06, 6-25-02)

**Sec. 42-76. - Mailing and recording of assessments.**

All assessments provided for herein shall be mailed by certified mail to the property owner as specified in the provisions for mailing notices. The assessment shall be filed as a lien against the property in the manner provided by law for filing of liens.

(Ord. No. 2002-06, 6-25-02)

**Sec. 42-77. - Enforcement of lien.**

Liens may be enforced and foreclosed as provided by law.

(Ord. No. 2002-06, 6-25-02)

**Sec. 42-78. - Violations.**

Failure of a person to abate and control hazardous vegetation upon notice shall be a violation of this Code, and may be prosecuted and punished in Ruidoso Municipal Court as provided in this Code. Any such prosecution shall be in addition to the abatement and control measures provided for in this article.

(Ord. No. 2002-06, 6-25-02)

**Sec. 42-79. - Non-waiver of immunity.**

Nothing contained herein shall be construed as waiving the immunity of the village, its officers, agents, servants and employees, as may be provided for in the New Mexico Tort Claims Act, and neither the village, nor its officers, agents, servants and employees shall be liable to any person for enforcement of the provisions of this article.

(Ord. No. 2002-06, 6-25-02)

**Sec. 42-80. - Fuels management standards.**

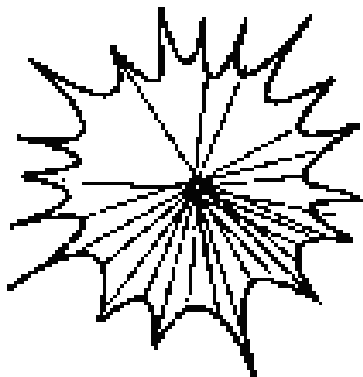
The intent of these standards is to reduce the potential for a catastrophic crown fire within the village while preserving the forested appearance of the village. The goal is to retain a forest environment with a 40 square foot per acre minimum basal area density of mature trees. This translates to 40, 14-inch diameter trees per acre. When computing minimum required basal area, trees smaller than 14-inch diameter will be projected to grow to 14-inch diameter.

- (a) All properties shall meet the following requirements for each particular zone. Upon determination by the village that a property is in compliance, the village will issue a letter to the property owner. Initial thinning should normally last a period of ten years before ladder fuels and tree growth are sufficient to require a maintenance thinning. Maintenance activities such as pine needle raking and ladder fuel removal shall be conducted on a yearly basis. However, circumstances such as drought and bark beetle mortality can cause a property to deviate from these standards and become non-compliant. Should a property not be maintained or otherwise become non-compliant, the property owner will be notified to correct the problem and be given a timeframe for coming back into compliance. Should compliance not be obtained in the established timeframe, the property shall be designated non-compliant and the landowner of record will be assessed a fine, increase in billing, or other penalties that are in effect until such time as the property is again in compliance.
- (1) Zone 1 Structure Protection (zero to ten feet from structure or deck). This zone should be devoid of flammable vegetation as much as possible. Trees within this zone shall be considered a part of the structure and the zone extended accordingly.
  - a. Remove all non-decomposing pine needles, flammable ground materials and activity slash. Pine needles are to be raked and placed appropriately for Village removal.
  - b. Remove all ladder fuels including shrubs beneath the crown of conifers.
  - c. Separation between crowns is per chart 42-80 #2.
  - d. Maximum of five similar sized trees with overlapping crowns then there must be separation as per chart 42-80 #2.
  - e. Prune all species at least 15 feet above ground and, if tree height permits, ten feet above structure eave.
  - f. Conifers that can't be trimmed to structure eave shall be removed.
  - g. Removal of any live tree greater than 20 DBH requires a permit.
  - h. No wood chips allowed except in planting beds.
  - i. No firewood stored unless covered by approved fire retardant cover.
  - j. No flammable construction material stored unless covered by fire retardant cover.
  - k. No standing dead trees allowed.
  - l. Grass and common weeds shall be trimmed low to ground or eliminated.
  - m. Planted vegetation shall be fire resistant and low growing.
  - n. There shall be no low growing flammable vegetation such as juniper (including ornamental juniper).

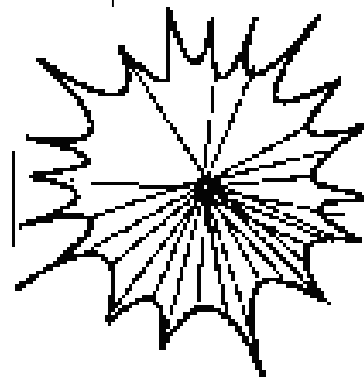
- o. Roofs and gutters shall be kept free of pine needles and other debris.
  - (2) Zone 2 Defensible Space (greater than ten feet up to 200 feet from structure or deck as dictated by slope chart 42-80 #3). The intent of this zone is to reduce the threat to a structure from an advancing wildfire.
    - a. Remove all non-decomposing pine needles, flammable ground materials and activity slash within 30 feet of a structure,
    - b. Remove all ladder fuels including brush beneath crowns.
    - c. Minimum crowns separation of trees or "clumps" (maximum five similar sized trees per clump) as per chart 42-80 #2.
    - d. Separation of brush species shall be as per chart 42-80 #2.
    - e. Pine needles and grasses on vacant properties adjacent to residences and within residential areas shall be removed on a yearly basis so as not to provide a continuous fuel source in the event of a wildfire..
    - f. Prune all species a minimum of ten feet from ground within 30 feet of structure or one third of tree height, whichever is less. Ornamental conifers such as Blue Spruce may be left untrimmed providing spacing and low ground fuels are maintained to minimize ignition potential.
    - g. Minimum ten feet recommended between planting beds.
    - h. Removal of any live tree greater than 20 inches DBH requires a permit.
    - i. No wood chips allowed except in planting beds within 30 feet of structure.
    - j. No firewood stacked within 20 feet of structures unless under approved fire retardant cover. All firewood must comply with the beetle habitat reduction requirements contained in subsection 54-133(c)(5)c. Firewood must be stacked with no more than two cords per stack.
    - k. No flammable conifers less than eave height within 20 feet of vents, windows or doors.
    - l. No standing dead trees within 60 feet of structure
  - (3) Zone 3 Forest Woodlands (from the end of zone 2 to the edge of the property). This zone includes vacant lots and properties less than five acres in size. Where the property is within the defensible space of another property, zone 2 standards shall apply. This zone shall maintain an open forested appearance with well-spaced trees and openings. The zone should contain a variety of tree species of various ages. Groups of trees should be of similar ages and heights. Different groups will provide the multiple age structure and size structure.
    - a. Remove all ladder fuels.
    - b. Separation shall be as per chart 42-80 #2.
    - c. Every effort shall be made to remove and utilize bole wood over six inches in diameter.
    - d. Trim all species to six feet or one-third the height of the tree, whichever is less, measuring from the uphill side of the tree. Insure that shorter tree groups are upwind of taller tree groups (acts as ladder fuel).
    - e. Except when the property has a fuels management plan approved by the director of forestry, removal of any live tree greater than 20 DBH requires a permit.
    - f. Mastication and chipping of slash are allowed for slash disposal. Wood depth shall not exceed two inches. Bole wood over six inches in diameter shall be removed.
    - g. Where possible all slash shall be removed, masticated or chipped. On steep slopes or where access is limited, alternative fuels management slash treatments may be approved by the director of forestry.

- h. Green wood retained for firewood shall be treated for beetle habitat per subsection 54-133(c)(5)c.
  - i. Up to three, 12-inch DBH or larger non-hazardous standing dead trees may be retained per acre for wildlife habitat. Recent beetle killed trees must be harvested and removed or treated as per subsection 54-133(c)(5)c.
  - j. All non-decomposing ground debris greater than five inches in diameter shall be removed, except up to five downed logs per acre greater than 12 inches in diameter may be retained for wildlife habitat.
- (4) Large tracts (more than five acres with or without structures). A fuels reduction plan shall be prepared and/or approved on a case by case basis by the director of forestry. Where structures are involved they shall be treated as in zones 1 and 2. The zone shall have an open forested appearance. These properties shall be treated with the intent to keep a wildfire on the ground to minimize spotting potential. The goal of treatment is to prevent a stand replacing crown fire. Some untreated areas may remain to meet agreed upon objectives providing there is sufficient treated area surrounding the untreated areas to mitigate crown fire spread.
- a. Treated areas of the properties shall have no ladder fuels.
  - b. Separation of trees shall be as per chart 42-80 #2 as near as possible. Modification of this Separation may be approved by the director of forestry to meet specific objectives.
  - c. Perimeter thinning shall be of sufficient width to prevent a sustainable crown fire from advancing to an adjacent property.
  - d. Every effort shall be made to remove and utilize bole wood over five inches in diameter. Bole wood not removed shall be felled along the contour or otherwise treated upon direction of the director of forestry.
  - e. Except when the property has a fuels management plan approved by the director of forestry, removal of any live tree greater than 20 DBH requires a permit.
  - f. Where possible, slash shall be treated with full removal, mastication or chipping. Lop and scatter may be used as a less desirable alternative.
  - g. If lop and scatter is allowed, slash shall be lopped and scattered to less than two feet in depth to accelerate decomposition. Lopped and scattered slash shall not be placed under the drip line of residual trees.
  - h. No standing dead trees are allowed within 150 feet of the property perimeter.
  - i. Trees shall be pruned where appropriate to meet objectives but may be left un-pruned if Separation is adequate to prevent fire movement from tree to tree.
  - j. If a zone 4 property is used for a commercial purpose, a fuels management plan shall be developed in partnership with the landowner to meet the commercial objectives and manage fuels on the site. The signed plan will be an agreement between the director of forestry and the landowner for the certification period. If the director of forestry and the landowner cannot come to agreement, the matter will be presented to the planning and zoning commission for resolution.

Crown Separation Measurement Diagram  
Chart 42-80 #1



X



X

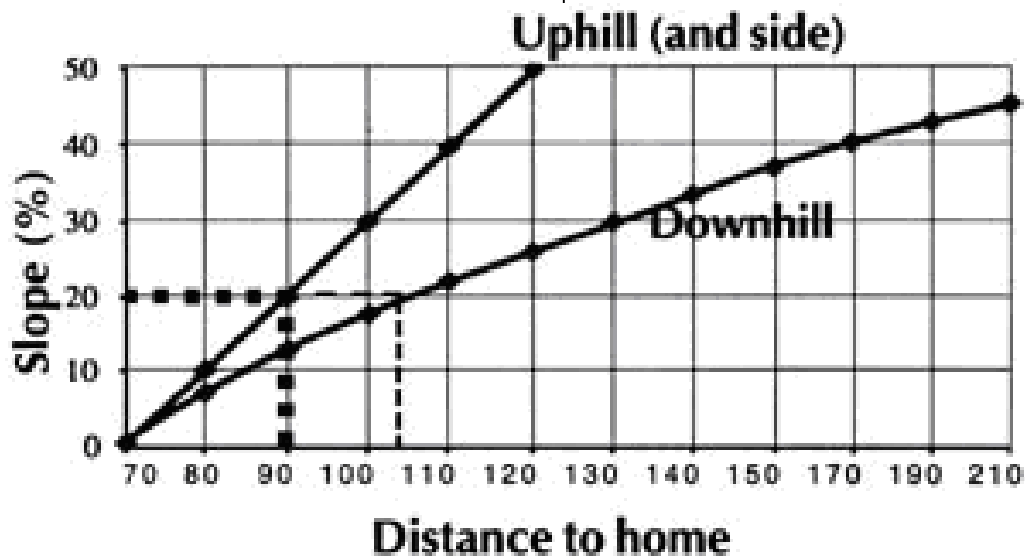


Y

Measure crown separation (X) from the outside of the crown of one tree or clump of trees to the outside of the crown of the next tree.

Minimum Tree Crown and Shrub Clump Separation Chart 42-80 #2			
Percent (%) Slope	Individual Tree Crown Separation	Tree Group Crown Separation	Brush and Shrub Clump Separation in feet
0-10 %	10'	15'	2½ times shrub height
11-20%	15'	20'	3 times shrub height
21-40%	20'	25'	4 times shrub height
40%	30'	35'	6 times shrub height

Zone 2 Defensible Space Outer Edge Measurement based on Slope  
Chart 42-80 #3



This chart indicates the minimum recommended dimensions for defensible space from the home to the outer edge of zone 2. For example: if the home is situated on a 20-percent slope, the minimum defensible space dimensions would be 90 feet uphill and to the sides of the home and 104 feet downhill from the home.

(Ord. No. 2002-04, 6-25-02; Ord. No. 2002-06, 6-25-02; Ord. No. 2004-04, 5-11-04; Ord. No. 2006-04, 6-27-06; [Ord. No. 2013-06](#), 7-9-13)

Sec. 42-81. - Fire hazard ratings form.

Forestry official will complete this form on site during the lot assessment.



	POINTS		POINTS
Subdivision Design		Fire Protection	
Ingress/Egress		Fire Response	
Two ways to evacuate neighborhood within 1,000'	1	Property located in Village of Ruidoso	1
One way to evacuate neighborhood within 1,000'	3	Property located in County	5
One way to evacuate neighborhood > 1,000' away	5	Water Supply	
Width of Primary Road @ driveway		500 GPM Hydrant within 1,000 feet	1
20 feet or more	1	Hydrant farther than 1,000 feet or draft site	3
Less than 20 feet	3	Water source 20 min or less, round trip	5
Accessibility		Water source farther than 20 min, round trip	10
Road grade 5% or less (avg. within 1,000')	1	Utilities (electric service)	
Road grade more than 5% (avg. within 1,000')	3	Underground mains and service lines	1
Secondary Road Terminus		Underground service lines only	3

Not a dead-end	0	Aboveground service lines	5
Loop roads, cul-de-sacs with an outside radius of 45 feet or greater	1	Construction Materials	
Cul-de-sac turnaround	3	Siding	
Dead-end roads 200 feet or less in length	3	Noncombustible	1
Dead-end roads greater than 200 feet in length	5	Combustible	5
Average Lot Size		Deck	
10 acres or larger	1	Noncombustible	1
Larger than 1 acres, but less than 10 acres	3	Decks over 6' w/noncombustible uprights	1
1 acres or less	5	Combustible w/firesafe crawlspace	3
Street Signs		Combustible	5
Present	1	Sofits	
Not present	5	Parapet/Santa Fe style/1hr. rated enclosed	0
Vegetation (UWIC Definitions)		Enclosed	1
		Open	5

Fuel Types		Windows	
Light	1	Low E	1
Medium	5	Double Pane	3
Heavy	10	Single Pane	5
Defensible Space (what is possible?)		Roof	
More than 100 feet of treatment from buildings	1	Class A Fire Rated	1
Less than 100 feet of treatment from buildings	5	Class B Fire Rated	3
Adjacent Landscape (within 10 feet)		Class C Fire Rated	5
Installed Landscape (within 10 feet)		Non-Rated	10
Xeriscape or dirt	0	Stem Walls/Structural Support	
Flame Resistant Plants	1	Non Combustible Enclosed	1
Flammable Plants	3	Combustible Enclosed	3
Flammable Ties and Timbers	5	Non-Combustible Post & Beam	5
Topography		Combustible Post & Beam	10

Slope 10% or less	1 _____		
Slope more than 10%, but less than 20%	4 _____		
Slope more than 20%, but less than 30%	7 _____	FIRE HAZARD RATING	_____
Slope 30% or more	10 _____	Med= ≤59; High= 60-74; Extreme= ≥75	
LOT ASSESSMENT FEE \$ _____		APPROVED _____/_____/_____	
FOOTPRINT DEBRIS FEE \$ _____		BY _____/_____/_____	

Explanation of Sec. 42-81 Fire Hazard Ratings Form categories

Subdivision Design

- Ingress/Egress - In the event of a fire, how many ways within 1,000 feet of the building site, do fire trucks have to get in and evacuees get out of the neighborhood or subdivision? Ex: Parts of Upper Canyon (Main Road) have only one way in and one way out.
- Width of Primary Road - Can large fire trucks and evacuating vehicles pass by each other easily? Measure from centerline of road to edge of pavement. If unpaved measure to edge of 2X4 drivable surface. Then multiply by 2. Measure in feet.
- Accessibility - Steepness of the road can slow the response time of a fire truck full of water. Have the surveyor do this when the plot plan is being done. Measure average grade within 1,000 feet of building site.
- Secondary Road Terminus - This has to do with maneuvering fire trucks safely as they arrive at your site. What best describes what yours looks like.
- Average Lot Size - Use the size on the plot plan if this is a single lot development. Use the average lot size if this is a subdivision development.
- Street Signs - Are there street signs present or will there be (subdivision development).

Vegetation (UWIC definitions)

- Fuels Types - Relates to rate of fire spread in the general, adjacent area. Light fuels are those where average height of predominant vegetation is less than 3 feet tall. Medium is 3 feet to 6 feet

tall. Heavy is greater than 6 feet tall. Predominant vegetation covers the majority of ground when viewed as a landscape or "bird's eye" view.

- **Defensible Space** - Achieving compliance with Sec. 42-80 Fuels Management Standards requires a Forestry Department final inspection. The lot size will determine if you can achieve 100' of defensible space around the structure. If you are building in a high density area, a distance of 100 feet from your structure may include adjacent lots. The condition of adjacent lots within 100 feet will not affect your rating calculation.
- **Adjacent Landscape (within 10 feet)** - This refers to planted vegetation. In general, if you are watering or irrigating a planting bed, it is considered non-flammable. See Firewise Plant Materials for a detailed list.

**Topography** - Your surveyor can establish this per the plot plan. The Forester will verify in the field. This is the same as required on the site development plan.

#### **Fire Protection**

- **Water Supply** - All Village fire hydrants are considered to produce a minimum of 500 gallons per minute. 1,000 feet is measured from the hydrant to the structure. A draft site can be a lake, pond, tank, swimming pool, etc that has a minimum of 3000 gallons. Where no hydrants exist, check with your Fire Department to determine round trip time frames.

**Utilities** - This refers to ELECTRIC POWER ONLY and does not include communications. Main lines run along roads and easements. Service lines are those that connect to your structure.

#### **Construction Material**

- **Siding** - Non-combustible siding includes but not limited to stucco, rock, concrete, brick, metal, true log construction, adobe, and concrete block. Combustible siding includes wood, T-111 plywood and composition materials. Check with the manufacturer.
- **Decks** - Non-combustible decking material includes metal or composites like Trek. Non-combustible uprights include metal and heavy timbers (8"x8" post and beam). Non-combustible crawlspace are built solid with non-combustible material or skirted with ¼"x ¼" wire mesh for decks with an average height of less than 2 feet above grade. Check with the manufacturer.
- **Sofits** - Class I (1hr. enclosed): Facsia = 2"x 4", 6", 8", Soffit = 5/8" FireX sheetrock underlay or stucco with no venting. Class II: Facsia = 1"x 4", 6", 8" lumber, Soffit = 1" material, no venting
- **Windows** - Low E windows have high reflectivity properties. They are marked in the corner of the pane like tempered glass is labeled. These may be used in one area or on one side of structure to reduce rating.
- **Roofing** - Check with roofing suppliers or manufacturers for proper assembly of roof materials and roof classifications A, B, or C.
- **Stem Wall** - Non-combustible material includes block, stucco, concrete and ¼"x ¼" wire mesh. Non-combustible post and beam includes: metal poles and heavy timber (8"x8" or >).

(Ord. No. 2002-06, 6-25-02; Ord. No. 2004-04, 5-11-04; Ord. No. 2006-04, 6-27-06)

## **APPENDIX D**

### NFIP Maps

**APPENDIX E**

Lincoln County Acequia Association

## LINCOLN COUNTY ACEQUIAS

Acequia Name		Stream System	County	First Name	Last Name
		<b>Rio Bonito</b>			
1	Lincoln Acequia Water Users	Rio Bonito	Lincoln	Bill	Strauser
2	Government Springs Ditch	Rio Bonito	Lincoln	Ervin	Aldaz
3	Providencia Ditch	Rio Bonito	Lincoln	Steve	Sanchez
4	Gonzales Ditch	Rio Bonito	Lincoln		
5	Sedillo Ditch	Rio Bonito	Lincoln	Sara	Gutierrez
6	Lutz Ditch	Rio Bonito	Lincoln	James	Taylor
7	Cruz de Jara Ditch	Rio Bonito	Lincoln	Sara	Gutierrez
8	Protectora Ditch	Rio Bonito	Lincoln	Sally	Canning
9	Lincoln Ditch (underground pipe)	Rio Bonito	Lincoln	Bill	Strauser
10	Titsworth Ditch	Rio Bonito	Lincoln	BLM Unit#2	Scot Chapman
11	Laws Ditch North	Rio Bonito	Lincoln	James	Sanchez
12	Laws Ditch South	Rio Bonito	Lincoln	James	Sanchez
13	Hulbert Ditch	Rio Bonito	Lincoln		
14	F. Chavez Ditch (Dow)	Rio Bonito	Lincoln	BLM Unit#3	Scot Chapman
15	Emil Fritz Ditch	Rio Bonito	Lincoln	Booky	Robert
16	Las Chosas Ditch	Rio Bonito	Lincoln	Dale	Boren
17	Elena Vigil Ditch	Rio Bonito	Lincoln	Jerry	Burchett
18	Bradstreet & Vorwerk Ditch	Rio Bonito	Lincoln	Lucinda	Loveless
20	Kirkland Ditch	Rio Bonito	Lincoln	Salas	James
19	<b>TOTAL</b>				
Acequia Name		Stream System	County	First Name	Last Name
1	J & P Analla Ditch	Rio Hondo	Lincoln	Lorena	Radcliff
2	F & M Analla Ditch	Rio Hondo	Lincoln	Lorena	Radcliff
3	Serrano Ditch	Rio Hondo	Lincoln	Robert	Anderson
4	Picacho Ditch	Rio Hondo	Lincoln	Royce	Griggs



5	P. Chavez Spring Ditch	Rio Hondo	Lincoln		
6	Analla Spring Ditch	Rio Hondo	Lincoln		
7	Pas Torrez Ditch	Rio Hondo	Lincoln		
8	Casey & Ramon Vigil Ditch	Rio Hondo	Lincoln		
9	Buck Guyse Ditch (South Side Casey)	Rio Hondo	Lincoln		
10	Picacho Ditch	Rio Hondo	Lincoln		
11	Kline Ditch	Rio Hondo	Lincoln		
12	Circle Diamond Ditch	Rio Hondo	Lincoln		
13	Michaelis Ditch	Rio Hondo	Lincoln		
14	Montano Ditch	Rio Hondo	Lincoln		
15	Main Ditch	Rio Hondo	Lincoln		
16	Diamond A	Rio Hondo	Lincoln		
17	High Line Ditch	Rio Hondo	Lincoln		
18	Bloom Ditch	Rio Hondo	Lincoln		
<b>18</b>	<b>TOTAL</b>				

Acequia Name		Stream System	County	First Name	Last Name
1	Ambrocio/Pablo Chavez Ditch	Rio Ruidoso	Lincoln	Orlando	Gutierrez
2	Ambrocio Chavez Ditch No. 1	Rio Ruidoso	Lincoln	Salas	James
3	Maxwell Ditch	Rio Ruidoso	Lincoln	Earl	Allison
4	San Patricio Ditch	Rio Ruidoso	Lincoln	Michael	Hurd
5	Pablo Chavez Ditch	Rio Ruidoso	Lincoln		
6	Chosas North Ditch (A. Sanchez Community Ditch)	Rio Ruidoso	Lincoln		
7	Hale North Ditch	Rio Ruidoso	Lincoln	Leonard	McCutcheon
8	Hale South Ditch	Rio Ruidoso	Lincoln	Leonard	McCutcheon
9	Avent Ditch	Rio Ruidoso	Lincoln	Leonard	McCutcheon
10	Bracken Ditch	Rio Ruidoso	Lincoln	Leonard	McCutcheon
11	A. Sanchez Ditch	Rio Ruidoso	Lincoln	L.W.	Haney
12	Storm Ditch	Rio Ruidoso	Lincoln	Lela	Wright
13	F. Sanchez North Ditch	Rio Ruidoso	Lincoln	Frank	Gomez
14	F. Sanchez South Ditch	Rio Ruidoso	Lincoln	Frank	Gomez

15	Hewitt Ditch	Rio Ruidoso	Lincoln	W.C.	Williams Jr.
16	L. Gallegos Ditch	Rio Ruidoso	Lincoln	Henry	Silva
17	Barragon and West Ditch aka Newcomb Ditch	Rio Ruidoso	Lincoln	Kenneth	Nosker
18	Leopoldo Gonzales Ditch	Rio Ruidoso	Lincoln	Eli	Salcido
19	Chosas South Ditch	Rio Ruidoso	Lincoln	Manuel	Corona
20	Lower Chosas South Ditch	Rio Ruidoso	Lincoln	George	Romero
21	F. Herrera South Ditch (Gomez Ditch)	Rio Ruidoso	Lincoln	Ira	Miller
22	J. Tully Ditch North	Rio Ruidoso	Lincoln	Gerald	Tully
23	J. Tully Ditch South	Rio Ruidoso	Lincoln	Gerald	Tully
24	Mes Ditch	Rio Ruidoso	Lincoln	Michael	Hurd
25	Upper Chosas South Ditch	Rio Ruidoso	Lincoln	Richard	Montoya
26	Analla-Barragon Community Ditch	Rio Ruidoso	Lincoln	Kenneth	Nosker
27	Limacher Ditch	Rio Ruidoso	Lincoln	Walter	Limacher
28	C. Hilbern Ditch	Rio Ruidoso	Lincoln		
29	F. Hilbern Ditch	Rio Ruidoso	Lincoln		
30	F. Coe Ditch North	Rio Ruidoso	Lincoln		
31	F. Coe Ditch South	Rio Ruidoso	Lincoln		
32	P. Gallegos Ditch	Rio Ruidoso	Lincoln	Booky	Robert
33	G. Coe Ditch	Rio Ruidoso	Lincoln	Clark	Talor
34	R. Coe Ditch	Rio Ruidoso	Lincoln		
35	R. Herrera Ditch	Rio Ruidoso	Lincoln		
36	Miller Ditch	Rio Ruidoso	Lincoln		
37	Frank Allison Ditch	Rio Ruidoso	Lincoln		
38	Pope Ditch	Rio Ruidoso	Lincoln		
39	Mirabel & Norman Ditch	Rio Ruidoso	Lincoln		
40	E Silva Ditch	Rio Ruidoso	Lincoln		
41	P. Gonzales Ditch	Rio Ruidoso	Lincoln		
42	J & P Analla Ditch	Rio Ruidoso	Lincoln		
<b>42</b>	<b>TOTAL</b>				
<b>79</b>	<b>Overall Total</b>				

## **APPENDIX F**

Plan maintenance documentation

Worksheet 7.1  
Mitigation Action Progress Report

## Mitigation Action Progress Report Form

Progress Report Period	From Date:	To Date:
Action/Project Title		
Responsible Agency		
Contact Name		
Contact Phone/Email		
Project Status	<p><input type="radio"/> Project completed</p> <p><input type="radio"/> Project canceled</p> <p><input type="radio"/> Project on schedule</p> <p><input type="radio"/> Anticipated completion date: _____</p> <p><input type="radio"/> Project delayed</p> <p>Explain _____</p>	

### Summary of Project Progress for this Report Period

1. What was accomplished for this project during this reporting period?

---

---

2. What obstacles, problems, or delays did the project encounter?

---

---

3. If uncompleted, is the project still relevant? Should the project be changed or revised?

---

---

4. Other comments

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Worksheet 7.2  
Plan Update Evaluation

## Plan Update Evaluation Worksheet

Plan Section	Considerations	Explanation
Planning Process	Should new jurisdictions and/or districts be invited to participate in future plan updates?	
	Have any internal or external agencies been invaluable to the mitigation strategy?	
	Can any procedures (e.g., meeting announcements, plan updates) be done differently or more efficiently?	
	Has the Planning Team undertaken any public outreach activities?	
	How can public participation be improved?	
	Have there been any changes in public support and/or decision-maker priorities related to hazard mitigation?	
Capability Assessment	Have jurisdictions adopted new policies, plans, regulations, or reports that could be incorporated into this plan?	
	Are there different or additional administrative, human, technical, and financial resources available for mitigation planning?	
	Are there different or new education and outreach programs and resources available for mitigation activities?	
	Has NFIP participation changed in the participating jurisdictions?	
Risk	Has a natural and/or technical or human-caused disaster occurred?	
	Should the list of hazards addressed in the plan be modified?	
	Are there new data sources and/or additional maps and studies available? If so, what are they and what have they revealed? Should the information be incorporated into future plan updates?	

Assessment	Do any new critical facilities or infrastructure need to be added to the asset lists?	
	Have any changes in development trends occurred that could create additional risks?	
	Are there repetitive losses and/or severe repetitive losses to document?	

Plan Section	Considerations	Explanation
Mitigation Strategy	Is the mitigation strategy being implemented as anticipated? Were the cost and timeline estimates accurate?	
	Should new mitigation actions be added to the Action Plan? Should existing mitigation actions be revised or eliminated from the plan?	
	Are there new obstacles that were not anticipated in the plan that will need to be considered in the next plan update?	
	Are there new funding sources to consider?	
	Have elements of the plan been incorporated into other planning mechanisms?	
Plan Maintenance Procedures	Was the plan monitored and evaluated as anticipated?	
	What are needed improvements to the procedures?	

## **APPENDIX G**

### **EAP Breach Inundation Data**

## ALTO LAKE DAM

### Residents/Businesses/Highways at Risk

A major flood caused by a sudden breach of the dam could inundate multiple residential and commercial structures, as well as local roads, which are shown on the Inundation Maps (see Appendix B-3; Evacuation Map). A brief list of the areas and major roads that may be inundated includes but is not limited to:

- Potentially-occupied buildings located along the floodplain of Eagle Creek between the dam and the confluence with Rio Ruidoso, as well as the floodplain of the Rio Ruidoso between the confluences of Eagle Creek and the Rio Hondo, and the floodplain of the Rio Hondo from the confluence with the Rio Ruidoso to Two Forks Reservoir.
- U.S. Highway 70 (from west of the Eagle Creek confluence with the Rio Ruidoso to where the highway leaves the Rio Hondo valley)
- State Highway 214 (from the north edge of Eagle Creek valley to the intersection with U.S. Highway 70)

This list is approximate and may vary pending actual flood conditions. If an emergency situation occurs and requires evacuation, evacuate all residences in the evacuation area according to the Evacuation Map in Appendix B-3.

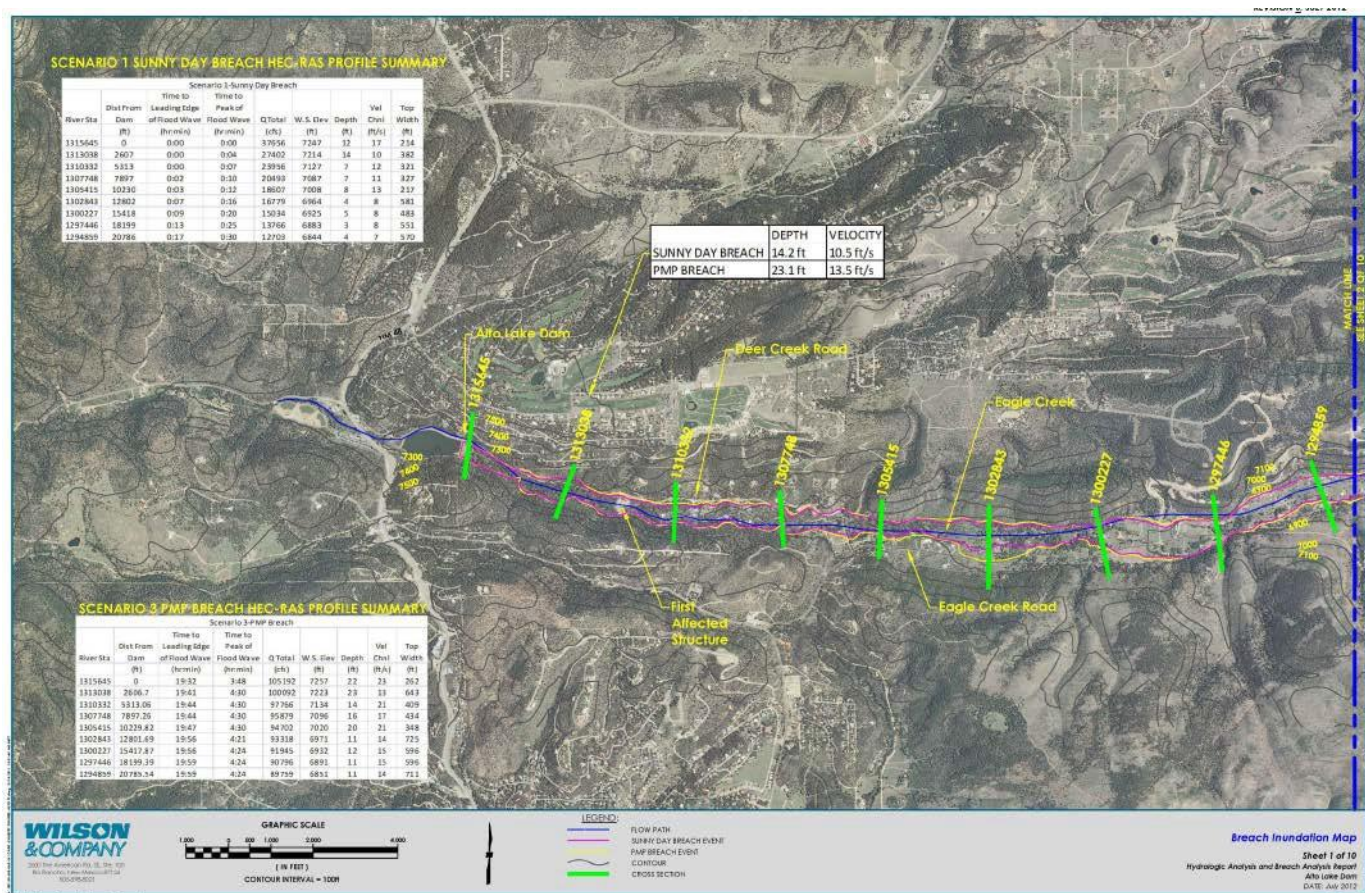
The Local Emergency Official is responsible for initiating evacuation of residents at risk when an emergency situation has been determined.

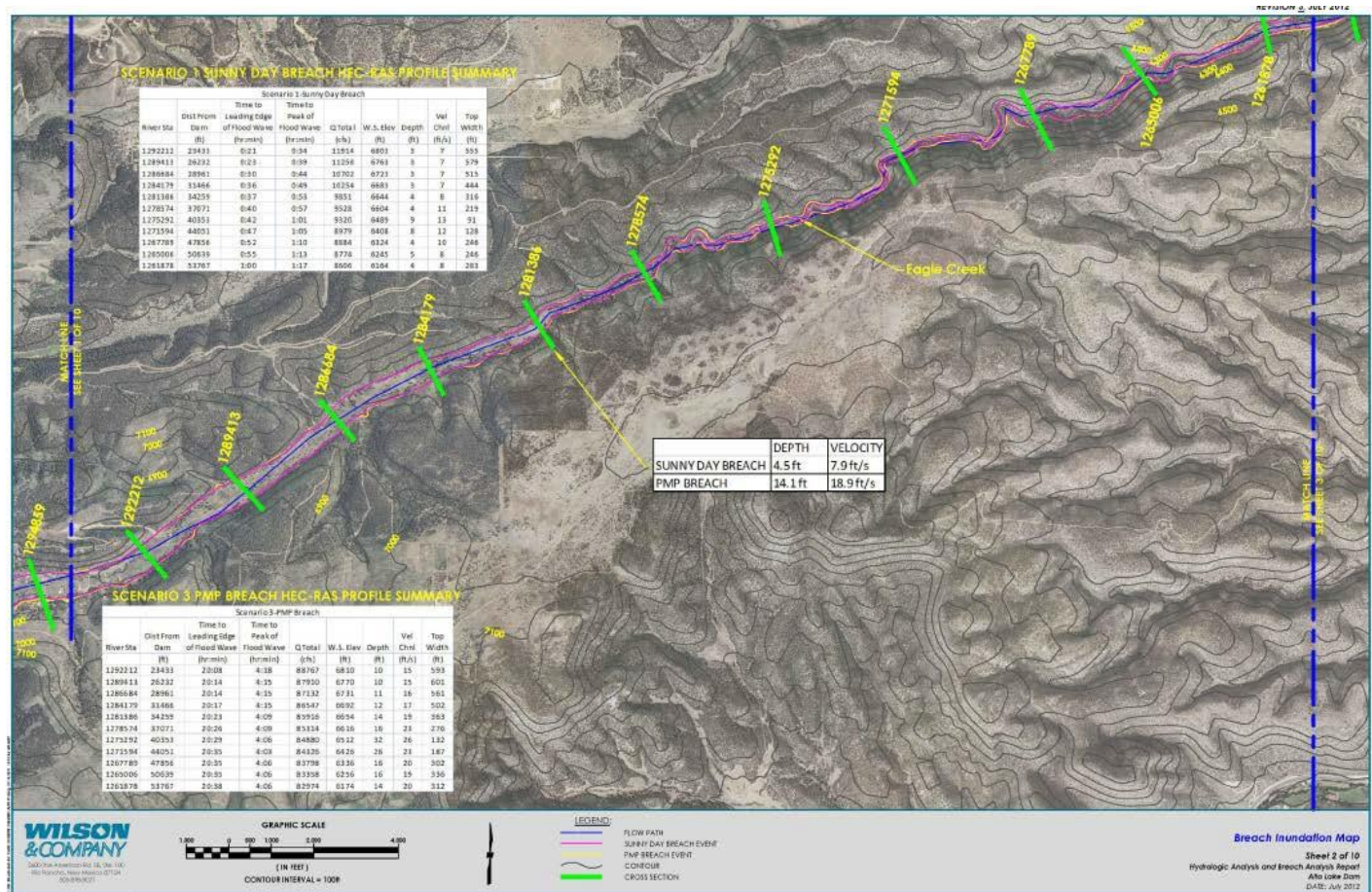
The primary means of communicating with the residents at risk in Lincoln County is through local law enforcement. Local law enforcement personnel contact information is listed in the "Other Emergency Services Contacts" Tab. A reverse 911 system is available in Lincoln County.

Basis for Computation of the Inundation Maps is found in a report prepared by Wilson & Co., and titled "Hydrologic Analysis and Breach Analysis Report for Alto Lake Dam", revised July 2012.

Inundation zones are based solely on flood waters from the watershed above Alto Lake Dam. No contributing tributary flow is considered. Methods, procedures and assumptions used to develop the flooded areas, the limits of the flooding shown and flood wave travel times are approximate and should only be used as a guideline for establishing evacuation zones. Actual areas inundated will depend on the actual failure conditions and may differ from areas shown.









GRINDSTONE

## **Residents/Businesses/Highways at Risk**

A major flood caused by a sudden breach of the dam could inundate multiple residential and commercial structures, as well as local roads, which are shown on the Inundation Maps (see Appendix B-3; Evacuation Map). A brief list of the areas and major roads that may be inundated includes but is not limited to:

### **Locations**

- Potentially-occupied buildings located along the floodplain between the dam and Carrizo Creek, the floodplain of Carrizo Creek between Bewley Lane and the Rio Ruidoso, the floodplain of the Rio Ruidoso between the confluence of Carrizo Creek and the Rio Hondo, and the floodplain of the Rio Hondo from the confluence with the Rio Ruidoso to Two Rivers Dam.

### **Major Road Closings**

- State Highway 37 (north of the Rio Ruidoso to the intersection with U.S. Highway 70)
- U.S. Highway 70 (from the intersection with State Highway 37 to where the highway leaves the Rio Hondo valley)

This list is approximate and may vary pending actual flood conditions. If an emergency situation occurs and requires evacuation, evacuate all residences in the evacuation area according to the Evacuation Map in Appendix B-3.

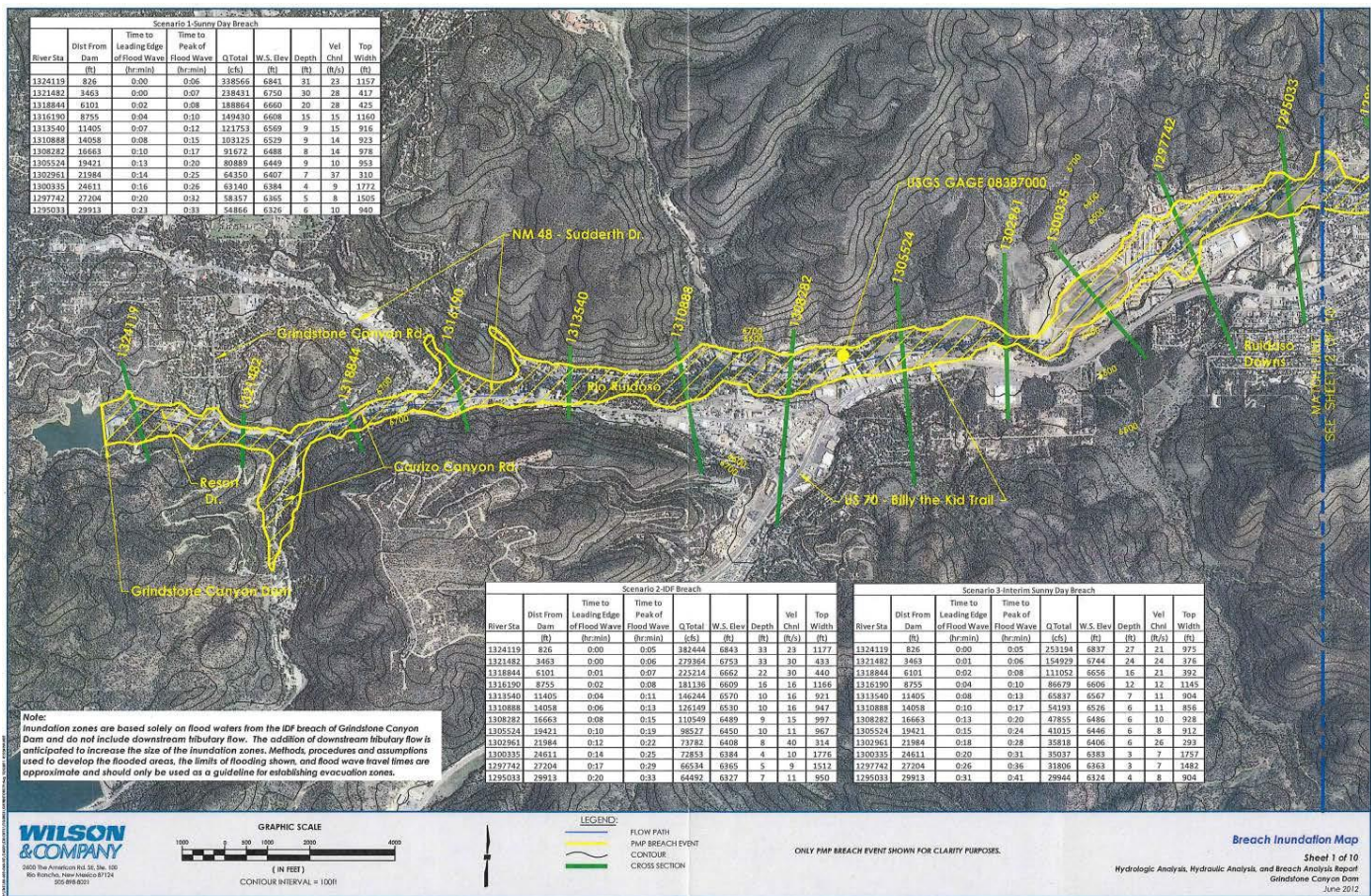
The Local Emergency Official is responsible for initiating evacuation of residents at risk when an emergency situation has been determined.

The primary means of communicating with the residents at risk in Lincoln County is through local law enforcement. Local law enforcement personnel contact information is listed in the "Other Emergency Services Contacts" Tab. A reverse 911 system is available in Lincoln County.

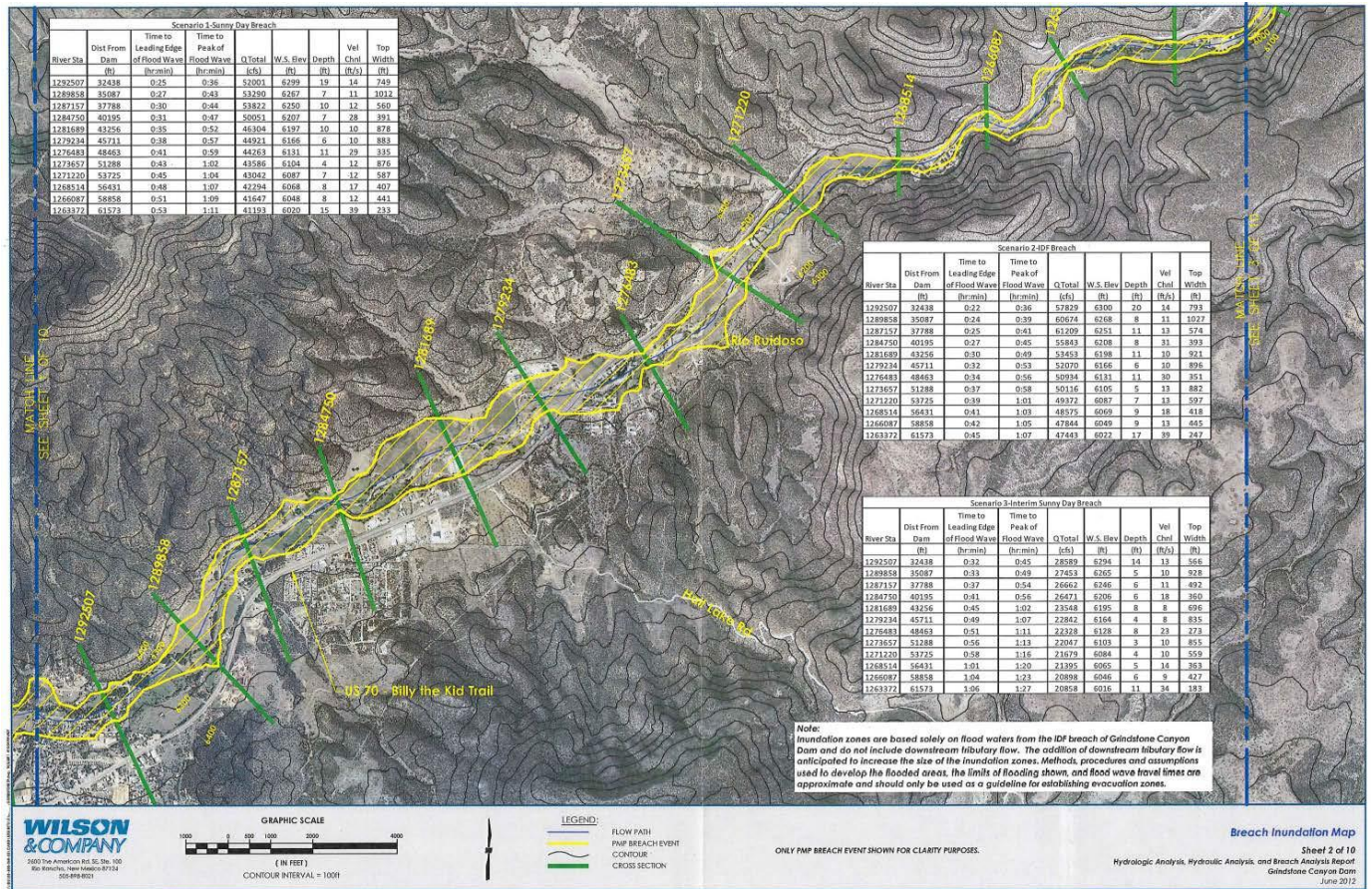
Basis for Computation of the Inundation Maps is found in a report prepared by Wilson & Co., and titled "Hydrologic Analysis, Hydraulic Analysis, and Breach Analysis Report for Grindstone Canyon Dam", dated August 2012.

Inundation zones are based solely on flood waters from the watershed above Grindstone Canyon Dam. No contributing tributary flow is considered. Methods, procedures and assumptions used to develop the flooded areas, the limits of the flooding shown and flood wave travel times are approximate and should only be used as a guideline for establishing evacuation zones. Actual areas inundated will depend on the actual failure conditions and may differ from areas shown.









### **Mescalero Dam**

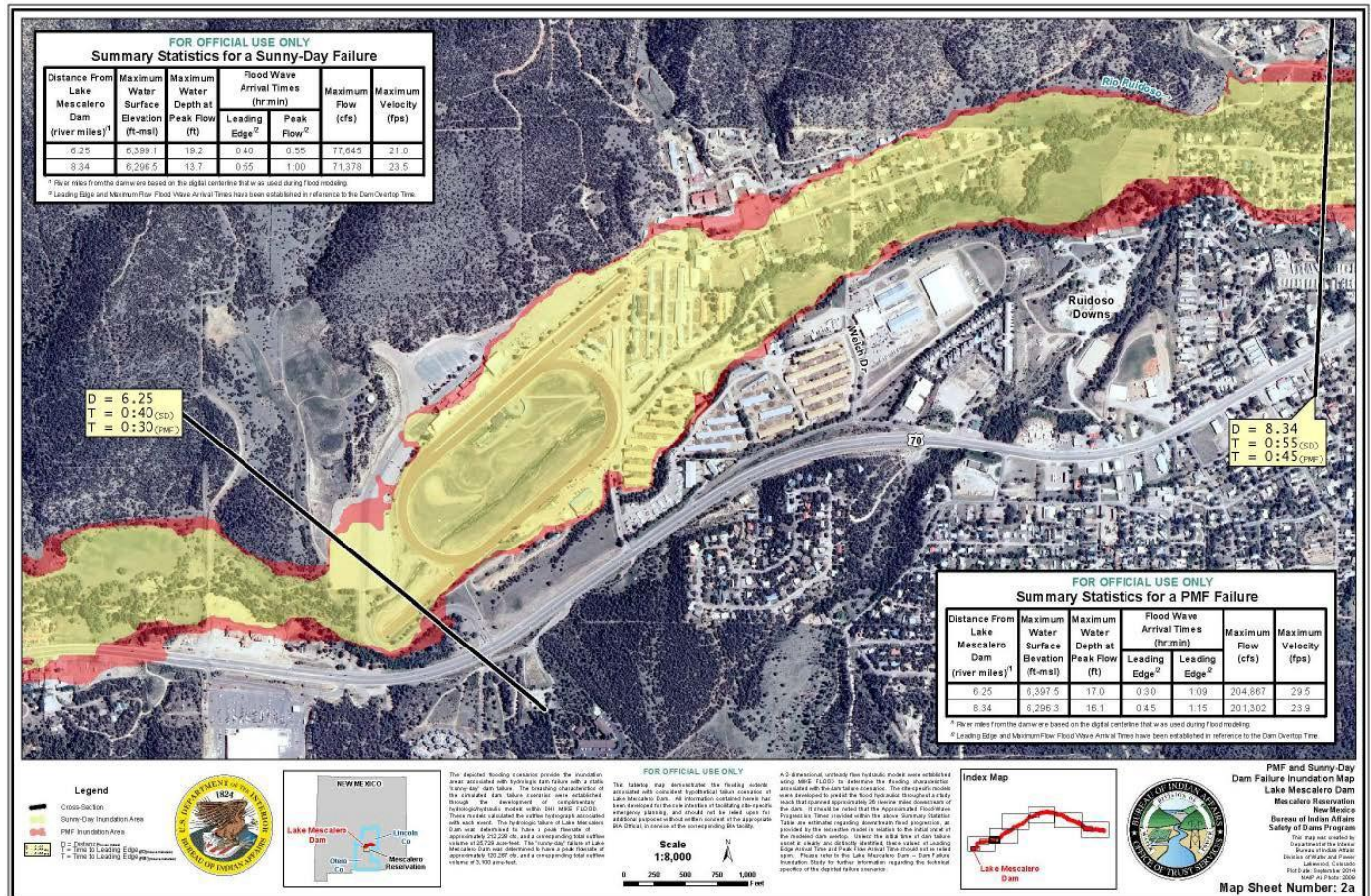
The Dam Failure Inundation Maps on the following pages represent the areas that would be inundated by the Probable Maximum Flood (PMF) and Sunny-Day scenarios.

The following inundation maps and tables have been extracted from the following study:

“Dam Failure Flood Inundation Study Report for Lake Mescalero Dam.”









## **APPENDIX H**

Lincoln County Dams, Rivers, Creeks, and Flood Inundation Maps

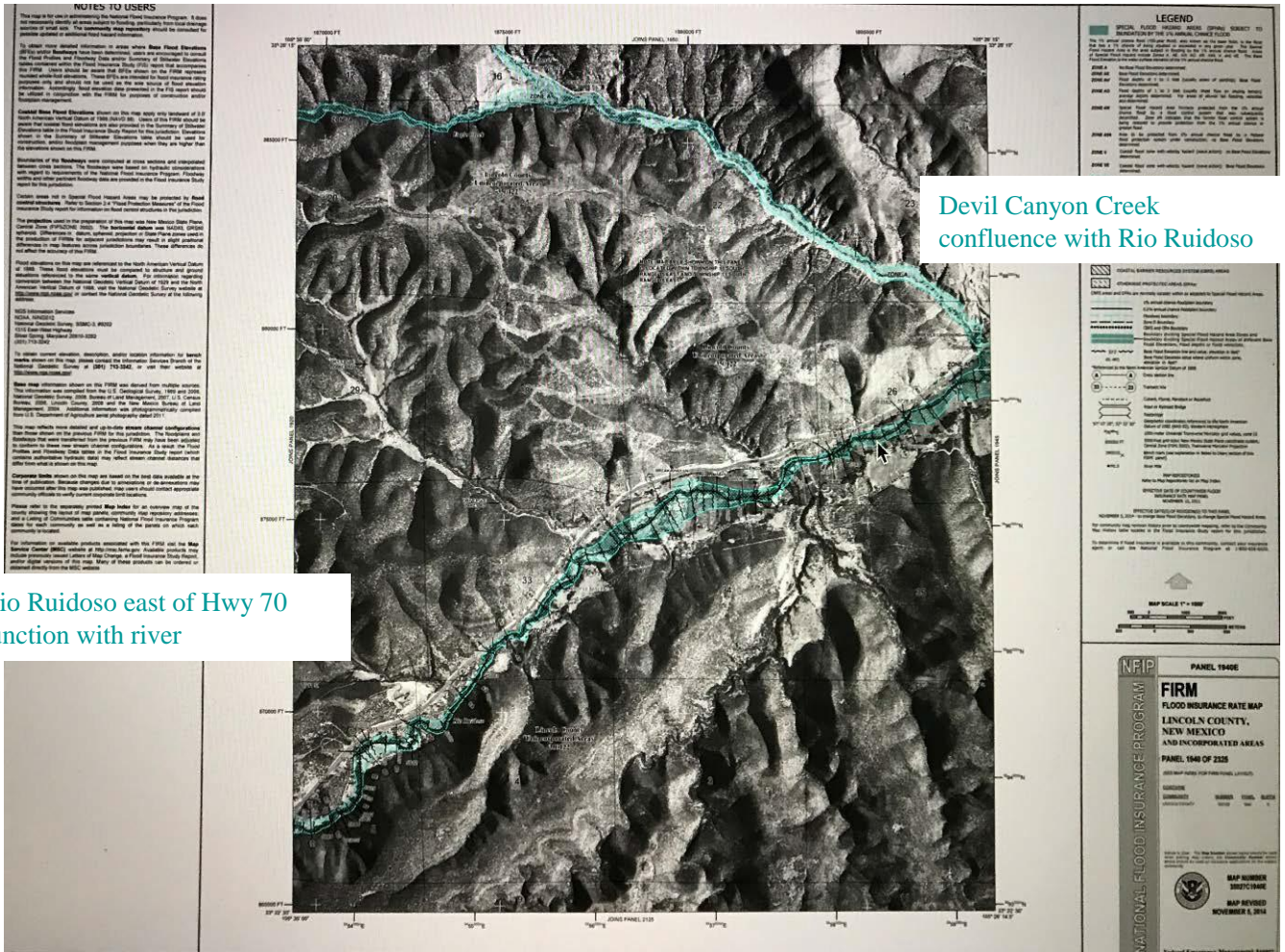




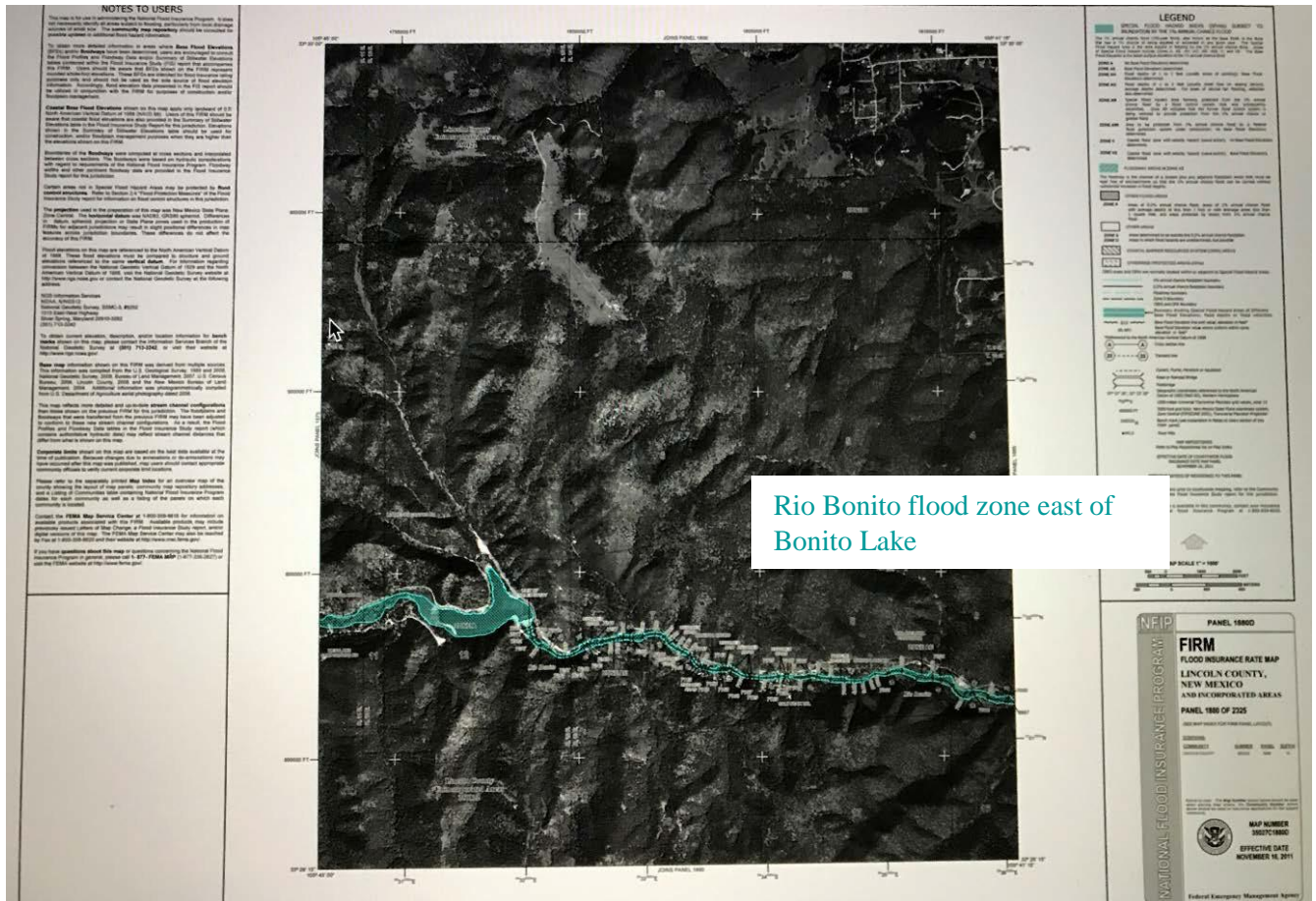




Rio Ruidoso east of Hwy 70  
junction with river



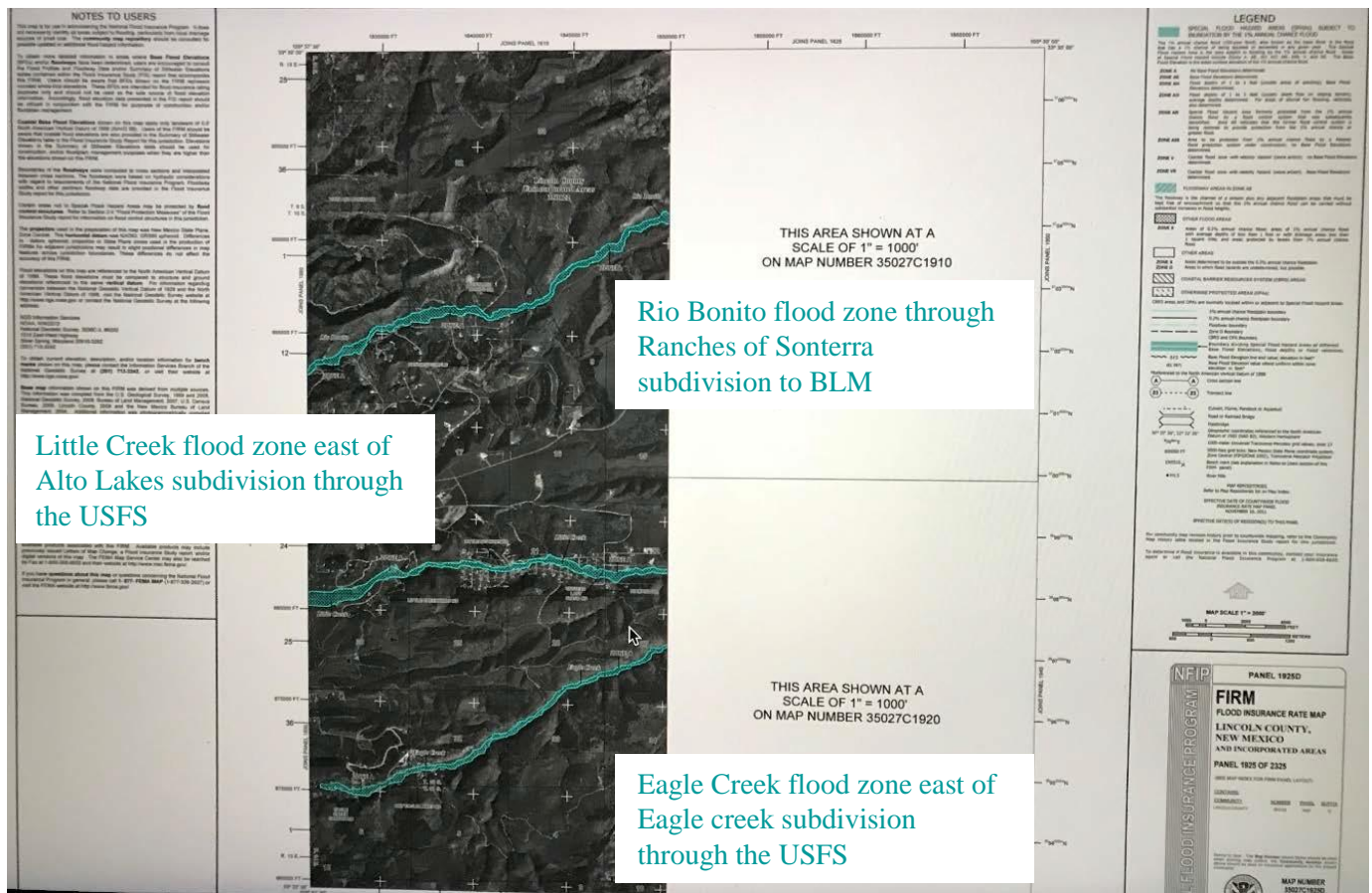
Lincoln County - The flood map below of unincorporated Lincoln County illustrates the inundation from Bonito Lake on the Rio Bonito to the east. The inundation level would reach 10' above the streambed in each direction.





[illegible]

Lincoln County- The flood map below of unincorporated Lincoln County illustrates the inundation from Rio Bonito, Eagle Creek and Little Creek. The inundation levels would reach 10' above the streambed in each direction.





**NOTES TO USERS**

This map is a Flood Hazard Map of Lincoln County, New Mexico, prepared by the Federal Emergency Management Agency (FEMA) for the purpose of determining flood insurance rates. It is not to be used for any other purpose. The map is based on the best available data and is subject to change without notice. The map is not a guarantee of accuracy and is not to be used for any purpose other than for determining flood insurance rates.

**Legend**

**GREEN FLOOD HAZARD AREAS**

1. Areas of special flood hazard which are subject to flooding by the action of waves from hurricanes and other storms. The map is based on the best available data and is subject to change without notice. The map is not a guarantee of accuracy and is not to be used for any purpose other than for determining flood insurance rates.

**YELLOW FLOOD HAZARD AREAS**

2. Areas of special flood hazard which are subject to flooding by the action of waves from hurricanes and other storms. The map is based on the best available data and is subject to change without notice. The map is not a guarantee of accuracy and is not to be used for any purpose other than for determining flood insurance rates.

**Map Scale**

1" = 100'

**Map Number**

38027C0000

**Effective Date**

NOVEMBER 10, 2010

Cedar Creek flood zone southeast through the USFS to the Village of Ruidoso limits to the confluence with the Rio Ruidoso.

[illegible]

Cedar Creek flood zone south to the confluence with the Rio Ruidoso.

## Carrizo Creek flood zone east of Grindstone canyon to the confluence with the Rio Ruidoso





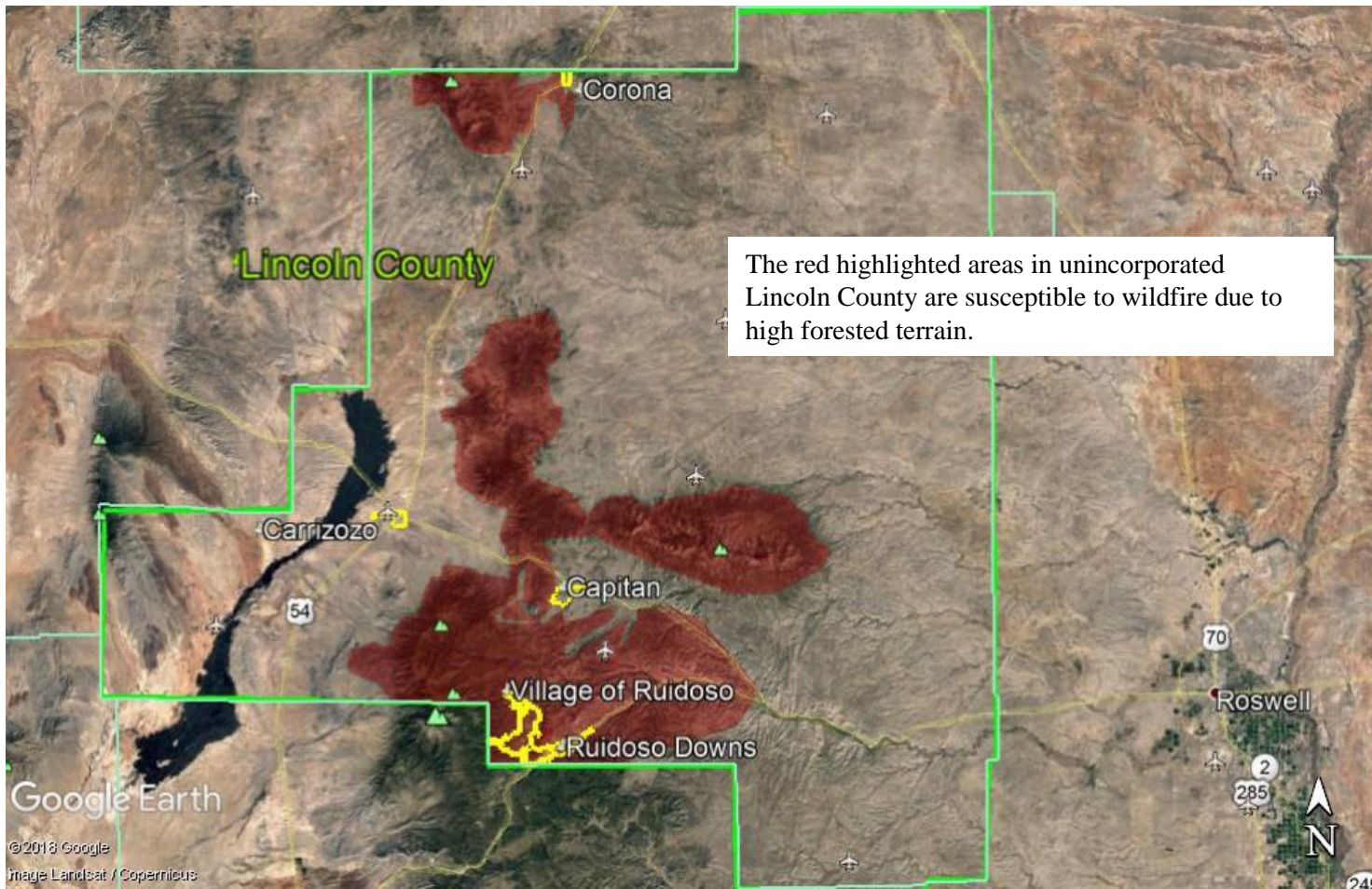
[illegible]

## **APPENDIX I**

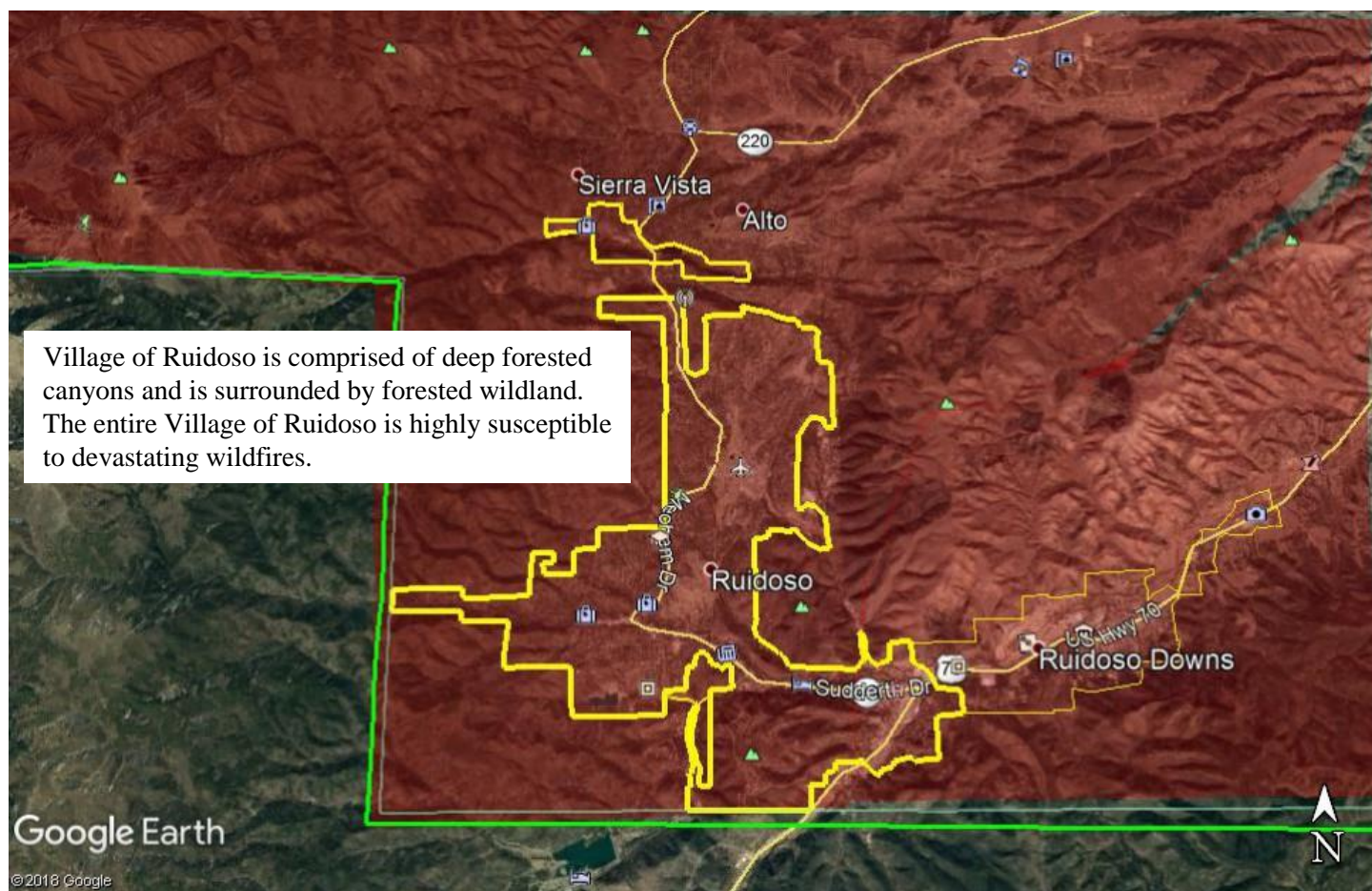
### **Wildfire Susceptibility Base Maps**



Lincoln County – Wildfire susceptibility highlighted in red. Per Figure 5-1 on page 43, the wildfire index, the magnitude for wildfire in Lincoln County is anticipated to range from the lowest intensity to the highest intensity (1-5).



Village of Ruidoso – Wildfire susceptibility highlighted in red. Per Figure 5-1 on page 43, the wildfire index, the magnitude for any wildfire in VOR is anticipated to range in the higher level of intensity,(3-5).

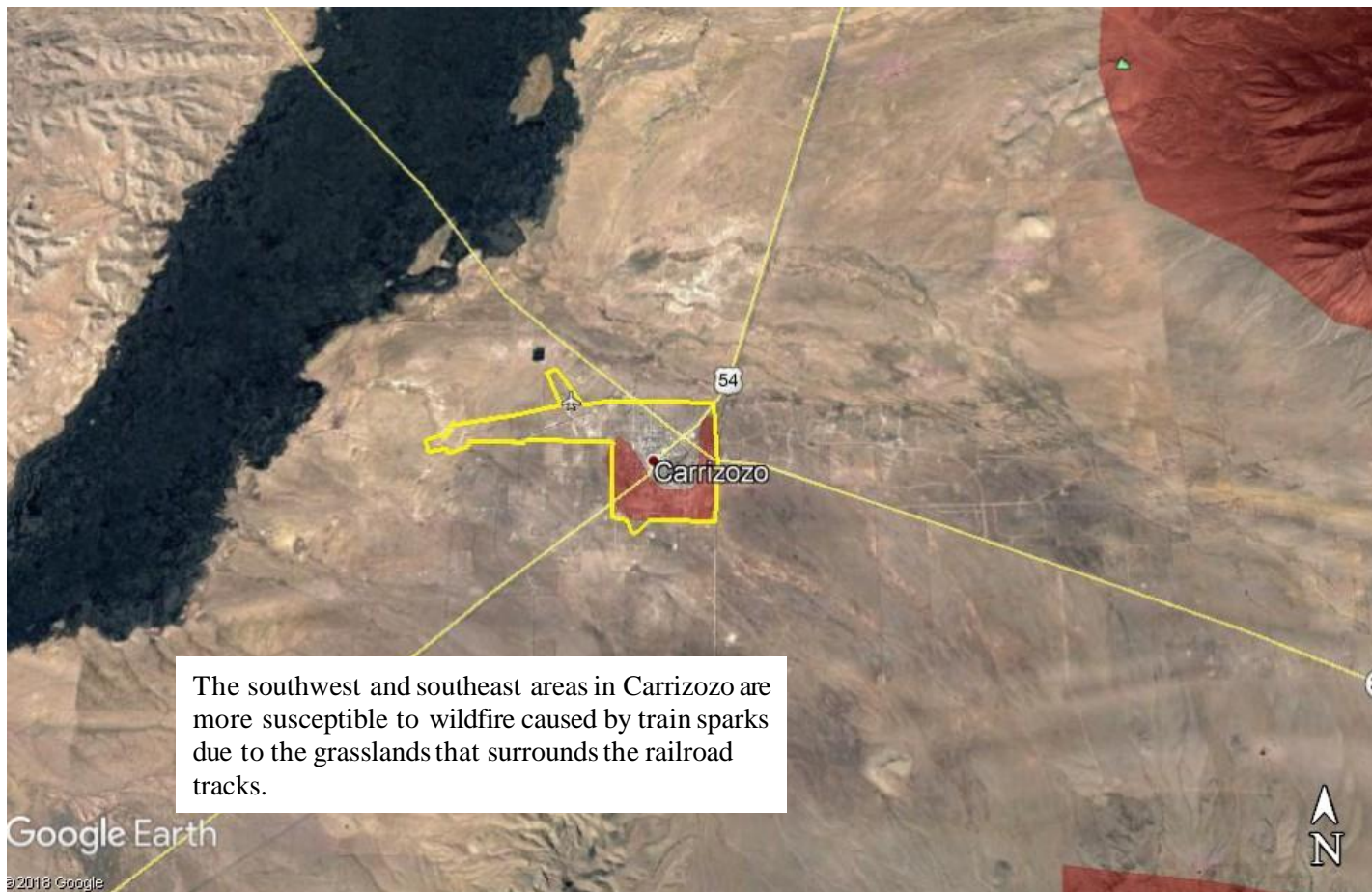




City of Ruidoso Downs - Wildfire susceptibility highlighted in red. Per Figure 5-1 on page 43, the magnitude for wildfire in the City of Ruidoso Downs is anticipated to range in the higher level of intensity (3-5).

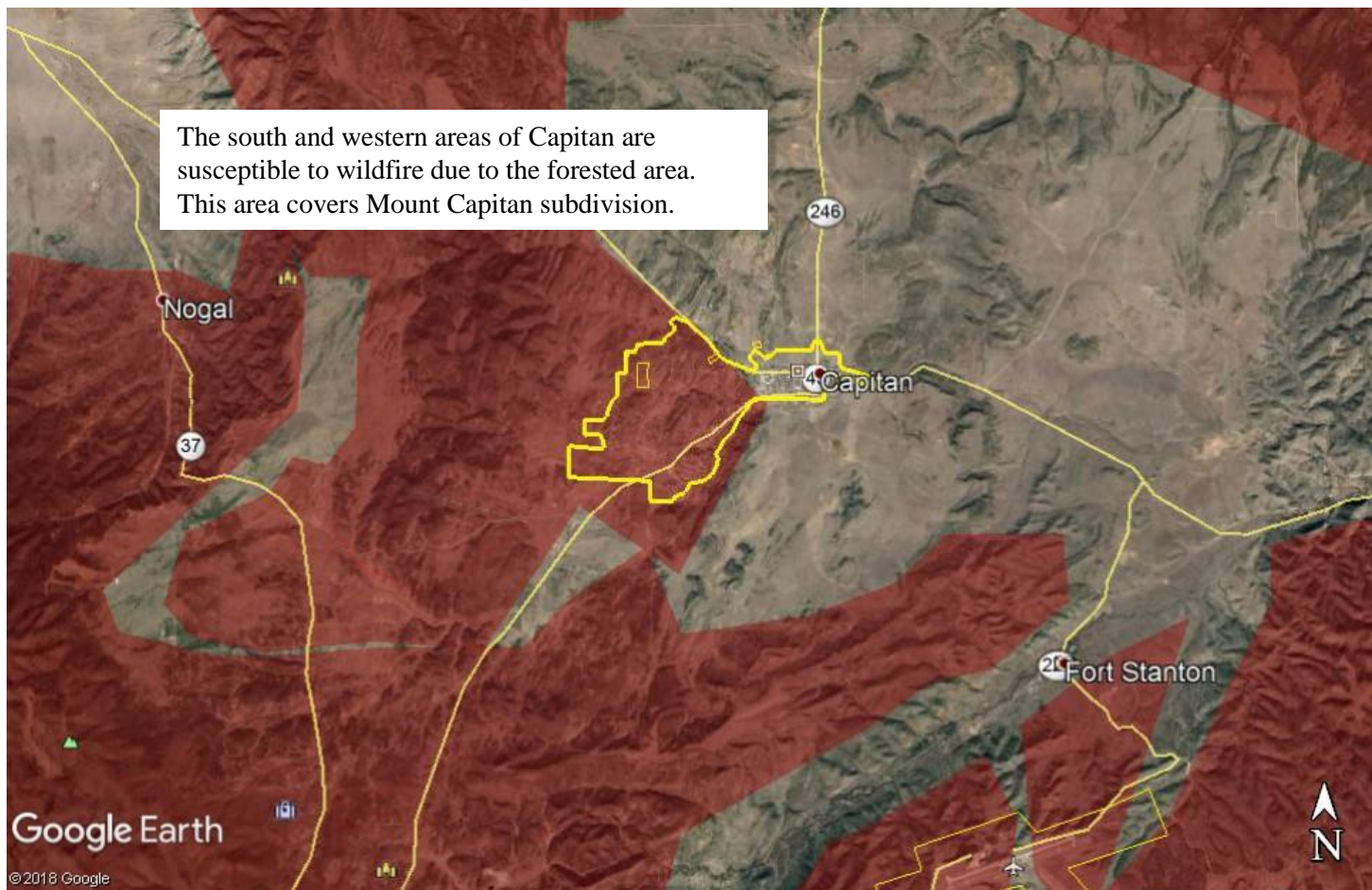


Town of Carrizozo – Wildfire susceptibility highlighted in red. Per Figure 5-1, the wildfire index, the magnitude for wildfire in Carrizozo is anticipated to range from the lowest intensity to the highest intensity (1-5).





Village of Capitan – Wildfire susceptibility highlighted in red. Per Figure 5-1 on page 43, the wildfire index, the magnitude for wildfire in Capitan is anticipated to range from the lowest intensity to the highest intensity (1-5).



Village of Corona – Wildfire susceptibility highlighted in red. Per Figure 5-1 on page 43, the magnitude for wildfire in Corona is anticipated to range from the lowest intensity to high intensity (1-4).

