

**FINAL**



January 2008

# Mendocino County Multi-Hazard Mitigation Plan

Meeting the DMA 2000 and FMA  
local plan requirements

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## Acronyms/Abbreviations

CBC	California Building Code
CDF	California Department of Forestry and Fire Protection
CFR	Code of Federal Regulations
CRS	Community Rating System
DMA 2000	Disaster Mitigation Act of 2000
DOT	U.S. Department of Transportation
DSOD	California Division of Safety of Dams
EHS	Extremely Hazardous Substance
EIR	Environmental Impact Report
EPA	U.S. Environmental Protection Agency

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EPCRA	Emergency Planning and Community Right to Know Act of 1986
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMA	Flood Mitigation Assistance
GIS	Geographic Information System
HMGP	Hazard Mitigation Grant Program
MHMP	Multi-Hazard Mitigation Plan
MM	Modified Mercalli
NFIP	National Flood Insurance Program
NGO	nongovernmental organizations
OES	(Mendocino County) Office of Emergency Services
PDM	Pre-Disaster Mitigation
PGA	peak ground acceleration
RFC	Repetitive Flood Claims
RL	Repetitive Loss
SRL	Severe Repetitive Loss
Stafford Act	Robert T. Stafford Disaster Relief and Emergency Assistance Act
STAPLEE	Social, Technical, Administrative, Political, Legal, Economic, and Environmental
URS	URS Corporation
USC	United States Code
WUI	Wildland-Urban Interface

This section provides a brief introduction to hazard mitigation planning, Local Mitigation Plan and Flood Mitigation Plan requirements, the grants associated with these requirements, and a description of this Multi-Hazard Mitigation Plan (MHMP).

## **1.1 HAZARD MITIGATION PLANNING**

Hazard mitigation, as defined in Title 44 of the Code of Federal Regulations (CFR), Subpart M, Section 206.401, is “any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.” In California, the Governor’s Office of Emergency Services, has expanded this definition to also include human-caused hazards. As such, hazard mitigation is any work done to minimize the impacts of any type of hazard event before it occurs. It aims to reduce losses from future disasters. Hazard mitigation is a process in which hazards are identified and profiled, people and facilities at risk are analyzed, and mitigation actions are developed. The implementation of the mitigation actions, which include long-term strategies that may include planning, policy changes, programs, projects, and other activities, is the end result of this process.

## **1.2 PLANNING REQUIREMENTS**

### **1.2.1 Local Mitigation Plans**

In recent years, local hazard mitigation planning has been driven by a new Federal law. On October 30, 2000, Congress passed the Disaster Mitigation Act of 2000 (DMA 2000) (P.L. 106-390) which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) (Title 42 of the United States Code [USC] 5121 et seq.) by repealing the act’s previous mitigation planning section (409) and replacing it with a new mitigation planning section (322). This new section emphasized the need for State, Tribal, and local entities to closely coordinate mitigation planning and implementation efforts. In addition, it provided the legal basis for the Federal Emergency Management Agency’s (FEMA) mitigation plan requirements for mitigation grant assistance.

To implement these planning requirements, FEMA published an Interim Final Rule in the *Federal Register* on February 26, 2002 (FEMA 2002a), 44 CFR Part 201. The planning requirements for local entities are described in detail in Section 2 and are identified in their appropriate sections throughout this MHMP. The FEMA crosswalk, which documents compliance with 44 CFR, is provided in Appendix A.

### **1.2.2 Flood Mitigation Plans**

In addition to meeting the Local Mitigation Plan requirements of the DMA 2000, this plan also addresses the Local Flood Mitigation Plan requirements of the Flood Mitigation Assistance (FMA) grant program. The FMA grant program was created pursuant to Section 1366 of the National Flood Insurance Act of 1968, 42 USC 4104c, as amended by the National Flood Insurance Reform Act of 1994, Public Law 103-325, and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, Public Law 108-264. The goal of the FMA grant program is to reduce or eliminate flood insurance claims under the National Flood Insurance Program

(NFIP). Particular emphasis for this program is placed on mitigating Repetitive Loss (RL) properties.

Similar to the DMA 2000, States, Tribes, and local entities must have a FEMA-approved Flood Mitigation Plan or a Local Mitigation Plan that meets the requirements of the FMA planning requirements, which are outlined in 44 CFR 78.5 and 78.6, to be eligible for FMA project funding. Similar to the DMA 2000 requirements, the Flood Mitigation Plan requirements are described in detail in Section 2 and in their appropriate sections throughout this MHMP. In addition, the FEMA crosswalk, which documents compliance with 44 CFR for both the Local Mitigation Plan and the Flood Mitigation Plan requirements, is provided in Appendix A.

### 1.3 GRANT PROGRAMS WITH MITIGATION PLAN REQUIREMENTS

Currently five FEMA grant programs provide funding to States, Tribes, and local entities that have a FEMA-approved State or Local Mitigation Plan and to local entities that have a FEMA-approved Local Mitigation Plan with a flood annex or a stand-alone Flood Mitigation Plan. Two of the grants are authorized under the Stafford Act and DMA 2000, while the remaining three are authorized under the National Flood Insurance Act and the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act.

#### 1.3.1 Stafford Act Grant Programs

The following grant programs require a State, Tribe, or local entity to have a FEMA-approved State or Local Mitigation Plan.

**Hazard Mitigation Grant Program (HMGP):** HMGP provides grants to States, Tribes, and local entities to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. Projects must provide a long-term solution to a problem, for example, elevation of a home to reduce the risk of flood damages as opposed to buying sandbags and pumps to fight the flood. In addition, a project's potential savings must be more than the cost of implementing the project. Funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The amount of funding available for the HMGP under a particular disaster declaration is limited. The program may provide a State or Tribe with up to 20 percent of the total disaster grants awarded by FEMA. The cost-share for this grant is 75 percent Federal/25 percent non-Federal.

**Pre-Disaster Mitigation (PDM) Program:** PDM provides funds to State, Tribes, and local entities, including universities, for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. PDM grants are awarded on a nationally competitive basis. Like HMGP funding, a PDM project's potential savings must be more than the cost of implementing the project. In addition, funds may be used to protect either public or private property or to purchase property that has been subjected to, or is in danger of, repetitive damage. The total amount of PDM funding available is appropriated by Congress on an annual basis. In Fiscal Year (FY) 2007, PDM program funding totaled \$100 million. The cost-share for this grant is 75 percent Federal/25 percent non-Federal.

### 1.3.2 National Flood Insurance Act Grant Programs

The following grant programs require a local entity to have a FEMA-approved State or Local Mitigation Plan with a flood annex or a stand-alone Flood Mitigation Plan.

**Flood Mitigation Assistance (FMA) Grant Program:** As noted above, the goal of the FMA grant program is to reduce or eliminate flood insurance claims under the NFIP. Particular emphasis for this program is placed on mitigating RL properties. The primary source of funding for this program is the National Flood Insurance Fund. Grant funding is available for three types of grants, including Planning, Project, and Technical Assistance. Project grants, which use the majority of the program's total funding, are awarded to States, Tribes, and local entities to apply mitigation measures reduce flood losses to properties insured under the NFIP. In FY 2007, FMA funding totaled \$31 million. The cost-share for this grant is 75 percent Federal/25 percent non-Federal. However, 90 percent Federal/10 percent non-Federal to mitigate severe repetitive loss (SRL) properties is available in certain situations.

**Repetitive Flood Claims (RFC) Program:** The RFC program provides funding to reduce or eliminate the long-term risk of flood damage to residential and nonresidential structures insured under the NFIP. Structures considered for mitigation must have had one or more claim payments for flood damages. In FY 2007, Congress appropriated \$10 million for the implementation of this program. All RFC grants are eligible for up to 100 percent Federal assistance.

**Severe Repetitive Loss (SRL) Program:** The SRL program provides funding to reduce or eliminate the long-term risk of flood damage to residential structures insured under the NFIP. Structures considered for mitigation must have at least four NFIP claim payments over \$5,000 each, when at least two such claims have occurred within any 10-year period, and the cumulative amount of such claims payments exceeds \$20,000; or for which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the value of the property, when two such claims have occurred within any 10-year period. Congress has authorized up to \$40 million per year from FY 2005 – FY 2009. The cost-share for this grant is 75 percent Federal/25 percent non-Federal. However, 90 percent Federal/10 percent non-Federal to mitigate SRL properties is available when the State or Tribal plan addresses ways to mitigate SRL properties.

## 1.4 MHMP DESCRIPTION

The remainder of this MHMP consists of the following sections and appendices:

### 1.4.1 Section 2: Prerequisites

Section 2 addresses the prerequisites of plan adoption, which include adoption by the governing body of each participating jurisdiction, including Mendocino County and the cities of Fort Bragg, Point Arena, Ukiah, and Willits. Adoption resolutions for each jurisdiction are included in Appendix B.

### 1.4.2 Section 3: Community Description

Section 3 provides a general history and background of incorporated and unincorporated communities of Mendocino County, including historical trends for population and the

demographic and economic conditions that have shaped the area. Trends in land use and development are also discussed. A location figure of the area is included in Appendix C.

### **1.4.3 Section 4: Planning Process**

Section 4 describes the planning process and identifies the Task Force members, the meetings held as part of the planning process (Appendix D), the URS Corporation (URS) consultants, and the key stakeholders within the county and surrounding region. In addition, this section documents public outreach activities (attached as Appendix E) and the review and incorporation of relevant plans, reports, and other appropriate information.

### **1.4.4 Section 5: Hazard Analysis**

Section 5 describes the process through which the Task Force identified, screened, and selected the hazards to be profiled in this version of the MHMP. The hazard analysis includes the nature, history, location, extent, and probability of future events for each hazard. Extra detail is given to the flood hazard profile, to meet the FMA planning requirements. In addition, historical and location hazard figures are included in Appendix C.

### **1.4.5 Section 6: Vulnerability Analysis**

Section 6 identifies potentially vulnerable assets—people, residential and nonresidential buildings dwelling units, RL properties, critical facilities, and critical infrastructure—in the incorporated and unincorporated county. These data were compiled by assessing the potential impacts from each hazard using Geographic Information System (GIS) information. The resulting information identifies the full range of hazards that the incorporated and unincorporated county could face and potential social impacts, damages, and economic losses.

### **1.4.6 Section 7: Mitigation Strategy**

The mitigation strategy (Section 7) provides a blueprint for reducing the potential losses identified in the vulnerability analysis. The Task Force developed a list of mitigation goals and potential actions to address the risks facing Mendocino County and the four incorporated communities. Mitigation actions include preventive actions, property protection techniques, natural resource protection strategies, structural projects, emergency services, and public information and awareness activities. In addition, mitigation strategies are developed for continued compliance with the NFIP and the reduction of flood damage to flood-prone structures, including any RL property. For the countywide mitigation strategy, the Task Force selected relevant mitigation actions to implement on a countywide level.

County and city-specific mitigation strategies, including capability assessments, are provided in Appendices H through L.

### **1.4.7 Section 8: Plan Maintenance**

Section 8 describes the Task Force’s formal plan maintenance process to ensure that the MHMP remains an active and applicable document. The process includes monitoring, evaluating

(Appendix F), and updating the MHMP (Appendix G); implementation through existing planning mechanisms; and continued public involvement.

#### **1.4.8 Section 9: References**

Section 9 lists the reference materials used to prepare this MHMP.

#### **1.4.9 Appendix A**

Appendix A provides the FEMA crosswalk, which documents compliance with 44 CFR for both the Local Mitigation Plan requirements and the Flood Mitigation Plan requirements.

#### **1.4.10 Appendix B**

Appendix B provides the adoption resolutions for Mendocino County and the cities of Fort Bragg, Point Arena, Ukiah, and Willits.

#### **1.4.11 Appendix C**

Appendix C includes the figures that identify known hazard areas, previous hazard occurrences, and critical assets.

#### **1.4.12 Appendix D**

Appendix D contains the Task Force meeting agendas and handouts.

#### **1.4.13 Appendix E**

Appendix E provides public outreach information, including press releases, information posted on Mendocino County's website, and public workshop material.

#### **1.4.14 Appendix F**

Appendix F contains the Benefit-Cost Analysis Fact Sheet used to select and prioritize mitigation actions.

#### **1.4.15 Appendix G**

Appendix G provides the plan maintenance documents, such as an annual review sheet and the progress report form.

#### **1.4.16 Appendices H through L**

Appendices H through T provide the vulnerability analyses and mitigation strategies, including the capability assessments, for Mendocino County and the cities of Fort Bragg, Point Arena, Ukiah, and Willits.

## 1.4.17 Appendix M

Appendix M includes an electronic version of the MHMP on a CD.

## 2.1 ADOPTION BY LOCAL GOVERNING BODIES AND SUPPORTING DOCUMENTATION

The requirements for the adoption of this MHMP by the participating local governing bodies, as stipulated in the DMA 2000 and its implementing regulations, are described below.

### DMA 2000 and FMA REQUIREMENTS: PREREQUISITES

#### Multi-Jurisdictional Plan Adoption

**Requirement §201.6(c)(5):** For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

**FMA Requirement §78.5(f):** Documentation of formal plan adoption by the legal entity submitting the plan (e.g., Governor, Mayor, County Executive, etc.).

#### Element

- Does the plan indicate the specific jurisdictions represented in the plan?
- For each jurisdiction, has the local governing body adopted the plan?
- Is supporting documentation, such as a resolution, included for each participating jurisdiction?

Source: FEMA, March 2004.

Mendocino County and the cities of Fort Bragg, Point Area, Ukiah, and Willits, are the jurisdictions represented in this MHMP and meet the requirements of Section 409 of the Stafford Act and Section 322 of the DMA 2000.

The local governing body of Mendocino County and each incorporated community has adopted the MHMP by resolution. A scanned copy of each resolution is included in Appendix B.

This section describes the location, geography, and history; demographics; and land use development trends of Mendocino County and its four incorporated communities.

### **3.1 LOCATION, GEOGRAPHY, AND HISTORY**

Mendocino County is located along the coast of Northern California. It is bounded by Humboldt and Trinity counties to the north; Tehama, Glenn, and Lake counties to the East; Sonoma County to the south; and the Pacific Ocean to the west. At its northernmost point, the county lies 176 miles from San Francisco. At its southernmost boundary, the county is 437 miles from Los Angeles. The county occupies 3,510 square miles (2,246,000 acres) and has some 129 miles of coastline. Elevations in the county run from sea level at the Pacific Ocean to 6,954 feet atop Anthony Peak to the northeast.

Mendocino County's climate is generally mild and can be characterized by moist cool winters and warm dry summers. Inland temperature extremes range from lows of 5 degrees Fahrenheit to highs over 110 degrees Fahrenheit, while coastal areas experience less extreme temperatures ranging from 20 to 80 degrees Fahrenheit.

Mendocino County derives its name from Cape Mendocino (which is north of the county in Humboldt County). Cape Mendocino was named by 16<sup>th</sup> century Spanish navigator Juan Rodriguez Cabrillo. Cabrillo discovered Cape Mendocino in 1542 while on a voyage of discovery along the Pacific Coast and named it in honor of Don Antonio de Mendoza, the first Viceroy of New Spain (Mendocino is the adjectival form of the family name Mendoza). The first permanent Spanish settlers came to the area in the middle 16<sup>th</sup> century. The first permanent non-Spanish settlements were established along the Pacific coast north of the Big River in April 1852.

Mendocino County was one of California's original 27 counties, established in 1850 by the California State Legislature. It was administered by the government of Sonoma County until 1859, when Mendocino County established its own government in the city of Ukiah.

In that same year, tensions between the estimated 10,000 Native Americans long-established in the area and White settlers culminated in what the State legislature deemed the "Mendocino War." The Mendocino War resulted in the segregation of many Native Americans to reservations that still exist within the unincorporated county, including the Federally recognized Round Valley Indian Reservation, part of which extends north from Mendocino County into California's Trinity County.

Today, Mendocino County includes 4 incorporated cities (Fort Bragg, Point Arena, Ukiah, and Willits) and several small unincorporated communities. The county's unincorporated communities include Albion, Anchor Bay, Brooktrails, Boonville, Branscomb, Calpella, Caspar, Comptche, Covelo, Dos Rios, Elk, Hopland, Laytonville, Legget, Little River, Manchester, Mendocino, Navarro, Philo, Piercy, Potter Valley, Redwood Valley, Talmage, Westport, and Yorkville.

### **3.2 DEMOGRAPHICS**

According to the U.S. Census Bureau (U.S. Census), Mendocino County's population, including incorporated cities, was 86,265 in the year 2000. In 2000, approximately 6 percent of the

county's population was under the age of 5, 81.5 percent was between 18 and 64 years old, and 13.5 percent was over the age of 65. The U.S. Census estimates the 2006 population of the county to be 86,850.

In 2000, the entire county's labor force (defined as members of the population over 16 years) was recorded by the U.S. Census as 41,655 (some 62 percent). The median household income in 1999 was recorded as \$35,996 (for the U.S. as a whole that figure is \$41,994), while the median family income for the same year was recorded as \$42,168 (\$50,994 nationwide). In 2000, 13,505 individuals, or 16 percent of the county residents were living below the poverty level, compared with 12 percent nationwide. The county's per capita income in 1999 was \$19,443, while that for the U.S. was \$21,587.

In 2006, the median household income was estimated to be \$39,705 and the median family income was estimated to be \$43,487. Mendocino County's per capita income was estimated to be \$21,555 that same year. Ten percent of families and 17 percent of all people were estimated by the U.S. Census to be living below the poverty level in the county in 2006 (estimates for the percentage of households sustained below the poverty line are unavailable for 2006).

According to the U.S. Census, Mendocino County's 2006 labor force was 71,110, which is approximately 82 percent of people eligible for the labor force (that is, individuals 16 years or older). The 2006 unemployment rate for the incorporated and unincorporated county was 6 percent. In 2006, the leading industries in the county were educational services, health care, and social assistance (roughly 18 percent of the labor force); retail trade (roughly 15 percent of the labor force); and arts, entertainment, and recreation, and accommodation, and food services (roughly 13 percent). These figures stand in stark contrast to the county's labor trends in the late seventies, when at least 30 percent of total employment was directly dependent on agriculture, forestry, the fishing industry, and wood and food processing sectors of the manufacturing industry.

### 3.2.1 Mendocino County

Between 1990 and 2000, unincorporated Mendocino County absorbed 67 percent of the county's growth. The unincorporated county's housing stock increased from 23,018 to 25,517 units from 1990 to 2000. Multifamily homes comprised only 6 percent of that growth. Mendocino County Planning Department predicts that between 2001 and 2008, 3,391 new housing units will be needed in the unincorporated county. While the median income increased 30 percent from 1990 and 2000, housing values increased 37 percent and rents increased 27 percent. In the unincorporated county, the number of vacant residential parcels zoned for less than 1 acre is limited in most areas, except in the Brooktrails Township, and to a much lesser extent in the Ukiah Valley. The Brooktrails Township remains virtually the only area with parcels zoned for multifamily housing uses without a use permit.

Between 1990 and 2000, approximately 41 percent of residents in unincorporated areas had low or very-low incomes. In 2002, the maximum affordable housing cost (meaning not more 30 percent of total income) for a four-person low-income family was \$56,429 for owner-occupied units and \$481 for renter-occupied units. Thirty-six percent of renter households and 25 percent of owner households spent more than 30 percent of their income on housing costs. According to Mendocino County Planning Department, between 2001 and 2008 3,391 new units are needed in

the unincorporated county and 1,391 units (41 percent) should be affordable to low or very low income households.

### 3.2.2 City of Fort Bragg

The City of Fort Bragg (Fort Bragg) lies on the central coast of Mendocino County. According to the U.S. Census, Fort Bragg had a population of 7,026 in 2000. Seven percent of Fort Bragg's population was under 5 years of age in 2000, with 75 percent between the ages of 18 and 65, and 14 percent over 65. Of Fort Bragg's 5,501 residents eligible for the labor force in 2000, 3,433 residents were employed. Fort Bragg's unemployment rate in 2000 was 5.3 percent. The median household income in Fort Bragg in 1999 was \$28,539. The median family income for the same year was \$36,000. Fort Bragg's per capita income in 1999 was \$15,832. Twelve percent of families and 20 percent of individuals in Fort Bragg were living below the poverty level in 2000.

### 3.2.3 City of Point Arena

The City of Point Arena (Point Arena) is located some 13 miles north of the county's southern border (shared with Sonoma County). Point Arena's total population in 2000 was 474. According to the 2000 U.S. Census, 8 percent of Point Arena's population is under 5 years of age, 67 percent are between the ages of 17 and 65 years old, and 9 percent of the population is 65 years or older. Of the 334 (some 70 percent) residents of Point Arena eligible for the labor force, 263 are employed. Point Arena's unemployment rate is 2.1 percent. In 1999, the median household income in Point Arena was \$27,083 and the median family income was \$32,885. Point Arena's per capita income in 1999 was \$12,591. 24 percent of Point Arena's families were living below the poverty level in 2000. In that same year, 26 percent of individuals were also living below the poverty level.

### 3.2.4 City of Ukiah

The City of Ukiah (Ukiah) is the Mendocino County Seat and is located 25 miles north of the county's border with Sonoma County on State Route 101. Of a population of 15,497 individuals, 7 percent was under 5 years of age in 2000. In that same year, 74 percent of the population was between 17 and 65 years of age, and 14 percent was 65 or older. Ukiah's labor force numbered 7,124 in 2000 (61 percent of the city's population). Of these individuals, 6,572 are employed. Ukiah's unemployment rate was some 4.5 percent in 2000. Ukiah's median household income in 1999 was \$32,707. The median family income for the same year was \$39,524 and its per capita income was \$17,601. 474 families (13.2 percent) and 2,624 individuals in Ukiah were living below the poverty level in 2000.

### 3.2.5 City of Willits

Located in central Mendocino County (along U.S. Highway 101), the City of Willits (Willits) had a population of 5,073 people according to the 2000 U.S. Census. 7.4 percent of Willits' population was under the age of 5, 71 percent was between 17 and 65 years of age, and 14 percent was 65 years or older. Of a labor force of 2,411 people, 2,244 of Willits' residents are employed. Ukiah's unemployment rate was 6.9 percent in 2000. Willits' median household income in 1999 was \$26,283 and its median family income was \$36,913. Per capita income in

Willits in 1999 was \$16,642. In 2000, 12 percent of families and 15 percent of individuals in Willits were living below the poverty level.

### **3.3 LAND USE AND DEVELOPMENT TRENDS**

Mendocino County Board of Supervisors adopted its first zoning ordinance in 1956 and the county's first Land Use Ordinance was adopted in 1967. Between 1967 and 1977, the county adopted its General Plan as a collection of elements. In 1978, the county approved several tentative subdivision maps. Lawsuits were soon brought against the county alleging that the General Plan was inadequate. The Court of Appeals found that the Land Use Element along with the Circulation, Housing, and Noise Elements of the General Plan were deficient.

As a result of this decision, the county undertook and adopted a comprehensive update of the General Plan in 1981. The Plan includes a Land Use Element, a Housing Element (including a Housing Plan and Technical Appendix), a Circulation Element, a Safety Element, a Seismic Element, a Noise Element, a Recreation Element, an Open Space and Conservation Element, a Scenic Highways Element, and a Coastal Element. Since 1981, only minor amendments to the General Plan have been adopted, aside from a mandated revision of the Housing Element in 1993 and 2004. Additional plans adopted by the county include a Mendocino Town Plan, a Gualala Town Plan, and a Brooktrails Specific Plan.

Mendocino County is currently updating the county's General Plan. As of November 2007, the Plan was under staff review. The Final Plan is scheduled to be distributed in October of 2008 and to be adopted by the end of 2008. In addition to preparing a new General Plan, the county is also in process of preparing a General Plan Environmental Impact Report (EIR). The county began the EIR preparation process in May of 2007. The Final EIR is scheduled to be certified by December of 2008.

Sixteen percent of the land in Mendocino County is under ownership of Federal agencies, the U.S. Forest Service, the Bureau of Land Management, and Indian Reservations/Rancherias. Four percent of land in Mendocino is under the jurisdiction of State, county, and city agencies. The majority of land within the county is under private ownership (79 percent). Of that land, 26 percent is committed to Agricultural Preserves, 47 percent is designated as Timber Production Zones, and 27 percent is categorized for other uses.

Historically, most towns in Mendocino County were located along streams or rivers for access to a dependable water supply. Early development patterns were dispersed, reflecting the county's timber and agricultural resources. Communities and economies focused on the timber industry included Willits, Fort Bragg, Mendocino, Covelo, and Philo. The timber industry has been undergoing a steady decline since the 1950s, with closures of many lumber mills throughout the county. This trend continues today.

Many communities have also developed around agriculture and related industries. Some areas were devoted to orchards and fruit bearing trees, while others focused on cattle raising and ranching. Many of the county's smaller valleys have experienced conversion of many orchards to vineyards and related enterprises. Agricultural areas along the South Coast have primarily been devoted to dairies and sheep farming. In the 1960s, the improvement of State Route 101 to a four lane segment fragmented many orchards in the Ukiah Valley, contributing to the conversion of agricultural lands to urban uses.

During the 1980s and 1990s, a number of major subdivisions were developed in the Ukiah Valley. The net annual average of parcels created between 1981 and 1989 (142) decreased to 70 per year between 1990 and 2001. Data of building permits issued between 1991 and 2001 show that the greatest commercial development in the county occurred in the Fort Bragg and Ukiah Valley areas, followed by the community of Mendocino and in area along the South Coast. Between 1991 and 2001 the Ukiah Valley exceeded the industrial valuation of all other areas combined.

This section provides an overview of the planning process; identifies the Task Force members and key stakeholders; documents public outreach efforts; and summarizes the review and incorporation of existing plans, studies, and reports used to develop this MHMP. Additional information regarding the Task Force and public outreach efforts is provided in Appendices D and E.

The requirements for the planning process, as stipulated in DMA 2000 and its implementing regulations, are described below.

#### DMA 2000 and FMA Requirements: Planning Process

##### Multi-Jurisdictional Planning Participation

**Requirement §201.6(a)(3):** Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process ... Statewide plans will not be accepted as multi-jurisdictional plans.

**FMA Requirement §78.5(a):** Description of the planning process and public involvement. Public involvement may include workshops, public meetings & hearings.

##### Element

- Does the plan describe how each jurisdiction participated in the plan's development?

##### Planning Process

**Requirement §201.6(b):** An open public involvement process is essential to the development of an effective plan.

##### Documentation of the Planning Process

**Requirement §201.6(b):** In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

**FMA Requirement §78.5(a):** Description of the planning process and public involvement. Public involvement may include workshops, public meetings & hearings.

##### Element

- An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- 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 nonprofit interests to be involved in the planning process; and
- Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

**Requirement §201.6(c)(1):** [The plan shall document] 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.

##### Element

- Does the plan provide a narrative description of the process followed to prepare the plan?
- Does the plan indicate who was involved in the planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, etc.?)
- Does the plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)
- Was there an opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?
- Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?

Source: FEMA, March 2004.

## 4.1 OVERVIEW OF PLANNING PROCESS

Mendocino County Office of Emergency Services (OES) hired URS to assist with the development of this MHMP. The first step in the planning process was to establish a Task Force, which consisted of the county and city representatives as well as nongovernmental organizations (NGOs) including the Red Cross, Mendocino Fire Safe Council, and Mendocino County Community Emergency Response Team. Bill Woodworth of Mendocino County OES served as the primary point of contact for the Task Force and the public.

Once the Task Force was formed, the following six-step planning process took place during the 7-month period from June 2007 to January 2008.

- **Organize resources:** The Task Force identified resources, including county staff, city departments and agencies, and local NGOs, which could provide the technical expertise and historical information needed to develop the MHMP.
- **Profile Hazards:** The Task Force identified the hazards specific to Mendocino County and the cities of Fort Bragg, Point Arena, Ukiah, and Willits, and URS developed a hazard analysis for these eight hazards.
- **Assess Risks:** URS developed a vulnerability analysis for the county and each of the incorporated communities. The county and incorporated communities reviewed the vulnerability analysis results before and during the development of the mitigation strategy.
- **Assess capabilities:** Each member of the Task Force reviewed the current administrative and technical, legal and regulatory, and fiscal capabilities to determine whether existing provisions and requirements adequately address relevant hazards in his/her respective community and organization.
- **Develop a mitigation strategy:** The Task Force developed a comprehensive range of potential mitigation goals and actions. Subsequently, Mendocino County and the incorporated communities identified, evaluated, and prioritized the actions to be implemented in the county- and city-specific Mitigation Action Plans.
- **Monitor progress:** The Task Force developed an implementation process to ensure the success of an ongoing program to minimize hazard impacts to Mendocino County and the incorporated communities.

## 4.2 HAZARD MITIGATION TASK FORCE

### 4.2.1 Formation of the Task Force

As previously noted, the planning process began in June 2007. Bill Woodworth formed the advisory body, known as the Task Force, using staff from relevant local departments, agencies, and NGOs. The Task Force members, which include at least one representative from Mendocino County and each of the county's four incorporated cities, are listed in Table 4-1 and the three meetings held throughout the planning process are described below. In addition, the meeting agendas and handouts are provided in Appendix D.

**Table 4-1 Multi-Hazard Mitigation Plan Task Force**

<b>Name</b>	<b>Community</b>	<b>Agency/Department</b>
Bill Woodworth	Mendocino County	Office of Emergency Services
Julie Rogers	Mendocino County NGO	Mendocino County Fire Safe Council, Inc.
Bob Morgan	Mendocino County	Department of Transportation
Kathleen Dolan	Mendocino County NGO	Red Cross
Rodger Doncaster	Mendocino County NGO	Red Cross
Leif Farr	Mendocino County	Geographical Information System
Howard Dashiell	Mendocino County	Department of Transportation
Raymond Hall	Mendocino County	Planning and Building Services
Linda Ruffing	Fort Bragg	City Manager
Steve Orsi	Fort Bragg	Fire
Cindy VanWormer	Fort Bragg	City Clerk
Nancy Atkinson	Fort Bragg	Engineering
Gerry Gonzalez	Willits	Police
Christine Dektor	Mendocino County NGO	North Coast Opportunities
Tony Clarabut	Ukiah	Fire
Dennis Slota	Mendocino County	Water Agency
Claudia Hillary	Point Arena	City Clerk / Administrator

#### 4.2.2 Planning Team Meetings and Tasks

##### *June 28, 2007*

During the kickoff meeting, URS discussed the objectives of DMA 2000, the hazard mitigation planning process, public outreach opportunities, and mitigation projects and grant funding opportunities. In addition, the presentation included a review of GIS technology as a tool for identifying and mapping known hazards throughout the county. Also discussed was the need for the Task Force to network with other people in Mendocino County, other agencies, and other professionals who might have specialized knowledge about the hazards that could affect the county.

A hazard risk identification exercise was conducted to familiarize the Task Force with the approach and concepts that would be used in the risk identification phase of the MHMP development. Among the 21 potential hazards initially discussed (as shown in Section 5.2), eight hazards were determined to pose the greatest potential risk to the county: dam failure, earthquake, flood (including winter storm), hazardous materials event, landslide, tsunami, urban conflagration, and wildland fire.

*September 13, 2007*

During the second meeting, URS presented the Task Force with the draft hazard figures and explained the data used to develop each figure. Also, each Task Force member reviewed the draft asset information (critical facilities and infrastructure, population, and residential and nonresidential structures) for Mendocino County and the incorporated communities. In addition, URS reviewed the upcoming schedule and introduced the concept of the mitigation strategy.

*October 23, 2007*

During the third Task Force meeting, each member re-reviewed the vulnerability analysis, including county- and city-specific vulnerability analyses information. Next, the Task Force examined and revised the initial list of mitigation goals and potential action items presented. After the Task Force members reviewed the simplified Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLEE) evaluation criteria, the members identified and prioritized the mitigation action items to be included in the Countywide Mitigation Action Plan. Each member of the Task Force took the mitigation strategy handouts back to his/her respective community to review and develop a prioritized list of mitigation actions to be included in his/her community-specific Mitigation Action Plan.

### **4.3 PUBLIC INVOLVEMENT**

#### **4.3.1 Media Release**

On July 10, 2007, shortly after the first Task Force meeting, Mendocino County OES issued a press release regarding the preparation of the MHMP. The press release was sent out in a mass email inviting local, State, and Federal districts and agencies to participate in the planning process. The press release was emailed using the Mendocino County Executive Office's Media List, which included:

- Newspapers: Anderson Valley Advertiser, Fort Bragg Independent Advocate, Independent Coast Observer, Mendocino Beacon, Mendocino County Observer, Press Democrat, Round Valley News, Ukiah Daily Journal, and Willits News
- Radio Stations: KUKI/KLLK/KDAC, KMFB & KPMD, KMUD, KNTI, KQPM, Q1006/KXBX, KOZT, KSAY, KWAN, KWINE, AND KZYY
- Television Stations: KFWU – Channel 8, MCET, Studio 3 Presents, KFTY TV

The press release is included in Appendix E.

#### **4.3.2 Public Comment Draft Period**

Mendocino County OES posted the Public Comment Draft MHMP on its website from December 19 – January 10. During this period, website users could review the plan and provide feedback via email or phone. Mendocino County OES emailed the Mendocino County Executive Office's Media List about the Public Comment Draft MHMP.

A Google cache web snapshot of the Public Comment Draft MHMP included in Appendix E.

### 4.3.3 Coastal and Inland Public Workshops

During the public comment period, Mendocino County OES hosted a public workshop on January 8, 2008, in the City of Willits. Mendocino County residents were notified of this workshop via radio, web, and newspaper announcements. At this workshop, URS conducted a PowerPoint presentation which provided an overview of the planning process, hazards profiled, and mitigation actions selected. In addition, URS displayed poster-sized hazard figures around the room for workshop attendees to review.

## 4.4 INCORPORATION OF EXISTING PLANS AND OTHER RELEVANT INFORMATION

During the planning process, URS reviewed and incorporated information from existing plans, studies, reports, and technical reports into the MHMP. A synopsis of the sources follows.

- *Mendocino County Emergency Operations Plan:* Assisted the Task Force in identifying hazards to select and profile.
- *Mendocino County General Plan:* The Land Use Element provided information on existing land use and future development trends. The Safety Element provided information for the hazard profiles and development of the mitigation strategy for landslides, fire, and flood hazards. The Seismic Safety Element provided information for the hazard profile section and the mitigation strategy for earthquakes and tsunamis.
- *Background Report for the County of Mendocino General Plan Update:* The background report provided an updated synopsis of the hazards profiled in the Safety Element.
- *Mendocino County Zoning Ordinance:* These codes regulate development and land use; they were used to develop the capability assessment and the mitigation strategy.
- *Mendocino County Community Wildfire Protection Plan:* The plan provided historical wildland fire information as well as mitigation projects and programs to include in the MHMP mitigation strategy.
- *State of California Multi-Hazard Mitigation Plan:* This plan, prepared by the California Governor's Office of Emergency Services, was consulted to ensure that the MHMP is consistent with the State hazard mitigation plan.

A complete list of the sources consulted is provided in Section 9.

This section identifies and profiles the hazards that could affect Mendocino County.

## 5.1 OVERVIEW OF A HAZARD ANALYSIS

A hazard analysis includes the identification and screening of each hazard and subsequently the profiling of each hazard. Hazard identification is the process of recognizing the natural and human-caused events that threaten an area. Natural hazards result from unexpected or uncontrollable natural events of sufficient magnitude. Human-caused hazards result from human activity and include technological hazards and terrorism. Technological hazards are generally accidental or result from events with unintended consequences (for example, an accidental hazardous materials release). Terrorism is defined as the calculated use of violence (or threat of violence) to attain goals that are political, religious, or ideological in nature. Even though a particular hazard may not have occurred in recent history in the study area, all hazards that may potentially affect the study area are considered; the hazards that are unlikely to occur or for which the risk of damage is accepted as being very low, are eliminated from consideration.

Hazard profiling is accomplished by describing hazards in terms of their nature, history, magnitude, frequency, location, and probability. Hazards are identified through the collection of historical and anecdotal information, review of existing plans and studies, and preparation of hazard maps of the study area. Hazard maps are used to determine the geographic extent of the hazards and define the approximate boundaries of the areas at risk.

## 5.2 HAZARD IDENTIFICATION AND SCREENING

The requirements for hazard identification, as stipulated in DMA 2000 and its implementing regulations, are described below.

### DMA 2000 and FMA Requirements: Risk Assessment: Identifying Hazards

#### Identifying Hazards

**Requirement §201.6(c)(2)(i):** [The risk assessment shall include a] description of the type of all natural hazards that can affect the jurisdiction.

**FMA Requirement §78.5(b):** Description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential.

#### Element

- Does the plan include a description of the types of all natural hazards that affect the jurisdiction? If the hazard identification omits (without explanation) any hazards commonly recognized as threats to the jurisdiction, this part of the plan cannot receive a Satisfactory score. Consult with the State Hazard Mitigation Officer to identify applicable hazards that may occur in the planning area.

Source: FEMA, March 2004.

For the first step of the hazard analysis, the Task Force identified 21 possible hazards that could affect Mendocino County and the participating communities. The Task Force evaluated and screened the comprehensive list of potential hazards based on a range of factors, including prior knowledge or perception of the relative risk presented by each hazard, the ability to mitigate the hazard, and the known or expected availability of information on the hazard (see Table 5-1). The Task Force determined that eight hazards pose the greatest threat to the county: dam failure,

earthquake, flood (including winter storm), a hazardous materials event, landslide, tsunami, urban conflagration, and wildland fire. The remaining 13 hazards excluded through the screening process were considered to pose a lower threat to life and property in the county due to the low likelihood of occurrence or the low probability that life and property would be significantly affected. Should the risk from these hazards increase in the future, the MHMP can be updated to incorporate vulnerability analyses for these hazards.

**Table 5-1 Identification and Screening of Hazards**

<b>Hazard Type</b>	<b>Should It Be Profiled?</b>	<b>Explanation</b>
Avalanche	No	Mendocino County and all jurisdictions are not located in an area prone to frequent or significant snowfall.
Coastal Erosion	No	Beach erosion by wind and waves, bluff erosion by waves, and surface runoff are continuing occurrences. However, local geology rather than the littoral processes determines the amount of potential erosion. This assessment pertains to all jurisdictions.
Coastal Storm	No	This hazard will be addressed in the flood hazard profile.
Dam Failure	Yes	Several State-sized dams are located within Mendocino County; however, Fort Bragg and Point Arena are not located in areas prone to this hazard.
Drought	No	Similar to the entire State of California, drought is a problem. However, drought existing infrastructure for water storage and delivery within Mendocino County and all jurisdictions diminish the effects of this hazard.
Earthquake	Yes	Several active faults, including the San Andreas Fault, run through Mendocino County and all jurisdictions.
Expansive Soils	No	No historic events have occurred in Mendocino County or other jurisdictions.
Extreme Heat	No	While extreme temperatures are known to occur, prolonged heat waves are rare throughout Mendocino County and all jurisdictions.
Flood (including Winter Storm)	Yes	History of flooding is associated with winter storms Mendocino County and all jurisdictions.
Hailstorm	No	No significant historic events have occurred in Mendocino County or other jurisdictions.
Hurricane	No	No significant historic events have occurred in Mendocino County or other jurisdictions.
Land Subsidence	No	No historic events have occurred in Mendocino County or other jurisdictions.
Landslide	Yes	Mendocino County and all jurisdictions are vulnerable to slope instability along the Coastal Range, river and stream banks, and fault zones, especially after prolonged rainfalls.
Snow	No	Mendocino County or other jurisdictions. is not located in an area prone to frequent or significant snowfall.
Tornado	No	No significant historic events have occurred in Mendocino County or other jurisdictions.
Tsunami	Yes	Observed tsunami-generated waves have reached the county coast.
Volcano	No	No significant historic events have occurred in Mendocino County or other jurisdictions.

**Table 5-1 Identification and Screening of Hazards**

<b>Hazard Type</b>	<b>Should It Be Profiled?</b>	<b>Explanation</b>
Urban Conflagration	Yes	Historic downtowns of the cities of Fort Bragg, Point Arena, Ukiah, and Willits include wood-frame structures that are clustered close together.
Wildland Fires	Yes	The terrain, vegetation, and weather conditions in the region are favorable for the ignition and rapid spread of wildland fires in Mendocino County and all jurisdictions.
Windstorm	Yes	While high winds are associated with winter storms, they are not significant enough to be addressed as a stand-alone hazard. However, high winds are discussed within the flood profile.
Other: Hazardous Materials	Yes	Hazardous materials facilities and major transportation routes are located throughout Mendocino County and all jurisdictions.

**5.3 HAZARD PROFILE**

The requirements for hazard profiles, as stipulated in DMA 2000 and its implementing regulations, are described below.

**DMA 2000 and FMA Requirements: Risk Assessment – Profiling Hazards**

**Profiling Hazards**

**Requirement §201.6(c)(2)(i):** [The risk assessment shall include a] description of the 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.

**FMA Requirement §78.5(b):** Description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential.

**Element**

- Does the risk assessment identify the location (i.e., geographic area affected) of each natural hazard addressed in the plan?
- Does the risk assessment identify the extent (i.e., magnitude or severity) of each hazard addressed in the plan?
- Does the plan provide information on previous occurrences of each hazard addressed in the plan?
- Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the plan?

Source: FEMA, March 2004.

The specific hazards selected by the Task Force for profiling have been examined in a methodical manner based on the following factors:

- Nature
- History
- Location
- Extent

- Probability of future events

The hazards profiled for Mendocino County (including the participating jurisdictions) are presented in the rest of Section 5.3 in alphabetical order. The order of presentation does not signify the level of importance or risk.

## 5.3.1 Dam Failure

### 5.3.1.1 Nature

A dam failure is the structural collapse of a dam that releases the water stored in the reservoir behind the dam. A dam failure is usually the result of the age of the structure, inadequate spillway capacity, or structural damage caused by an earthquake or flood. The sudden release of water has the potential to cause human casualties, economic loss, and environmental damage. This type of disaster is dangerous because it can occur rapidly, providing little warning and evacuation time for people living downstream. The flows resulting from dam failure generally are much larger than the capacity of downstream channels and can therefore lead to extensive flooding. Flood damage occurs as a result of the momentum of the flood caused by the sediment-laden water, flooding over the channel banks, and impact of debris carried by the flow.

### 5.3.1.2 History

While none of the dams within the county have failed, during the New Year’s 2005–2006 winter storm event runoff was so high that it spilled over the entire crest of the Mendocino 3 Upper Dam, even though the standpipe and filter valves were open.

### 5.3.1.3 Location, Extent, and Probability of Future Events

Figure C-3 (Appendix C) shows the location of 24 dams and reservoirs located within the county. Twenty of these dams are regulated by the California Division of Safety of Dams (DSOD). State-size dams are more than 25 feet in height and hold back more than 15 acre-feet of water or are more than 6 feet in height and hold more than 50 acre-feet of water. The State-size dams in Mendocino County are listed in Table 5-2.

**Table 5-2 State Regulated Dams in Mendocino County**

Dam	Year Constructed	Type*	Stream	Capacity (acre-feet)	Reservoir Area (acre-feet)
Lake Ada Rose	1964	ERTH	Willits Creek tributary	138	7
Bevans Creek	1955	ERRK	Bevans Creek	215	11
Bradford	1985	ERTH	Russian River tributary	440	22
Brookstrail 3 North	1970	ERTH	Willits Creek	275	10
Centennial	1990	ERTH	Davis Creek	635	33
Cornett	1974	ERTH	Russian River tributary	65	6

Crawford Ranch	1972	ERTH	Mcdowell Creek tributary	340	17
Jayne's Lake	1985	ERTH	Toney Creek	1225	55
Lolonis Vineyards	1999	ERTH	W Fork Russian River tributary	209	10
Mast	1963	ERTH	Cahto Creek tributary	380	14
Mcguire	1967	ERTH	S. Fork Noyo River	190	21
McNab	1947	ERTH	McNab Creek	96	7
Mendocino 3 Upper	1915	GRAV	Middle Creek	85	5
Mendocino Middle	1908	GRAV	Middle Creek	27	2
Mill Pond	1885	ERTH	Mill Pond	72	9
Morris	1927	CORA	James Creek	845	46
Round Mountain	1964	ERTH	York Creek tributary	282	17
Scout Lake	1964	ERTH	Berry Creek tributary	1140	70
Van Arsdale	1907	GRAV	South Eel River	700	163
Williams Valley	1965	ERTH	Short Creek tributary	200	15

**Source:** California Division of Dam Safety 2007.

\*CORA = constant radius arch, ERTH = earth fill, ERRK = earth and rock fill, GRAV = gravity.

Coyote Valley Dam is not listed in this table because it is owned and operated by a Federal agency, the U.S. Army Corps of Engineers. It was built in 1959 as an ERTH dam, has a capacity of 122,400 acre-feet, and reservation of 1922 acre-feet.

As shown on Figure C-3, dam inundation maps have been prepared for the larger dams, including Brooktrails 3 North (Lake Emily), Coyote Valley Dam (Lake Mendocino), Round Mountain Dam, Scott Dam, Morris Dam, and Scout Lake Dam (Lake Pillsbury). Failure of the Coyote Valley Dam exceeds the 100-year floodplain boundary and will inundate the Ukiah Valley and the town of Hopland while the failure of either the Scout Dam or Morris Dam will be contained within the 100-year floodplain boundary, but inundate the northeastern portion of Willits and the unincorporated lands surrounding it.

The collapse and structural failure of a dam may be caused by a severe winter storm, internal erosion of piping, or an earthquake. Preliminary engineering studies indicate that the static stability of several older dams, including the Upper and Middle dams, is marginal to inadequate under major (magnitude 7.0 or larger) seismic shaking. In addition to the Upper and Middle dams, 9 other dams within the county are located within 1 mile of a mapped fault, including Round Mountain Dam (0.0001 mile), Brooktrails 3 North (0.25 mile), Coyote Valley Dam (0.86 mile), and Morris Dam (0.92 mile).

If a dam within the county fails, it is likely to spill over during a severe winter storm event (every 3-4 years) or during a significant earthquake event (180-260 years for a major earthquake).

## 5.3.2 Earthquake

### 5.3.2.1 *Nature*

An earthquake is a sudden motion or trembling caused by a release of strain accumulated within or along the edge of the earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. Earthquakes usually occur without warning and, after just a few seconds, can cause massive damage and extensive casualties. The most common effect of earthquakes is ground motion, or the vibration or shaking of the ground during an earthquake.

Ground motion generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. It causes waves in the earth's interior, also known as seismic waves, and along the earth's surface, known as surface waves. Two kinds of seismic waves occur: P (primary) waves are longitudinal or compressional waves similar in character to sound waves that cause back-and-forth oscillation along the direction of travel (vertical motion), and S (secondary) waves, also known as shear waves, are slower than P waves and cause structures to vibrate from side to side (horizontal motion). Also two kinds of surface waves occur: Rayleigh waves and Love waves. These waves travel more slowly and typically are significantly less damaging than seismic waves.

In addition to ground motion, several secondary natural hazards can occur from earthquakes, such as the following:

- **Surface Faulting** is the differential movement of two sides of a fault at the earth's surface. Displacement along faults, both in terms of length and width, varies but can be significant (e.g., up to 20 feet), as can the length of the surface rupture (e.g., up to 200 miles). Surface faulting can cause severe damage to linear structures, including railways, highways, pipelines, and tunnels.
- **Liquefaction** occurs when seismic waves pass through saturated granular soil, distorting its granular structure, and causing some of the empty spaces between granules to collapse. Pore water pressure may also increase sufficiently to cause the soil to behave like a fluid for a brief period and cause deformations. Liquefaction causes lateral spreads (horizontal movements of commonly 10 to 15 feet, but up to 100 feet), flow failures (massive flows of soil, typically hundreds of feet, but up to 12 miles), and loss of bearing strength (soil deformations causing structures to settle or tip). Liquefaction can cause severe damage to property.
- **Landslides/Debris Flows** occur as a result of horizontal seismic inertia forces induced in the slopes by the ground shaking. The most common earthquake-induced landslides include shallow, disrupted landslides such as rock falls, rockslides, and soil slides. Debris flows are created when surface soil on steep slopes becomes totally saturated with water. Once the soil liquefies, it loses the ability to hold together and can flow downhill at very high speeds, taking vegetation and/or structures with it. Slide risks increase after an earthquake during a wet winter.
- **Tsunamis:** As an Oceanic Plate is subducted beneath a Continental Plate, it sometimes brings down the lip of the Continental Plate with it. Eventually, too much stress is put on the lip and it snaps back, sending shockwaves through the earth's crust, causing a tremor under the sea, known as an Undersea Earthquake. Factors that affect tsunami generation from an

earthquake event include magnitude (generally, a 7.5 magnitude and above), depth of event (a shallow marine event that displaces seafloor), and type of earthquake (thrust as opposed to strike-slip).

The severity of an earthquake can be expressed in terms of intensity and magnitude. Intensity is based on the damage and observed effects on people and the natural and built environment. It varies from place to place depending on the location with respect to the earthquake epicenter, which is the point on the Earth’s surface that is directly above where the earthquake occurred. The severity of intensity generally increases with the amount of energy released and decreases with distance from the fault or epicenter of the earthquake. The scale most often used in the U.S. to measure intensity is the Modified Mercalli (MM) Intensity Scale. As shown in Table 5-3, the MM Intensity Scale consists of 12 increasing levels of intensity that range from imperceptible to catastrophic destruction. Peak ground acceleration (PGA) is also used to measure earthquake intensity by quantifying how hard the earth shakes in a given location. PGA can be measured in *g*, which is acceleration due to gravity (see Table 5-3).

Magnitude is the measure of the earthquake strength. It is related to the amount of seismic energy released at the earthquake’s hypocenter, the actual location of the energy released inside the earth. It is based on the amplitude of the earthquake waves recorded on instruments, known as the Richter magnitude test scales, which have a common calibration (see Table 5-3).

**Table 5-3 Magnitude/Intensity/Ground-Shaking Comparisons**

Magnitude	Intensity	PGA (% <i>g</i> )	Perceived Shaking
0 – 4.3	I	<0.17	Not Felt
	II-III	0.17 – 1.4	Weak
4.3 – 4.8	IV	1.4 – 3.9	Light
	V	3.9 – 9.2	Moderate
4.8 – 6.2	VI	9.2 – 18	Strong
	VII	18 – 34	Very Strong
6.2 – 7.3	VIII	34 – 65	Severe
	IX	65 – 124	Violent
7.3 – 8.9	X	124 +	Extreme
	XI		
	XII		

**5.3.2.2 History**

Historically, the San Andreas fault system is the most active fault system in the State, generating very strong earthquakes of magnitude 7.0 or greater. The last major earthquake on the northern portion of the fault occurred in 1906. Known as the Great San Francisco earthquake, the event lasted 45 to 60 seconds and was in the range of magnitude 7.7 to 7.9. Local planning documents indicate that this event caused severe shaking and extensive damage throughout the county, and that a 25-foot lateral displacement across the fault occurred in the unincorporated community of Manchester.

In addition to the San Andreas fault activity, the Maacama Fault produced a reported 5.6 earthquake in the Ukiah area in 1869 as well as an abundance of microquakes in recent years. In addition, as illustrated on Figure C-4 (Appendix C), available data show this fault as well as several other regional faults have generated 24 earthquakes larger than a magnitude 4.0 with an epicenter within the county limits occurred from 1942 – 2000.

The county has also experienced significant shaking from a seismic source not located within county boundaries, but about 30 miles northwest of the coastline. The Cascadia Subduction Zone is considered capable of generating the largest quakes in the country. In recent years, movement along the Cascadia Subduction Zone's margins in Northern California have generated magnitude 6.0 – 7.2 earthquakes, including a magnitude 7.2 earthquake on June 15, 2005 and a magnitude 6.6 earthquake on June 17, 2005.

### 5.3.2.3 *Location, Extent, and Probability of Future Events*

As noted above, the San Andreas fault system is the most active and well studied fault system in California. In its entirety, it runs 800 miles down the California coastline, staying entirely inland to the south of San Francisco. In Mendocino County, the Shelter Cove section of the fault zone extends 74 miles from the Punta Gorda area south-southeast to the vicinity offshore of Point Arena. The North Coast section extends from Point Area approximately 110 miles southeast to the Golden Gate.

The San Andreas fault zone is comprised of a network of dextral strike-slip faults that constitute the San Andreas fault system that collectively accommodates the majority of relative N-S motion between the Pacific and North American plates. Major elements of the San Andreas fault system include the Bartlett Springs and Maacama fault zones. The Bartlett Springs fault zone, which is comprised of the Round Valley, Barton Springs, and Lake Mountain sections, can be mapped for at least 74 miles from the southern side of Round Valley southeast to near Clear Lake. The Maacama fault, which includes the northern and southern sections, extends 50 miles from near Laytonville in Mendocino County nearly to Mark West Creek in Sonoma County.

In addition to these Class A and B faults, several less active faults are located in Mendocino County, as shown on Figure C-5 (Appendix C), and include: Garberville-Briceland fault zone, Great Valley fault zone, Brush Mountain shear zone, Whale Gulch-Bear Harbor fault zone, Clover Valley fault zone, Corning fault, Big Valley fault zone, Cross Springs fault zone, Little Indian Valley fault zone, Resort fault zone, Konocti Bay fault zone, West Margin fault, and Stoney Creek fault.

As noted earlier, the severity or extent of an earthquake can be expressed in terms of intensity, and the PGA measures the earthquake's intensity by quantifying how hard the earth shakes in a given location. PGA can be measured in  $g$ , which is acceleration due to gravity. The seismic shaking hazard map, as shown on Figure C-5 (Appendix C), shows the level of ground motion that has an annual probability of 1 in 475 of being exceeded each year, which is equal to a 10 percent probability of being exceeded in 50 years. As such, this map shows that the areas most susceptible severe to extreme shaking (MMI VIII-X) are those located along San Andreas fault system, which include the southwestern, central, and northwestern portions of the county.

Several average values of recurrence have been reported for the San Andreas fault zone; in general they range from 200 – 400 years, with the North Coast section ranges from 180 – 260

years for a major (magnitude of 7.0 or larger) earthquake and a reported unknown recurrence interval along the Shelter Cove section. Geologic studies suggest that a minimum recurrence interval of at least 370 years to 500 years for a significant earthquake along the Maacama fault. Recurrence intervals along the Barlett Springs fault have not been determined.

### 5.3.3 Flood

#### 5.3.3.1 *Nature*

Flooding is the accumulation of water where usually none occurs or the overflow of excess water from a stream, river, lake, reservoir, or coastal body of water onto adjacent floodplains. Floodplains are lowlands adjacent to water bodies that are subject to recurring floods. Floods are natural events that are considered hazards only when people and property are affected.

Nationwide, floods result in more deaths than any other natural hazard. Physical damage from floods includes the following:

- Inundation of structures, causing water damage to structural elements and contents.
- Erosion or scouring of stream banks, roadway embankments, foundations, footings for bridge piers, and other features.
- Impact damage to structures, roads, bridges, culverts, and other features from high-velocity flow and from debris carried by floodwaters. Such debris may also accumulate on bridge piers and in culverts, increasing loads on these features or causing overtopping or backwater effects.
- Destruction of crops, erosion of topsoil, and deposition of debris and sediment on croplands.
- Release of sewage and hazardous or toxic materials as wastewater treatment plants are inundated, storage tanks are damaged, and pipelines are severed.

Floods also result in economic losses through closure of businesses and government facilities, disrupt communications, disrupt the provision of utilities such as water and sewer service, result in excessive expenditures for emergency response, and generally disrupt the normal function of a community.

In Mendocino County two types of flooding occur: riverine flooding, also known as overbank flooding, due to excessive rainfall, and coastal flooding due to wave run-up. Riverine floodplains range from narrow, confined channels in the steep valleys of mountainous and hilly regions to wide, flat areas in plains and coastal regions. The amount of water in the floodplain is a function of the size and topography of the contributing watershed, the regional and local climate, and land use characteristics. Flooding in steep, mountainous areas is usually confined, strikes with less warning time, and has a short duration. Larger rivers typically have longer, more predictable flooding sequences and broad floodplains.

Localized flooding may occur outside of recognized drainage channels or delineated floodplains due to a combination of locally heavy precipitation, increased surface runoff, and inadequate facilities for drainage and stormwater conveyance. Such events frequently occur in flat areas and in urbanized areas with large impermeable surfaces. Local drainage may result in “nuisance

flooding,” in which streets or parking lots are temporarily closed and minor property damage occurs.

Coastal flooding in Mendocino County is generally caused by wave run-up. Pacific Ocean storms in the months of November through February in conjunction with high tides and strong winds can cause significant wave run-up. In addition to intense offshore storms, coastal flooding from the Pacific Ocean can also be attributed to seismic sea-waves or tsunamis that can occur at any time of the year. As such, coastal flooding can be exacerbated by the physical characteristics of the continental shelf and shoreline.

### *5.3.3.2 History*

In general, major floods within Mendocino County have resulted from extended periods of winter rainfall produced by winter storms from the Pacific Ocean. Generally, these storms affect the region from early November until the end of March. In addition to rainfall, these events are often associated with intense winds and landsliding.

Historical records from 1911 through 2006 indicate that flooding, and additionally landsliding, embankment failures, and high winds, were experienced in portions of Mendocino County during the following periods: November 1912, December 1937, December 1955, December 1964, April 1964, January 1966, January 1974, January 1978, February, 1983, February 1986, January 1995, March 1995, January 1997, February 1998, and December 2005 – January 2006. The last eight major events have all been Federal disaster declarations.

The extent of flood depths and damage potential from the most recent Federally-declared winter storm disaster in December 2005 – January 2006 are summarized below:

- Calpella: Floodwaters washed out a section of an embankment within a few feet of a sewer main along West Fork of the Russian River.
- Fort Bragg: Due to heavy rains, water levels in Pudding Creek increased significantly, scouring the side of the stream bed and exposing a sewer force main.
- Gualala: A sewage storage pond embankment slipped as a result of ground saturation under heavy rains.
- Hopland: Overflow of the Russian River flooded the Hopland Volunteer Fire Department Building to a depth of 4 feet. In addition, floodwaters from the Feliz Creek inundated and destroyed the Hopland Public Utilities District’s generator and damaged the sewer plant’s access road and inundated and damaged 89 private homes in the Mountain House Road neighborhood. In addition, Hopland Elementary experienced significant flood damage.
- Noyo: Severe rain resulted in significant amounts of silt deposited in the Noyo River that provides access for moored boats to and from the ocean.
- Ukiah: Floodwaters overtopped the Russian River channel, approximately 1½ miles north of the Oak Manor residential development. Free flowing flood waters traveled south, causing damage to Ukiah’s new water treatment plant. Backed-up feed creeks flowed through the city causing major flash flooding and debris flows, impacting downtown Ukiah businesses and residential areas. Perkins Street, Orchard Street, and U.S. 101 were inundated by several feet of flood waters. Talmage Road, South State Street intersection and Downtown North State

Street were flooded and impacted with massive debris flows. In addition, the Grace Hudson Museum Building, the city's hydroelectric plant, electrical control center, wastewater treatment plant, landfill, golf course, and several parks, including Riverside Park, Vinewood Park, Todd Grove Park, Oak Manor Park, and the Ukiah Sports Complex, experienced damage due to heavy rain, strong wind driven rain, and runoff.

- Willits: Heavy rains and overflow from Baechtel Creek and Davis Creek washed out sections of the access road to the sewer pond holding basin and destroyed a water data logger.
- Countywide: Heavy rains and velocity runoff from caused sediment debris from uphill embankments to slide on to county roads from Ukiah, Booneville, Point Arena, Fort Bragg, Laytonville, Colvelo, and Willits subdivisions making the roads impassable. In addition similar damage was observed along Fish Rock, Peachland, Poonkinney, Elk Horn, Eel River, Low Gap, and Tomki roads.

### 5.3.3.3 Location, Extent, and Probability of Future Events

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 often use historical records, such as stream-flow gages, to determine the probability of occurrence for floods of different magnitudes. The probability of occurrence is expressed in percentages as the chance of a flood of a specific extent occurring in a given year.

The following factors contribute to the frequency and severity of riverine flooding:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including steepness of terrain, soil types, amount, and type of vegetation, and density of development
- The existence of attenuating features in the watershed, including natural features such as swamps and lakes and human-built features such as dams
- The existence of flood control features, such as levees and flood control channels
- Velocity of flow
- Availability of sediment for transport, and the erodibility of the bed and banks of the watercourse

The following factors contribute to the frequency and severity of coastal flooding:

- Astronomical tides
- Storm surge, which is the rise in water from wind stress and low atmospheric pressure
- Waves
- Peak still-water elevation

The magnitude of flood used as the standard for floodplain management in the U.S. is a flood having a probability of occurrence of 1 percent in any given year, also known as the 100-year flood or base flood. The most readily available source of information regarding the 100-year

flood is the system of Flood Insurance Rate Maps (FIRMs) prepared by FEMA. These maps are used to support the NFIP. The FIRMs show 100-year floodplain boundaries for identified flood hazards. These areas are also referred to as Special Flood Hazard Areas and are the basis for flood insurance and floodplain management requirements. The FIRMs also show floodplain boundaries for the 500-year flood, which is the flood having a 0.2 percent chance of occurrence in any given year. FEMA has prepared FIRMs for Mendocino County (revised: January 1992), Fort Bragg (revised: June 1992), Point Arena (prepared: June 1986), Ukiah (revised: August 1985), and Willits (revised: September 1988). FEMA is currently in the process of preparing a countywide digital FIRM for Mendocino County, which will incorporate the flood hazard information for both the incorporated and unincorporated areas of the county.

The FIRMs and Flood Insurance Studies for Mendocino County and its incorporated communities show identified Special Flood Hazard Areas for the following flooding sources:

- Mendocino County: Russian River, Forsythe Creek, Mill Creek, York Creek, Hensley Creek, Ackerman Creek, East Fork Russian River, Eel River, Anderson Creek, Mill Creek, North Fork Mill Creek, Robinson Creek, Feliz Creek, Tenmile Creek, Town Creek, Davis Creek, Orrs Creek, Gibson Creek, Garcia River, Doolin Creek, Haehl/Baechtel Creek, and Noyo River.
- Fort Bragg: Noyo River
- Point Arena: wave attack from the Pacific Ocean
- Ukiah: Orrs Creek, Gibson Creek, Russian River
- Willits: Haehl/Baechtel Creek, Broaddus Creek, and Mill Creek

Figure C-6 (Appendix C) shows the extent of the 100-year and 500-year floodplains. An area totaling 67.85 square miles within the county is within the 100-year floodplain and an additional 2.10 square miles is within the 500-year floodplain. Flood depths in the identified floodplains range from 1-8 ft. in Ukiah Valley, 1-5 ft. in the Little Lake area of Willits, 1-15 ft. along the Navarro River, 1-8 ft. along the Garcia River, and 1-10 ft. along the Eel River in the community of Longvale.

While most of the floodplains are located within relatively undeveloped areas, infrastructure and other nonresidential and residential development susceptible to flooding include:

- State Route 175 at the Russian River Bridge
- State Route 1 at the Garcia River
- Talmage Court – east side of the Ukiah Valley
- Ukiah – eastern side along/near the Russian River
- Little Lake Valley near Willits sewage treatment plant
- Confluence of Anderson, Roversin, and Mill Creeks near Boonville
- Tenmile Creek near Laytonville
- Town Creek near Covelo
- South Fork of Eel

- Felize Creek and Russian River near Hopland
- Mill Creek in the Talmage area

In addition, specific assets at risk to flooding, including critical facilities and infrastructure, residential and nonresidential structures, and Repetitive Loss properties, are described in the following section, as well as the community-specific appendices.

Based on previous occurrences, Mendocino County can expect a serious flood event to occur every 3 – 4 years, and in particular, during strong El Niño years (every 7 – 8 years).

### 5.3.4 Hazardous Materials Event

#### 5.3.4.1 Nature

Hazardous materials include hundreds of substances that pose a significant risk to humans. These substances may be highly toxic, reactive, corrosive, flammable, radioactive, or infectious. Numerous Federal, State, and local agencies, including the U.S. Environmental Protection Agency (EPA), U.S. Department of Transportation (DOT), National Fire Protection Association, FEMA, the U.S. Army, and the International Maritime Organization regulate hazardous materials.

Hazardous material releases can occur from any of the following:

- Fixed site facilities (such as refineries, chemical plants, storage facilities, manufacturing facilities, warehouses, wastewater treatment plants, swimming pools, dry cleaners, automotive sales/repair, gas stations, etc.)
- Highway and rail transportation (such as tanker trucks, chemical trucks, and railroad tankers)
- Air transportation (such as cargo packages)
- Pipeline transportation (liquid petroleum, natural gas, and other chemicals)

Unless exempted, facilities that use, manufacture, or store hazardous materials in the U.S. fall under the regulatory requirements of the Emergency Planning and Community Right to Know Act (EPCRA) of 1986, enacted as Title III of the Federal Superfund Amendments and Reauthorization Act (42 USC 11001–11050 [1988]). Under EPCRA regulations, hazardous materials that pose the greatest risk for causing catastrophic emergencies are identified as Extremely Hazardous Substances (EHSs). These chemicals are identified by the EPA in the *List of Lists – Consolidated List of Chemicals Subject to the Emergency Planning and Community Right-to-Know Act (EPCRA) and Section 112 of the Clean Air Act*. Releases of EHSs can occur during transport and from fixed facilities. Transportation-related releases are generally more troublesome because they can occur anywhere, including close to human populations, critical facilities, or sensitive environmental areas. Transportation-related EHS releases are also more difficult to mitigate due to the variability of locations and distance from response resources.

In addition to accidental human-caused hazardous material events, natural hazards may cause the release of hazardous materials and complicate response activities. The impact of earthquakes on fixed facilities may be particularly serious due to the impairment or failure of the physical integrity of containment facilities. The threat of any hazardous material event may be magnified due to restricted access, reduced fire suppression and spill containment, and even complete cut-

off of response personnel and equipment. In addition, the risk of terrorism involving hazardous materials is considered a major threat due to the location of hazardous material facilities and transport routes throughout communities and the frequently limited antiterrorism security at these facilities.

**5.3.4.2 History**

The National Response Center, which serves as the Federal point of contact for reporting oil, chemical, radiological, biological, and etiological discharges into the environment, Web-based query system shows that since November 1, 2002, 99 oil and chemical spills have occurred throughout Mendocino County. Of the total number of incidents, as shown in Table 5-4, over two-thirds occurred near or within Fort Bragg.

**Table 5-4 Oil and Chemical Spill Incidents, 2002–2007**

<b>Number of Incidents</b>	<b>Type of Incident</b>	<b>Causes</b>	<b>Medium Affected</b>	<b>Material</b>
38	Unknown Sheen	Unknown	Water	Oil, Fuel
36	Vessel	Equipment Failure, Operator Error, Vessel Sinking	Water	Bilge Sludge, Hydraulic Fuel, Gasoline, Light Crude Oil, Diesel
13	Fixed	Equipment Failure, Dumping, Natural Phenomenon	Land, Water	Raw Sewage, Unknown Oil, Diesel, Polychlorinated Biphenyls
8	Storage Tank	Unknown	Water	Oil, Used Oil Filters, Battery Oil
4	Mobile	Equipment Failure, Unknown, Operator Error	Water	Sludge, Hydraulic Oil

**Source:** National Response Center 2007.

In addition to the National Response Center, the EPA’s Environmental Facts Multisystem Query contains information about facilities that are required to report activity (Superfund, water, waste, radiation, air, chemical, and toxic releases) to a State or Federal system. As such, 19 facilities have permits to discharge to water, 147 facilities are hazardous waste handlers, 10 facilities have reported toxic releases, 3 facilities have reported air releases, and 6 facilities are active or archived Superfund sites.

**5.3.4.3 Location, Extent, and Probability of Future Events**

As noted above, almost 150 facilities are hazardous waste handlers. In addition, according to local planning documents, approximately 400 businesses within the county generate hazardous waste as a result of their activities. Generally, the small, fixed facilities (drycleaners, auto body shops, etc.) have varying uses of hazardous chemicals, but in general do not pose a significant risk to the county. However, as shown on Figure C-7, nine facilities have reportable quantities of

EHSs, including ammonium bifluoride, hydrofluoric acid, nitric acid, sulfuric acid, which could cause death or irreversible damage after relatively short exposure to small amounts.

In addition to fixed facilities, hazardous material events have the potential to occur along the coast, highways, and the railroad tracks. Vessels, trucks, and trains that use these transportation arteries, and in particular State Routes 101 and 20 east of Calpella, commonly carry a variety of hazardous materials including gasoline, other crude oil derivatives, and other chemicals known to cause human health problems.

Comprehensive information on the probability and magnitude of hazardous material events from all types of sources (such as fixed facilities or transport vehicles) is not available. Wide variations among the characteristics of hazardous material sources and among the materials themselves make such an evaluation difficult. While it is beyond the scope of this MHMP to evaluate the probability and magnitude of hazardous material events within the county in detail, it is possible to determine the exposure of population, buildings, and critical facilities should such an event occur. As such, Figure C-7 shows the areas at risk for a hazardous material event, including an area within a 1/4-mile radius of State and Federal highways and the EHS facilities.

### 5.3.5 Landslide

#### 5.3.5.1 *Nature*

Landslide is a general term for the dislodgment and fall of a mass of soil or rocks along a sloped surface or for the dislodged mass itself. The term is used for varying phenomena, including mudflows, mudslides, debris flows, rock falls, rockslides, debris avalanches, debris slides, and slump-earth flows. Landslides may result from a wide range of combinations of natural rock, soil, or artificial fill. The susceptibility of hillside and mountainous areas to landslides depends on variations in geology, topography, vegetation, and weather. Landslides may also occur due to indiscriminate development of sloping ground or the creation of cut-and-fill slopes in areas of unstable or inadequately stable geologic conditions.

Landslides often occur together with other natural hazards, thereby exacerbating conditions, as described below.

- Shaking due to earthquakes can trigger events ranging from rock falls and topples to massive slides.
- Intense or prolonged precipitation that causes flooding can also saturate slopes and cause failures leading to landslides.
- Landslides into a reservoir can indirectly compromise dam safety, and a landslide can even affect the dam itself.
- Wildfires can remove vegetation from hillsides, significantly increasing runoff and landslide potential.

#### 5.3.5.2 *History*

Landslides, and in particular slipouts and washouts, generally coincide with strong winter storm and flood events. As noted in Section 5.3.3, Mendocino County has experienced these events

about every 3 – 4 years over the past 20 years. In particular the February 1983, February 1986, January 1995, March 1995, January 1997, February 1998, and December 2005 – January 2006 events were all Federal disaster declarations. Recently, landslides, slipouts, and washouts associated with the December 2005 – January 2006 storm occurred along: Highway 1 near Point Arena; State Route 128 near Yorkville and Boonville, State Route 20 near Willits; Highway 101 near Leggett, and Route 235 near Boonville, to name a few. Generally, the causes of these failures were from (1) roadway fill material that became too saturated and failed and (2) mountainsides that became too saturated, began sliding, and caused extensive amounts of slide material and debris to fall onto roadways.

### *5.3.5.3 Location, Extent, and Probability of Future Events*

The location, extent, and probability of landslides are difficult to determine with a high degree of certainty. However, using the degree of a slope, areas of low, moderate, and high landslide hazard risk can be identified. Areas in the county with slopes of 0 to 14 degrees have a low landslide risk. Most of the areas within Fort Bragg, Willits, Ukiah, and Point Arena have a low risk of landslides. Moderate landslide risk areas are assessed to slopes ranging from 14 to 32 degrees, with high landslide risk occurring in areas with slopes of 32 to 72 degrees. As a whole, most of the county has moderate to high landslide hazard areas. Along highways 101 and 1 in the northern reaches of the county, moderate to high risk of landslides exist. Seaside bluffs along the western portion of the county are all potentially unstable, thus are also areas of high landslide risk. Figure C-8 illustrates landslide hazard areas within Mendocino County and the cities of Fort Bragg, Willits, Ukiah, and Point Arena.

Pudding Creek in Fort Bragg along the Inner Gorge have moderate to high landslide hazard areas. All critical facilities in Fort Bragg are in a low risk area. Point Arena has a strip of moderate and high landslide areas along the Point Arena Creek skirting the southwestern boundary of the city, with smaller pockets of moderate hazard areas in the southeast corner and along Windy Hollow Road in the northwest portion of the city. Much of Ukiah is situated in areas of low landslide hazard, with a relatively small strip of moderate hazard dotted with pockets of high hazard areas in the western portion of the city boundaries. Willits has a few slopes within the western portion of the city that are of moderate risk and is primarily at a low risk of landslides.

The extent or size of a landslide will vary depending on the proportion of and type of material it carries, the geology of the area, and the initial cause of the slide. In general, rainfall-initiated landslides tend to be smaller (usually 100 – 5,000 cubic yards) than those triggered by earthquakes. Within Mendocino County, landslides generally occur in areas of steep slopes and where the soil is instable such as in the eastern portion of the county. However, landslides can also occur in areas with lower relief (i.e., slopes less than 14 degrees), where they may result from cut-and-fill failure, river bluff failures, and lateral spreading. Landslides are also common along deep road cuts, riverbanks, lakeshores, coastal cliffs, and steep valleys and stream canyons. Areas with loose, weak rock and soil, water saturated soils, or rock located in areas with a high water table also have an increased likelihood of landslides.

Landslides are often a secondary hazard resulting from winter storms and flooding. Coastal storms produce wind, waves, intense rain and storm surges that cause flooding, landslides, and erosion. El Niño/El Niña events, degree of slope, slope materials, soil and rock characteristics,

moisture content, soil permeability, vegetative cover/deforestation, human activity, mining, drawdown of reservoirs, and excavation of slopes are factors that contribute to the extent and probability of a landslide. Based on previous occurrences of landslides induced by flooding events, Mendocino County can expect landslide events to occur in relation to major flood events every 3 to 4 years and particularly during strong El Niño years, which occur approximately every 7 to 8 years.

### 5.3.6 Tsunami

#### 5.3.6.1 *Nature*

A tsunami is a series of waves generated in a body of water by an impulsive disturbance along the seafloor that vertically displaces the water. Subduction earthquakes at plate boundaries most frequently cause a tsunami. However, tsunamis can be generated by submarine landslides as well as by the collapses of volcanic edifices and violent submarine volcanic eruptions.

A single tsunami event may involve a series of waves, known as a train, of varying heights. In open water, tsunamis have extremely long periods of time (from minutes to hours) for the next wave top to pass a point after the previous one. Additionally, a tsunami wavelength can extend up to several hundred miles, very different from typical wind-generated swells on the ocean, which might have a period of about 10 seconds and a wavelength of 300 feet.

The actual height of a tsunami wave in open water is generally only 1 to 3 feet and is often practically unnoticeable to people on ships. The energy of a tsunami passes through the entire water column to the seabed, unlike surface waves, which typically reach only down to a depth of 30 feet or so. The tsunami wave travels across the ocean at speeds up to 700 miles per hour. As the wave approaches land, the sea shallows and the wave no longer travels as quickly, so the wave begins to “pile up” as the wave-front becomes steeper and taller, and less distance occurs between crests. Therefore, the wave can increase to a height of 90 feet or more as it approaches the coastline and compresses. This steepening process is often compared to the sound of a cracking whip.

A tsunami not only affects beaches that are open to the ocean, but also bay mouths, tidal flats, and the shores of large coastal rivers. Tsunami waves can also diffract around land masses. And since tsunamis are not symmetrical, the waves may be much stronger in one direction than another, depending on the nature of the source and the surrounding geography. However, tsunamis do propagate outward from their source, so coasts in the shadow of affected land masses are usually fairly safe.

#### 5.3.6.2 *History*

As shown in Table 5-5, 12 observed tsunamis generated waves in Northern California over the last 60 years. Almost all of the tsunamis were produced by earthquakes and resulted in wave run-ups of 1 meter or less. The largest tsunami to affect the county’s coast occurred on March 27, 1964, as a result of the magnitude 9.2 earthquake in the Northern Prince William Sound. The tsunami reached the Northern California coast within 5 hours of the seismic event. In the community of Noyo, 10 to 20 boats sunk, and an additional 100 boats were damaged.

Table 5-5 Historic Mendocino County Tsunami Events, 1946–2006

Date	Source Location	Source Type	Closest Recorded Wave Height Location	Maximum Run-Up (Feet)
6/23/2001	Southern Coast of Peru	8.4 M Earthquake	Arena Cove	.50
6/10/1996	Gulf of Alaska	7.7 M Earthquake	Crescent City	1.0
9/1/1994	Northern California	7.0 M Earthquake	Crescent City	.23
4/25/1992	Northern California	7.2 M Earthquake	Arena Cove	.39
3/6/1988	Gulf of Alaska	7.8 M Earthquake	San Francisco	.33
11/30/1987	Gulf of Alaska	7.9 M Earthquake	San Francisco	.16
5/7/1986	Central Aleutian Island, Alaska	8.0 M Earthquake	Crescent City	.33
2/4/1965	Western Aleutian Island, Alaska	8.7 M Earthquake	Crescent City	.33
3/28/1964	Gulf of Alaska	9.2 M Earthquake	Fort Bragg Arena Cove Point Arena	12.4 5.9 Observed
5/2/1960	Central Chile	9.5 M Earthquake	Gualala River	.20
3/9/1957	Central Aleutian Island, Alaska	9.1 M Earthquake	Crescent City	2.3
11/4/1952	Kamchatka, Russia	9.0 M Earthquake	Crescent City	3.3
4/1/1946	Eastern Aleutian Island, Alaska	7.3 M Earthquake	Arena Cove Fort Bragg Navarro River	7.8 4.6 Observed

Source: NOAA.

### 5.3.6.3 Location, Extent, and Probability of Future Events

Figure C-9 (Appendix C), shows that a 10-foot wave run-up would affect the entire coastal area of Mendocino County. In particular, the coastal low-lying areas and riverine valleys for the Navarro, Albion, Noyo, Garcia, and Ten Mile rivers would be inundated by run-up. Wave run-up would not reach the town of Manchester, but would inundate Noyo Harbor. Local planning documents suggest that a wave run-up of this height can be expected to impact the area every 80 years. However, based on previous occurrences, the wave run-ups of 3 feet can be expected every 5 years.

## 5.3.7 Urban Conflagration

### 5.3.7.1 Nature

Conflagration is a fire that occurs in the built environment, starting at one structure and quickly spreading to many more. Therefore, a fire conflagration expands uncontrollably beyond its

original source area to engulf adjoining regions. A conflagration can have many causes, including:

- Criminal acts (arson, illegal explosive devices, acts of terrorism, civil unrest)
- Residential accidents (improper use of electrical and heating appliances, improper storage of handling of flammables, faulty connections, grease fires, misuse of matches and lighters, and improper disposal of charcoal and wood ashes)
- Industrial accidents (hazardous material incidents, explosions, and transportation accidents)
- Acts of nature (lightning strike, ignitions following a large earthquake)

In addition, wind, extremely dry weather conditions, explosions, and a dense built environment can contribute to a conflagration.

### 5.3.7.2 History

The cities of Fort Bragg, Point Arena, Ukiah, and Willits do not have a considerable history of urban conflagration. Fires within these urban areas have for the most part been quickly contained. However, the 1906 earthquake resulted in a fire that threatened the entire City of Fort Bragg. The fire downtown burned the entire block bordered by Franklin, Redwood, and McPherson streets, plus the west side of Franklin. The west Franklin block burned down to approximately one half a block beyond the intersection of Redwood and Franklin.

### 5.3.7.3 Location, Extent, and Probability of Future Events

As shown on Figure C-11 (Appendix C) the locations of potential urban conflagration are confined to the cities of Fort Bragg, Point Arena, Ukiah, and Willits. Within these built environments, low intensity development, which includes areas with impervious surfaces that account for 20 to 49 percent of total cover and commonly include single-family housing units, are at a low risk to this hazard. Areas at moderate risk include medium intensity development, including areas with impervious surfaces that account for 50 to 79 percent of total cover and commonly include single-family housing units and a few multidwelling units. Finally, areas at high risk to an urban conflagration, include highly developed areas where people reside and/or work in high numbers, including apartment complexes, row houses, and commercial/industrial buildings. Generally, impervious surfaces in these areas account for 80 to 100 percent of the total land cover. It is important to note that criteria used to developed the hazard ratings did not take into account the age or type of structures. Older structures often do not conform to modern building and fire codes and do not contain fire detection devices. In addition, many of these structures are also prone to faulty electrical and heating systems. Older residential buildings were also constructed in close proximity to one another without adequate firewall protection, thereby enabling a fire to spread quickly.

While a considerable number of buildings in four downtown cores are relatively old, the buildings within these cities are relatively spread out so that the chances of a large structural fire traveling from one building to another, or to other multiple buildings is fairly low. The most likely scenario in which a conflagration would occur would be from a post-earthquake fire. As noted in Section 5.3.2, a major earthquake on the San Andreas fault could reoccur every 180 to 260 years.

### 5.3.8 Wildland Fire

#### 5.3.8.1 Nature

A wildland fire is a type of wildfire that spreads through consumption of vegetation. It often begins unnoticed, spreads quickly, and is usually signaled by dense smoke that may be visible from miles around. Wildland fires can be caused by human activities (such as arson or campfires) or by natural events such as lightning. Wildland fires often occur in forests or other areas with ample vegetation. In addition to wildland fires, wildfires can be classified as urban fires, interface or intermix fires, and prescribed fires.

The following three factors contribute significantly to wildland fire behavior and can be used to identify wildland fire hazard areas.

- **Topography:** As slope increases, the rate of wildland fire spread increases. South-facing slopes are also subject to more solar radiation, making them drier and thereby intensifying wildland fire behavior. However, ridgetops may mark the end of wildland fire spread, since fire spreads more slowly or may even be unable to spread downhill.
- **Fuel:** The type and condition of vegetation plays a significant role in the occurrence and spread of wildland fires. Certain types of plants are more susceptible to burning or will burn with greater intensity. Dense or overgrown vegetation increases the amount of combustible material available to fuel the fire (referred to as the “fuel load”). The ratio of living to dead plant matter is also important. The risk of fire is increased significantly during periods of prolonged drought as the moisture content of both living and dead plant matter decreases. The fuel’s continuity, both horizontally and vertically, is also an important factor.
- **Weather:** The most variable factor affecting wildland fire behavior is weather. Temperature, humidity, wind, and lightning can affect chances for ignition and spread of fire. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildland fire activity. By contrast, cooling and higher humidity often signal reduced wildland fire occurrence and easier containment.

The frequency and severity of wildland fires is also dependent on other hazards, such as lightning, drought, and infestations (such as the damage to Southern California alpine forests by the pine bark beetle). If not promptly controlled, wildland fires may grow into an emergency or disaster. Even small fires can threaten lives and resources and destroy improved properties. In addition to affecting people, wildland fires may severely affect livestock and pets. Such events may require emergency watering/feeding, evacuation, and shelter.

The indirect effects of wildland fires can 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 capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams, thereby enhancing flood potential, harming aquatic life, and degrading water quality. Lands stripped of vegetation are also subject to increased debris flow hazards.

### 5.3.8.2 History

According to the California Department of Forestry and Fire Protection (CDF), CDF and the U.S. Forest Service (USFS) have responded to over 263 wildland fires in the county since 1922 (See Figure C-11, Appendix C). Table 5-6, shows these fires larger than 5,000 acres.

**Table 5-6 Historic Large Mendocino County Wildland Fires, 1922–2006**

Year	Fire Name	Agency	Acres Burned
1987	Mendenhall	CDF	65,468
1931	Comptche	CDF	33,101
1945	Will Creek	CDF	30,725
1950	Strong Mountain	CDF	20,619
2006	Hunter	USFS	16,234
1923	Streeter Ridge	USFS	14,996
1945	Hayworth Ridge	CDF	14,943
1932	Hayshed	USFS	10,045
1944	Ironles #2	CDF	9,537
1950	Irene Peak	CDF	8,956
1952	----	CDF	8,645
1932	Horse Pasture Ridge	USFS	8,423
1955	Mud Springs	CDF	8,234
1945	Tomki Creek	CDF	8,109
1973	Doghouse	CDF	8,059
1939	Salmon Creek	USFS	8,049
1944	Foster Mountain	CDF	6,990
1966	Horse	USFS	6,974
1939	Thatcher Creek	USFS	6,638
1950	Rancheria Creek	CDF	6,515
1944	Alaska Ridge	CDF	6,152
1946	Newhall	USFS	6,141
1939	Pine Ridge	USFS	6,043
1972	Mud Springs	CDF	5,450
1959	Kelly	CDF	5,371
1944	Cold Springs	CDF	5,283
1995	Guntley	CDF	5,187
1950	N.W.P.Rr #20a	CDF	5,185
1945	Point Arena Series	CDF	5,160

CDF = California Department of Forestry and Fire Protection, USFS = U.S. Forest Service.

### 5.3.8.3 Location, Extent, and Probability of Future Events

Figure C-12 (Appendix C) displays both the location and extent of wildland fire hazard areas for the county. This map is based on the California Fire and Resource Assessment Program fuel rank model. This model ranks the fuel type, slope, and ladder and/or crown fuel present from 1911–

2005 to determine potential exposure to wildfire hazard areas. As such, mountainous, highly combustible areas in and around the Mendocino National Forest have a Fire and Resource Assessment Program fuel ranking of high and very high and therefore are most susceptible to wildland fires. In fact, 20 percent of wildland fires in the county in the 75 years have been in the national forest. Areas at risk also include the Wildland-Urban Interface (WUI). The WUI is composed of both interface and intermix communities. In both interface and intermix communities, housing must meet or exceed a minimum density of one structure per 40 acres. For intermix communities, wildland vegetation is continuous, with more than 50 percent vegetation, while interface communities are areas with housing in the vicinity of contiguous vegetation and have less than 50 percent vegetation. Within the county, the WUI communities at greatest risk to a wildland fire include: Piercy, Westport, Leggett, Branscomb, Comptche, Gualala, and Laytonville. In addition, it is important to note that even non-WUI communities are also susceptible to wildland fires. A main fire that burns from WUI into the urban environs can produce spot fires that then produce ember showers and more spotting.

Generally, fire susceptibility dramatically increases in the late summer and early autumn as vegetation dries out, decreasing plant moisture content and increasing the ratio of dead fuel to living fuel. However, various other factors, including humidity, wind speed and direction, fuel load and fuel type, and topography, can contribute to the intensity and spread of wildland fires. The common causes of wildland fires in California include arson and negligence. Based on previous occurrences, Mendocino County can expect a wildland fire of over 500 acres to occur about every 2.5 years.

This section provides an overview of the vulnerability analysis and describes the five specific steps: asset inventory, methodology, data limitations and exposure analysis for current assets, and areas of future development. County- and city-specific asset inventory and exposure analysis tables are listed in Appendices H through L.

**6.1 OVERVIEW OF VULNERABILITY ANALYSIS**

A vulnerability analysis predicts the extent of exposure that may result from a hazard event of a given intensity in a given area. The analysis provides quantitative data that may be used to identify and prioritize potential mitigation measures by allowing communities to focus attention on areas with the greatest risk of damage. A vulnerability analysis is divided into five steps: including asset inventory, methodology, data limitations and exposure analysis for current assets, and areas of future development.

The requirements for a vulnerability analysis as stipulated in DMA 2000 and its implementing regulations are described below.

- A summary of the community’s vulnerability to each hazard that addresses the impact of each hazard on the community.

**DMA 2000 and FMA Requirements: Risk Assessment, Assessing Vulnerability, Overview**

**Assessing Vulnerability: Overview**

**Requirement §201.6(c)(2)(ii):** [The risk assessment shall include 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.

**FMA Requirement §78.5(b):** Description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential.

**Element**

- Does the plan include an overall summary description of the jurisdiction’s vulnerability to each hazard?
- Does the plan address the impact of each hazard on the jurisdiction?

Source: FEMA, March 2004.

- An identification of the types and numbers of existing vulnerable buildings, infrastructure, and critical facilities and, *if possible*, the types and numbers of vulnerable future development.

**DMA 2000 and FMA Recommendations: Risk Assessment, Assessing Vulnerability, Identifying Structures**

**Assessing Vulnerability: Identifying Structures**

**Requirement §201.6(c)(2)(ii)(A):** The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.

**FMA Requirement §78.5(b):** Description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential.

**Element**

- Does the plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?

DMA 2000 and FMA Recommendations: Risk Assessment, Assessing Vulnerability, Identifying Structures

- Does the plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

Source: FEMA, March 2004.

- Estimate of potential dollar losses to vulnerable structures and the methodology used to prepare the estimate.

DMA 2000 and FMA Recommendations: Risk Assessment, Assessing Vulnerability, Estimating Potential Losses

Assessing Vulnerability: Estimating Potential Losses

**Requirement §201.6(c)(2)(ii)(B):** [The plan should describe vulnerability in terms of 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.

Element

- Does the plan estimate potential dollar losses to vulnerable structures?
- Does the plan describe the methodology used to prepare the estimate?

Source: FEMA, March 2004.

- Assess each jurisdiction’s risks where they vary from the risks facing the entire planning area.

DMA 2000 and FMA Recommendations: Multi-Jurisdictional Risk Assessment

Assessing Vulnerability: Multi-Jurisdictional Risk Assessment

**Requirement §201.6(c)(2)(iii):** For multi-jurisdictional plans, the risk assessment **must** assess each jurisdiction’s risks where they vary from the risks facing the entire planning area

**FMA FEMA 299 Guidance:** The Plan should be coordinated with, and ideally developed in cooperation with, all of the local jurisdictions within the geographical area.

Element

- Does the plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?

Source: FEMA, March 2004.

**6.2 VULNERABILITY ANALYSIS: SPECIFIC STEPS**

**6.2.1 Asset Inventory**

Asset inventory is the first step of a vulnerability analysis. Assets within each community that may be affected by hazard events include population, residential and nonresidential buildings, and critical facilities and infrastructure. The assets and insured values throughout all of Mendocino County are identified and discussed in detail below. As noted above, community-specific asset inventory lists are located in Tables H-1 through L-1 in Appendices H through L, respectively.

**6.2.1.1 Population and Building Stock**

Population data for all of Mendocino County were obtained from the 2000 U.S. Census, which was collected at the census block level. Mendocino County’s total population for 2000 was 86,265 and was estimated to be 88,276 for 2005 (Table 6-1). Population density throughout Mendocino County is shown on Figure C-13 (Appendix C).

**Table 6-1 Countywide Estimated Population and Building Inventory**

Population		Residential Buildings		Nonresidential Buildings	
2000 Census	Estimated 2005 Census	Total Building Count	Total Value of Buildings (\$)¹	Total Building Count	Total Value of Buildings (\$)²
86,265	88,276	31,340	5,055,864,000	274	861,568,000

**Sources:** FEMA HAZUS-MH, Version 2006 and U.S. Census 2000.

¹ Average insured structural value of all residential buildings (including single-family dwellings, mobile homes, etc.) is \$161,000 per structure.

² Average insured structural value of all nonresidential buildings (including industry, trade, professional and technical services, etc.) is \$3,144,000.

Estimated numbers of residential and nonresidential buildings and replacement values for those structures, as shown in Table 6-1, were obtained from HAZUS, FEMA’s hazard identification software program and the 2000 U.S. Census. A total of 31,340 residential buildings were considered in this analysis, including single-family dwellings, mobile homes, multifamily dwellings, temporary lodgings, and institutional dormitory facilities. A total of 274 nonresidential buildings were also analyzed, including industry, retail trade, wholesale trade, personal and repair services, professional and technical services, banks, medical offices, religious centers, entertainment and recreational facilities, theaters, and parking facilities. The total number of nonresidential buildings captured by HAZUS appeared to be only approximately 50 percent of the total number of nonresidential buildings throughout the county.

**6.2.1.2 Repetitive Loss Properties**

RL properties are properties that suffer from repeated flooding. FEMA defines a RL property as a property with at least two \$1,000 claims within any 10-year period since 1978. SRL properties have been identified by FEMA as most at risk for repeat flooding. These properties include every property that since 1978 has experienced: four or more separate building and content claims each exceeding \$5,000 with cumulative claims exceeding \$20,000, or at least two separate building claims with cumulative losses exceeding the value of the property (that is, the value of the structure). Table 6-2 and Figure C-14 show the three RL properties located within the county. Addresses for both RL and SRL properties are not included in this plan, but are kept on file with the floodplain managers in Mendocino County and Willits.

**Table 6-2 Countywide Repetitive Loss Properties**

Type	Community	Occupancy	No. of Losses	Flood Insurance	Value (\$) <sup>1</sup>	Total Claims (\$) <sup>2</sup>
RL	Navarro	Single Family	3	Yes	166,739	153,811
RL	Ukiah (unincorporated)	Single Family	2	No	131,137	14,280
RL	Willits	Nonresidential	2	No	160,870	35,315

Source: FEMA SQANet.

<sup>1</sup> Insured structural value as of 9/30/2007.

<sup>2</sup> Content and building claims.

**6.2.1.3 Critical Facilities and Infrastructure**

A critical facility is defined as a local (non-State or Federal) facility in either the public or private sector that provides essential products and services to the general public, such as preserving the quality of life in Mendocino County and fulfilling important public safety, emergency response, and disaster recovery functions. The critical facilities profiled in this plan include the following:

- Government facilities, such as departments, agencies, and administrative offices
- Emergency response facilities, including police, fire, and Emergency Operations Centers
- Educational facilities, including K-12
- Care facilities, such as congregate living health, residential care, and continuing care retirement facilities
- Community gathering places, such as parks, museums, libraries, and senior centers

The total number of critical facilities within the county is listed in Table 6-3 and shown on Figure C-15 (Appendix C). Community-specific critical facilities are listed in Tables H-2 through L-2 in Appendices H through L, respectively.

Similar to critical facilities, critical infrastructure includes infrastructure that is essential to preserving the quality of life and safety in the county. Critical infrastructure profiled in this plan includes the following:

- State and Federal Highways
- Railroad Tracks
- Local, State, and Federal bridges
- Utilities, including communication (cell, radio, and television), water and wastewater, and power facilities.

**Table 6-3 Countywide Critical Facilities and Infrastructure**

	Total Structures/Total Miles	Total Value (\$)*
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Table 6-3 Countywide Critical Facilities and Infrastructure

		Total Structures/Total Miles	Total Value (\$)*
Facility	Government	64	95,626,299
	Emergency Response	28	30,011,000
	Educational	84	49,560,000
	Care	6	16,755,906
	Community	38	13,706,684
Infrastructure	Federal and State Highways	367 Miles	1,907,759,585
	Railroads	159 Miles	220,263,336
	Bridges	359	509,958,608
	Ground and Air Facilities	13	160,882,695
	Utilities	94	490,128,761
	Dams	24	NA

Sources: FEMA HAZUS-MH, local jurisdictions.

\* Estimated and/or insured structural value for critical facilities and estimated values for critical infrastructure.

NA = Not Available.

## 6.2.2 Methodology

A conservative exposure-level analysis was conducted to assess the risks of the identified hazards. This analysis is a simplified assessment of the potential effects of the hazards on values at risk without consideration of probability or level of damage.

Using GIS, the building footprints of critical facilities were compared to locations where hazards are likely to occur. If any portion of the critical facility fell within a hazard area, it was counted as impacted. Using census block level information, a spatial proportion was used to determine the percentage of the population and residential and nonresidential structures located where hazards are likely to occur. Census blocks that are completely within the boundary of a hazard area were determined to be vulnerable and were totaled. A spatial proportion was also used to determine the amount of linear assets, such as highways, within a hazard area. The exposure analysis for linear assets was measured in miles.

Replacement values or insurance coverage were developed for physical assets. These values were obtained from HAZUS-MH or provided by the local jurisdiction. For facilities that didn't have specific values per building in a multibuilding scenario (e.g., schools), the buildings were grouped together and assigned one value. For each physical asset located within a hazard area, exposure was calculated by assuming the worst-case scenario (that is, the asset would be completely destroyed and would have to be replaced). Finally, the aggregate exposure, in terms of replacement value or insurance coverage, for each category of structure or facility was calculated. A similar analysis was used to evaluate the proportion of the population at risk. However, the analysis simply represents the number of people at risk; no estimate of the number of potential injuries or deaths was prepared.

### 6.2.3 Data Limitations

The vulnerability estimates provided herein use the best data currently available, and the methodologies applied result in an approximation of risk. These estimates may be used to understand relative risk from hazards and potential losses. However, uncertainties are inherent in any loss estimation methodology, arising in part from incomplete scientific knowledge concerning hazards and their effects on the built environment as well as the use of approximations and simplifications that are necessary for a comprehensive analysis.

It is also important to note that the quantitative vulnerability assessment results are limited to the exposure of people, buildings, and critical facilities and infrastructure to the identified hazards. It was beyond the scope of this MHMP to develop a more detailed or comprehensive assessment of risk (including annualized losses, people injured or killed, shelter requirements, loss of facility/system function, and economic losses). Such impacts may be addressed with future updates of the MHMP.

### 6.2.4 Exposure Analysis

The results of the exposure analysis for loss estimations in Mendocino County are summarized in Tables 6-4, 6-5, and 6-6 and in the following discussion. The results of the exposure analysis for the participating communities (including the Special Districts) are located in Tables H-3, H-4, and H-5 through Tables L-3, L-4, and L-5 in Appendices H through L, respectively. In addition, Table 6 within the jurisdictional-specific appendices lists the critical facilities and the specific hazard areas in which each facility is located.

**Table 6-4 Countywide Potential Hazard Exposure Analysis Overview – Population and Buildings**

Hazard Type	Hazard Area	Methodology	Population Number	Buildings					
				Residential		Nonresidential		Repetitive Loss Properties	
				No.	Value (\$)*	No.	Value (\$)*	No.	Value (\$)*
Dam Failure	High	Inundation area	12,864	3,496	572,489,000	92	251,918,000	NA	NA
Earthquake	Very strong	20-40% (g)	8,743	3,587	518,680,000	8	48,681,000	NA	NA
	Severe	>40-60% (g)	63,074	22,367	3,752,096,000	227	680,783,000	NA	NA
	Violent	>60-80% (g)	14,250	5,217	752,468,000	37	126,205,000	NA	NA
Flood	Moderate	500-year floodplain	1,508	411	71,059,000	6	19,048,000	NA	NA
	High	100-year floodplain	7,237	2,199	354,526,000	23	73,001,000	3	458,746
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	32,085	10,016	1,673,632,000	203	587,343,000	NA	NA
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	2,050	428	95,614,000	1	7,284,000	NA	NA
Landslide	Low	0-14 degrees	72,755	25,358	4,142,588,000	251	768,028,000	NA	NA
	Moderate	>14-32 degrees	12,448	5,453	833,647,000	20	79,390,000	NA	NA
	High	>32-56 degrees	1,075	492	75,364,000	3	9,986,000	NA	NA
Tsunami	Moderate	10-foot maximum run-up area	13,555	5,569	982,566,000	59	179,562,000	NA	NA
Urban Conflagration	Low	Low developed density	17,435	5,104	888,298,000	66	182,091,000	NA	NA
	Moderate	Moderate developed density	11,273	3,156	578,456,000	91	242,457,000	NA	NA
	High	High developed density	447	137	24,816,000	14	40,569,000	NA	NA
Wildland Fire	Low	Low fuel rank	10,887	3,648	555,309,000	27	114,569,000	NA	NA
	Moderate	Moderate fuel rank	50,811	16,582	2,779,749,000	209	588,073,000	NA	NA
	High	High fuel rank	18,396	8,294	1,286,270,000	26	108,289,000	NA	NA
	Very High	Very high fuel rank	6,089	2,756	422,017,000	12	46,858,000	NA	NA

\*Estimated and/or insured structural value.  
NA = Not applicable.

**Table 6-5 Countywide Potential Hazard Exposure Analysis Overview – Critical Facilities**

Hazard Type	Hazard Area	Methodology	Government		Emergency Response		Educational		Care		Community	
			No.	Value (\$)*	No.	Value (\$)*	No.	Value (\$)*	No.	Value (\$)*	No.	Value (\$)*
Dam Failure	High	Inundation area	16	10,977,434	2	1,416,000	8	4,720,000	1	8,260,000	5	1,907,585
Earthquake	Very strong	20-40% (g)	2	3,053,833	4	2,832,000	10	5,900,000	0	0	3	515,573
	Severe	>40-60% (g)	55	86,706,231	18	21,043,000	62	36,580,000	5	12,625,906	26	10,334,574
	Violent	>60-80% (g)	7	5,866,235	6	6,136,000	12	7,080,000	1	4,130,000	9	2,856,537
Flood	Moderate	500-year floodplain	2	1,820,261	0	0	0	0	0	0	0	0
	High	100-year floodplain	2	2,360,000	1	708,000	6	3,540,000	0	0	6	3,462,483
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	45	61,565,401	22	23,875,000	37	21,830,000	5	15,334,216	25	8,280,870
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	3	2,849,261	0	0	1	590,000	0	0	2	474,476
Landslide	Low	0-14 degrees	64	95,626,299	27	29,303,000	81	47,790,000	6	42,345,906	37	13,469,446
	Moderate	>14-32 degrees	0	0	1	708,000	2	1,180,000	0	0	0	0
	High	>32-56 degrees	0	0	0	0	1	590,000	0	0	1	237,238
Tsunami	Moderate	10-foot maximum run-up area	0	0	0	0	0	0	0	0	1	2,300,000
Urban Conflagration	Low	Low developed density	23	34,831,981	10	12,312,000	32	18,880,000	3	6,973,380	13	5,713,717
	Moderate	Moderate developed density	23	34,967,437	7	8,023,000	16	9,440,000	2	1,522,526	8	4,766,940
	High	High developed density	6	8,994,293	0	0	2	1,180,000	1	8,260,000	0	0
Wildland Fire	Low	Low fuel rank	11	7,348,150	3	2,124,000	19	11,210,000	0	0	5	1,171,541
	Moderate	Moderate fuel rank	50	70,215,714	19	22,536,000	58	34,220,000	6	16,755,906	26	9,048,953
	High	High fuel rank	2	17,855,291	5	3,699,000	7	4,130,000	0	0	4	2,774,476
	Very High	Very high fuel rank	1	207,144	1	1,652,000	0	0	0	0	3	711,714

\*Estimated and/or insured structural value.

**Table 6-6 Countywide Potential Hazard Exposure Analysis Overview – Critical Infrastructure**

Hazard Type	Hazard Area	Methodology	Highways		Railroads		Bridges		G&A Facilities		Utilities		Dams	
			Miles	Value (\$)*	Miles	Value (\$)*	No.	Value (\$)*	No.	Value (\$)*	No.	Value (\$)*	No.	Value (\$)*
Dam Failure	High	Inundation area	28.62	148,774,058	59.12	81,899,172	68	97,407,824	0	0	0	0	2	NA
Earthquake	Very strong	20-40% (g)	104.11	541,190,328	22.29	30,878,426	85	121,759,780	1	6,431,000	12	1,416,000	5	NA
	Severe	>40-60% (g)	211.84	1,101,198,339	92.9	128,694,742	210	300,818,280	5	77,172,000	37	161,306,000	16	NA
	Violent	>60-80% (g)	35.54	184,745,983	28.32	39,231,809	33	47,271,444	2	12,862,000	12	2,478,000	1	NA
Flood	Moderate	500-year floodplain	0.95	4,938,342	2.29	3,172,346	2	2,864,936	0	0	1	78,588,000	0	NA
	High	100-year floodplain	31.12	161,769,696	56.16	77,798,673	71	101,705,228	0	0	0	0	4	NA
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	353.43	1,837,219,265	143.51	198,804,977	190	272,168,920	3	64,310,000	7	79,296,000	1	NA
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	0.6	3,118,953	0.75	1,038,978	5	7,162,340	0	0	0	0	0	NA
Landslide	Low	0-14 degrees	246.6	1,281,889,683	100.28	138,918,285	237	339,494,916	8	96,465,000	41	162,840,000	21	NA
	Moderate	>14-32 degrees	97.95	509,169,077	38.86	53,832,913	75	107,435,100	0	0	19	2,242,000	1	NA
	High	>32-56 degrees	8.88	46,160,504	4.38	6,067,632	21	30,081,828	0	0	1	118,000	0	NA
Tsunami	Moderate	10-foot maximum run-up area	6.08	31,605,390	2.08	2,881,432	15	21,487,020	0	0	0	0	0	NA
Urban Conflagration	Low	Low developed density	52.56	273,220,283	2.95	4,086,647	34	48,703,912	3	38,586,000	4	78,942,000	1	NA
	Moderate	Moderate developed density	4.06	21,104,915	1.66	2,299,605	6	8,594,808	1	6,431,000	1	118,000	0	NA
	High	High developed density	0.06	311,895	0.44	609,534	1	1,432,468	0	0	1	118,000	0	NA
Wildland Fire	Low	Low fuel rank	49.43	256,949,745	28.02	38,816,218	90	128,922,120	3	38,586,000	3	78,824,000	6	NA
	Moderate	Moderate fuel rank	122.58	637,202,098	41.54	57,545,528	90	128,922,120	3	19,293,000	20	80,830,000	11	NA
	High	High fuel rank	141.26	734,305,501	59.52	82,453,294	119	170,463,692	1	25,724,000	25	2,950,000	5	NA
	Very high	Very high fuel rank	39.99	207,878,217	14.41	19,962,231	34	48,703,912	1	12,862,000	13	2,596,000	0	NA

\*Estimated value.  
NA = Not available.

### *Dam Failure*

The State of California regulates and inventories dams measuring greater than 25 feet in height and retaining greater than 15 acre-feet of water, or those dams that are more than 6 feet in height and retaining greater than 50 acre-feet of water. Inundation maps were developed for larger dams. Critical facilities, infrastructure, and other buildings within the inundation area are considered to be in a high hazard area in the event of dam failure.

Countywide there are 3,496 residential structures (worth \$572,489,000), 92 nonresidential buildings (worth \$251,918,000), and an estimated population of 12,864 within the inundation area. In the high hazard area there are 16 government facilities (worth \$10,977,434), 2 emergency response facilities (worth \$1,416,000), 8 educational facilities (worth \$4.72 million), 1 care facility (worth \$8.26 million), 5 community facilities (worth \$1,907,585), 68 bridges (worth \$97,407,824), 59.1 miles of rail (worth \$81,899,172), and 28.6 miles of highway (worth \$148,774,058). Five dams (values unavailable) also have a high risk of failure.

### *Earthquake*

PGA shake maps produced by the USGS show that county wide there are several critical facilities that fall within a very strong shaking range (20 to 40 percent acceleration due to gravity), including 2 government facilities (worth \$3,053,833), 4 emergency response facilities (worth \$2,832,000), 10 educational facilities (worth \$5,900,000), 3 community facilities (worth \$515,573), 1 ground and air facility (worth \$6,431,000), and 12 utilities (worth \$1,416,000). There are also 85 bridges (worth \$121,759,780), 22.29 miles of rail (worth \$30,878,426), 104.11 miles of highway (worth \$541,190,328), and 5 dams (values unknown). Residential buildings in the very strong shaking range total 3,587 (worth \$518,680,000), 8 nonresidential buildings (worth \$48,681,000), and an estimated population of 8,743.

In a severe shaking range (40 to 60 percent acceleration due to gravity), there are 55 government facilities (worth \$86,706,231), 18 emergency response facilities (worth \$21,043,000), 62 educational facilities (worth \$36.58 million), 5 care facilities worth \$12,625,906), 26 community facilities (worth \$10,334,574), 37 utilities (worth \$161,306,000), and 5 ground and air facilities (worth \$77,172,000). Critical infrastructure located in the severe shaking range includes 210 bridges (worth \$300,818,280), 92.9 miles of rail (worth \$128,694,742), 211.84 miles of highway (worth \$1,101,198,339), and 16 dams (values unavailable). Within the severe shaking range there are 22,367 residences (worth \$3,752,096,000), 227 nonresidential buildings (worth \$680,783,000), and approximately 63,074 people.

There are 5,217 residences (worth \$752,468,000), 37 nonresidential buildings (worth \$126,205,000), and an estimated 14,250 people located within a violent shaking range area (60 to 80 percent acceleration due to gravity). Critical facilities are also located in this shaking range including 7 government facilities (worth \$5,866,235), 6 emergency response facilities (worth \$6,136,000), 12 educational facilities (worth \$7.08 million), 1 care facility (worth \$4.13 million), 9 community facilities (worth \$2,856,537), 12 utilities (worth \$2,478,000), 2 ground and air facilities (worth \$12,862,000), 33 bridges (worth \$47,271,444), 28.32 miles of rail (worth \$39,231,809), and 35.54 miles of highway (worth \$184,745,983). The Brooktrails 3N, Centennial, and Morris dams (values unknown) are also located in the violent shaking range for earthquake.

### *Flood*

According to the FIRM, last updated for Mendocino County in January 1992, 2 government facilities (worth \$2.36 million), 1 care facility (worth \$708,000), 6 educational facilities (worth \$1.77 million), 6 community facilities (worth \$3,462,483), 71 bridges (worth \$101,705,228), 56.16 miles of rail (worth \$77,798,673), 31.12 miles of highway (worth \$161,769,696), as well as 4 dams (values unknown) are within the 100-year floodplain. There are 2,199 residential buildings (worth \$354,526,000), 23 nonresidential building (worth \$73,001,000), and an estimated population of 7,237 people located within the 100-year floodplain. There are also 3 RL properties located in the 100-year floodplain. These structures are discussed in greater detail the Mendocino County and Willits appendices. Facilities, utilities, infrastructure, and other buildings within the 100-year floodplain have a 1 percent probability of occurrence in any given year and are considered to be at high risk of flooding.

A moderate risk is assigned to facilities, utilities, and other buildings within the 500-year floodplain. Countywide, there is 0.95 mile of highway (worth \$4,938,342), 2.29 miles of rail (worth \$3,172,346), 2 bridges (worth \$2,864,936), 1 care facility (worth \$78,588,000), and 2 government facilities (worth \$1,820,261). In addition, there are 411 residential structures (worth \$71,059,000), 6 nonresidential building (worth \$19,048,000), and an estimated population of 1,508 people located in the moderate risk (500-year floodplain) area.

### *Hazardous Materials Event*

Using the National Response Center and the EPA's Environmental Facts Multisystem Query to locate hazardous waste handling facilities and businesses that generate hazardous waste from their activities, we can determine that 10,016 residences (worth \$1,673,632,000), 203 nonresidential buildings (worth \$587,343,000), and an estimated 32,085 people are located within ¼ mile of transportation routes countywide, putting them at risk to exposure of a hazardous materials event. There are 45 government facilities (worth \$61,565,401), 22 emergency response facilities (worth \$23,875,000), 37 educational facilities (worth \$21,830,000), 5 care facilities (worth \$15,334,216), 25 community facilities (worth \$8,280,870), 7 utilities (worth \$79,296,000), 353.43 miles of highway (worth \$1,837,219,265), 143.51 miles of rail (worth \$198,804,977), 190 bridges (worth \$272,168,920), and 1 dam (value unknown) within this buffer zone as well.

There are 3 government facilities (worth \$2,849,261), 1 school (worth \$590,000), 2 community facilities (worth \$474,476), 0.6 mile of highway (worth \$3,118,953), 0.75 mile of rail (worth \$1,038,978), and 5 bridges (worth \$7,162,340) are located within ¼ mile of EHS sites. There are 428 residences valued at \$95,614,000, 1 nonresidential building (worth \$7,284,000), and an estimated 2,050 people within this buffer zone as well.

### *Landslide*

USGS elevation datasets were used to determine the risk of landslides in Mendocino County. The slope inclination data assigns landslide potentials at 0 to 14 degrees (0 to 25 percent) (low), 14 to 32 degrees (25 to 65 percent) (medium), and 32 to 72 degrees (65 percent and above) (high). In general, a greater risk of landslides can be found in the northern portion of the county along highways 101 and 1, along seaside bluffs on the western coast of the county and along

instable slopes in the eastern portion of the county. This analysis reveals that approximately 72,755 people are situated in an area of low risk to this hazard with 25,358 residences (worth \$4,142,588,000) and 251 nonresidential buildings (worth \$768,028,000). Within an area of low risk to this hazard there are 64 government facilities (worth \$95,626,299), 27 emergency response facilities (worth \$29,303,000), 81 educational facilities (worth \$47.79 million), 6 care facilities (worth \$42,345,906), 37 community facilities (worth \$13,469,446), 41 utilities (worth \$162.84 million), and 8 ground and air facilities (worth \$96,465,000). There are also 237 bridges (worth \$339,494,916), 100.28 miles of rail (worth \$138,918,285), 246.6 miles of highway (worth \$1,281,889,683), and 21 dams (values unknown).

There are 2 schools (worth \$1,180,000), 1 emergency response facility (worth \$708,000), 19 utilities (worth \$2,242,000), 75 bridges (worth \$107,435,100), 38.86 miles of rail (worth \$53,832,913), 97.95 miles of highway (worth \$509,169,077), and 1 dam (value unknown) are located in a moderate landslide risk area. Also in this area are 5,453 residences valued at \$833,647,000, 20 nonresidential buildings (worth \$79,390,000), and an estimated 12,448 people.

One education facility (worth \$590,000), 1 community facility (worth \$237,238), 1 utility (worth \$118,000), 21 bridges (worth \$30,081,828), 4.38 miles of rail (worth \$6,067,632), and 8.88 miles of highway (worth \$46,160,504) are located in a high landslide risk area. Also in this area are 492 residences valued at \$75,364,000, 3 nonresidential buildings (worth \$9,986,000), and an estimated 1,075 people.

### *Tsunami*

A 10-foot maximum run-up area was used to categorize moderate risk to facilities, infrastructure, and other buildings based on NOAA models for maximum run-up future scenarios. There are 5,569 residences (worth \$982,566,000), 59 nonresidential buildings (worth \$179,562,000), and an estimated 13,555 people located in this moderate risk area. Critical facilities and infrastructure in this run-up area include 1 community facility (worth \$2.3 million), 6.08 miles of highway (worth \$31,605,390), 2.08 miles of rail (worth \$2,881,432), and 15 bridges (worth \$21,487,020).

### *Urban Conflagration*

Intensity of development, determined by the percentage of impervious surfaces, determines the risk of urban conflagration. Impervious surfaces accounting for 20 to 49 percent of total cover is considered low developed density and facilities, infrastructure, and other buildings categorized as such are at low risk to this hazard. There are 23 government facilities (worth \$34,831,981), 10 emergency response facilities (worth \$12,312,000), 32 educational facilities (worth \$18.88 million), 3 care facilities (worth \$4.13 million), and the RCMS (worth \$1,421,690), 13 community facilities (worth \$5,713,717), 4 utilities (worth \$78,942,000), 3 ground and air facilities (worth \$38,586,000), 34 bridges (worth \$48,703,912), 2.95 miles of rail (worth \$4,086,647), 52.56 miles of highway (worth \$273,220,283) and 1 dam (value unknown) in an area of low risk to this hazard. There are 5,104 residences (worth \$888,298,000), 66 nonresidential buildings (worth \$182,091,000), and an estimated population of 17,435 people located in the low risk hazard area.

Moderate developed density includes areas with impervious surfaces accounting for 50 to 79 percent of total cover and facilities, infrastructure, and other buildings categorized as such are at moderate risk to this hazard. Critical facilities in moderate developed densities include 23

government facilities (worth \$34,967,437), 7 emergency response facilities (worth \$8,023,000), 16 educational facilities (worth \$9.44 million), 2 care facilities including the South Coast Senior Center (worth \$1,421,690) and the Mendocino Coast Clinics (worth \$100,836), 8 community facilities (worth \$4,766,940), 1 utility (worth \$118,000), 1 ground and air facility (worth \$6,431,000), 6 bridges (worth \$8,594,808), 1.66 miles of rail (worth \$2,299,605), and 4.06 miles of highway (worth \$21,104,915) are at moderate risk to urban conflagration. There are 3,156 residences (worth \$578,456,000), 91 nonresidential facilities (worth \$242,457,000), and an estimated 11,273 people in the moderate risk area for urban conflagration.

Areas with a high risk to urban conflagration include high density areas with large numbers of people who reside and/or work in areas with impervious surfaces that account for 80 to 100 percent of total cover. There are 137 residences valued at \$24,816,000, 14 nonresidential buildings (worth \$40,569,000), and an estimated population of 447 in the high risk area for this hazard. Critical facilities and infrastructure at high risk to this hazard includes 1 utility (worth \$118,000), 6 government facilities (worth \$8,994,293), 2 education facilities (worth \$1.18 million), 1 care facility (worth \$8.26 million), 0.06 mile of highway (worth \$311,895), 0.44 mile of railroad (worth \$609,534), and 1 bridge (worth \$1,432,468).

### *Wildland Fire*

Wildland fire hazard areas were identified for this plan by determining the amount of fuel in a given area. The wildland fire model takes into account slope, aspect, and fuel to determine the ranking. This model indicates that in the low risk area for wildland fire there are 11 government facilities (worth \$7,348,150), 3 emergency response facilities (worth \$2,124,000), 19 educational facilities (worth \$11.21 million), 5 community facilities (worth \$1,171,541), 3 ground and air facilities (worth \$38,586,000), 3 utilities (worth \$78,824,000), 49.43 miles of highway (worth \$256,949,745), 28.02 miles of rail (worth \$38,816,218), 90 bridges (worth \$128,922,120), and 6 dams (values unknown). There are also 3,648 residences (worth \$555,309,000) and 27 nonresidential buildings valued at \$114,569,000 in the low risk area for this hazard. The estimated population in this low risk area is 10,887.

Within the moderate-risk wildland fire area are 50 government facilities (worth \$70,215,714), 19 emergency response facilities (worth \$22,536,000), 58 educational facilities (worth \$34.22 million), 6 care facilities (worth \$16,755,906), 26 community facilities (worth \$9,048,953), 3 ground and air facilities (worth \$19,293,000), 20 utilities (worth \$80.83 million), 90 bridges (worth \$128,922,120), 41.54 miles of rail (worth \$57,545,528), 122.58 miles of highway (worth \$637,202,098), and 11 dams (values unknown). There are approximately 50,811 people who live in an area of moderate wildland fire risk with 16,582 homes valued at \$2,779,749,000 and 209 nonresidential buildings worth \$588,073,000.

In an area with high risk to wildland fire there are approximately 18,396 people with 8,294 residences (worth \$1,286,270,000) and 26 nonresidential building valued at \$108,289,000. Critical facilities include 2 government facilities (worth \$17,855,291), 5 emergency response facilities (worth \$3,699,000), 7 educational facilities (worth \$4.13 million), 4 community facilities (worth \$2,774,476), 25 utilities (worth \$2.95 million), 1 ground and air facility (worth \$25,724,000), 119 bridges (worth \$170,463,692), 59.52 miles of rail (worth \$82,453,294), 141.26 miles of highway (worth \$734,305,501), and 5 dams (values unknown).

In an area with very high risk to wildland fire there are approximately 6,089 people with 2,756 residences (worth \$422,017,000) and 12 nonresidential building valued at \$46,858,000. Critical facilities include 1 government facility (worth \$207,144), 1 emergency response facility (worth \$1,652,000), 3 community facilities (worth \$711,714), 13 utilities (worth \$2,596,000), 1 ground and air facility (worth \$12,862,000), 34 bridges (worth \$48,703,912), 14.41 miles of rail (worth \$19,962,231), and 39.99 miles of highway (worth \$207,878,217).

This section outlines the four-step process for preparing a mitigation strategy including: developing mitigation goals, identifying mitigation actions, evaluating mitigation actions, and implementing mitigation action plans. Within this section the Task Force developed the mitigation goals and potential mitigation actions for the entire county, including Mendocino County and its four incorporated cities. However, the Task Force only prepared the Countywide Mitigation Action Plan within Section 7. As such, county- and city-specific Mitigation Action Plans are provided in Appendices H through L.

## 7.1 DEVELOPING MITIGATION GOALS

The requirements for the local hazard mitigation goals, as stipulated in DMA 2000 and its implementing regulations, are described below.

**DMA 2000 and FMA Requirements: Mitigation Strategy – Local Hazard Mitigation Goals**

**Local Hazard Mitigation Goals**

**Requirement §201.6(c)(3)(i):** [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

**FMA Requirement §78.5(c):** The applicant’s floodplain management goals for the area covered by the plan.

**Element**

- Does the plan include a description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards? (GOALS are long-term; represent what the community wants to achieve, such as “eliminate flood damage,” and are based on the risk assessment findings.)

Source: FEMA, March 2004.

During the third Task Force meeting on October 23, 2007, the Task Force reviewed county and city-specific vulnerability analysis results as a basis for developing the mitigation goals and Table 7-4 actions. Mitigation goals are defined as general guidelines that explain what a community wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide visions. As such, the Task Force developed ten goals to reduce or avoid long-term vulnerabilities to the identified hazards (Table 7-1).

**Table 7-1 Mitigation Goals**

Goal Number	Goal Description
1	Promote disaster-resistant development.
2	Build and support local capacity to enable the public to prepare for, respond to, and recover from disasters.
3	Reduce the possibility of damage and losses due to dam failures.
4	Reduce the possibility of damage and losses due to earthquakes.
5	Reduce the possibility of damage and losses due to floods (and winter storms).
6	Reduce the possibility of damage and losses due to hazardous materials events.
7	Reduce the possibility of damage and losses due to landslides.
8	Reduce the possibility of damage and losses due to tsunamis.
9	Reduce the possibility of damage and losses due to urban conflagrations.
10	Reduce the possibility of damage and losses due to wildland fires.

## 7.2 IDENTIFYING MITIGATION ACTIONS

The requirements for the identification and analysis of mitigation actions, as stipulated in DMA 2000 and its implementing regulations, are described below.

### DMA 2000 and FMA Requirements: Mitigation Strategy - Identification and Analysis of Mitigation Actions

#### Identification and Analysis of Mitigation Actions

**Requirement §201.6(c)(3)(ii):** [The mitigation strategy shall include 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.

**FMA Requirement §78.5(d):** Identification and evaluation of cost-effective and technically feasible mitigation actions considered.

#### Element

- Does the plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?
- Do the identified actions and projects address reducing the effects of hazards on new buildings and infrastructure?
- Do the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure?

Source: FEMA, March 2004.

After establishing the mitigation goals, the Task Force assessed and revised a list of potential mitigation actions. Mitigation actions are activities, measures, or projects that help achieve the goals of a mitigation plan. Mitigation actions are usually grouped into six broad categories: prevention, property protection, public education and awareness, natural resource protection, emergency services, and structural projects. As listed in Table 7-2, the Task Force developed 35 potential mitigation actions, with a particular emphasis placed on projects and programs that reduce the effects of hazards on both new and existing buildings and infrastructure.

**Table 7-2 Mitigation Goals and Potential Actions**

Goals			
Number	Description	Number	Description
1	Promote disaster-resistant development	1.A	Require specialized engineering or building inspection reports prepared by a licensed civil engineer, geotechnical engineer, or building inspector prior to the issuance of building permits in certain hazard areas. For example, within severe and violent shaking areas, require geologic, seismic, and/or soil engineering reports. Or, within high landslide hazard areas or areas susceptible to sliding, require the evaluation of slope stability and the impact of the project on adjacent lands. Or, within high or very high wildland fire areas, establish minimum design and construction standards, including defensible space.
		1.B	Integrate elements from the MHMP into other local planning documents, including the safety element section of general plans, hazard-specific zoning ordinances, and emergency operation plans.
		1.C	Update land acquisition/future development criteria to include a hazard analysis component (similar to flood zones) for earthquakes, landslides, tsunamis, and wildland fires.
2	Build and support local capacity to enable community members to prepare for, respond to, and recover from disasters.	2.A	Develop a sustained public outreach program that encourages consistent hazard mitigation content. For example, consider publishing tsunami inundation maps in telephone books, wildland fire defensible space tips with summer water bills or along highway billboards, and the safe handling and disposal of hazardous waste and chemicals with garbage bills.
		2.B	Develop audience-specific hazard mitigation outreach efforts. Audiences include the elderly, children, tourists, non-English speaking residents, and home and business owners.
		2.C	Develop a community-wide CERT program that also includes a mitigation component.
		2.D	Develop durable and reflectorized road signage that alerts people of hazard areas.
		2.E	Update hazard maps in Mendocino County’s GIS mapping database to include all eight hazards and asset information identified in the MHMP. Develop data-sharing agreements with other local agencies.
		2.F	Retrofit critical infrastructure or mitigate land (e.g., slope stabilization, vegetation management) around critical infrastructure so that the infrastructure provides safe ingress for emergency response vehicles and safe egress for community members before or during a disaster.
3	Reduce the possibility of damage and losses due to dam failures.	3.A	Review and update county inundation maps every 5 years and participate in DSOD mapping updates.
		3.B	Replace or remediate county dams to meet DSOD safety factors (factor of safety greater than 1.1 during seismic shaking).
4	Reduce the possibility of damage and losses due to earthquakes.	4.A	Strengthen, abate, or downgrade in occupancy, any structures that are owned or leased by the county or incorporated communities that do not meet the California Building Code (CBC) requirements for seismic safety or the California Codes Essential Services Building Act.
		4.B	Develop a voluntary building inspection program in which homes and/or businesses are inspected by a building official for weak or poorly anchored parapets, signs, glass, machinery, shelving, fixtures, and other nonstructural elements or architectural detailing that might cause injury if they were to fall or break during an earthquake.
		4.C	Retrofit any critical assets within severe and violent shaking areas (as noted in this MHMP) that do not meet the CBC requirements for seismic safety or the California Codes Essential Services Building Act. Priority for retrofitting should be given to emergency response facilities, schools, and shelters.
		4.D	Limit new development within 1/8-mile on either side of any potentially active fault zone, as defined by the Alquist-Priolo Special Studies Zone Act.
		4.E	Develop an unreinforced masonry grant program to correct problems, such as bracing chimneys, on residential and nonresidential buildings.
		4.F	Identify and strengthen critical infrastructure to meet the Federal Highway Administration’s seismic standards.

**Table 7-2 Mitigation Goals and Potential Actions**

Goals			
Number	Description	Number	Description
5	Reduce the possibility of damage and losses due to floods (and winter storms).	5.A	Explore mitigation opportunities, including acquisition, relocation, and elevation, for the three repetitively flooded properties throughout the county.
		5.B	Continue to participate in the NFIP program by enforcing the floodplain management ordinance to reduce future flood damage. In addition, join the Community Rating System (CRS) program. A community that participates in additional floodplain management activities, such as those outlined in the CRS program, will reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance.
		5.C	Construct engineered rock buttresses at the toe of the slopes of flooding sources that undercut critical infrastructure, including roads and underground sewer and water lines. Acquire property and move critical infrastructure, as necessary.
		5.D	Construct a lightweight fill prism under roads to prevent the slip plain from further movement and subsequent damage to roads.
		5.E	Develop a flood hazard mitigation plan for the County Maintained Road System, which upon completion, will be integrated into the Mendocino County MHMP.
		5.F	Carry out minor flood and stormwater management projects that would reduce damage to infrastructure and residential buildings due to flooding. These projects include the modifying or replacing existing culverts and bridges, upgrading capacity of storm drains, stabilizing streambanks, clearing streambanks of debris and vegetation, and creating of debris or flood/stormwater retention basins in small watersheds.
		5.G	Underground utilities or clear right-of-way for utilities that provide power and communication to critical facilities and are at-risk to failure during a winter storm event.
		5.H	Retrofit wastewater and potable water facilities that subject to flooding. Retrofitting activities may include elevating vulnerable equipment, electrical controls, and other equipment, fastening and sealing manhole covers to prevent floodwater infiltration, and protecting wells and other potable water from infiltration and flood damage by raising controls and well pipes.
6	Reduce the possibility of damage and losses due to hazardous materials events.	6.A	Examine and mitigate critical infrastructure that has been identified as currently being too narrow or having too many tight turns to ensure the safe transportation of truck loads within Mendocino County.
7	Reduce the possibility of damage and losses due to landslides.	7.A	Stabilize landslide-prone areas around access roads to isolated valleys and rural areas through stability improvement measures, including interceptor drains, in situ soil piles, drained earth buttresses, and subdrains.
		7.B	Construct a lightweight fill prism under roads to prevent the slip plain from further movement and subsequent damage to roads.
8	Reduce the possibility of damage and losses due to tsunamis.	8.A	Participate in the Tsunami Ready Program. This new program, sponsored by the National Weather Service, is designed to provide communities with incentives to reduce their tsunami risks.
9	Reduce the possibility of damage and losses due to urban conflagrations.	9.A	Develop an urban fire prevention program that provides grant funding for property owners to update public structures that currently not meet the CBC and California Fire Code.
		9.B	Create a voluntary building inspection program or fire safety program evaluation program in which homes or businesses can be inspected by a building official for faulty pilot lights, overloaded electrical circuits, open containers containing a combustible substance, and other fire hazards.

**Table 7-2 Mitigation Goals and Potential Actions**

<b>Goals</b>			
<b>Number</b>	<b>Description</b>	<b>Number</b>	<b>Description</b>
10	Reduce the possibility of damage and losses due to wildland fires.	10.A	Develop a fire road access/roadside vegetation removal program or fuel break program in which live native vegetation should be thinned and/or moved and dead vegetation should be removed within a 50-foot distance of each side of a road. Roads to be included in this program include those located in high or very high areas of this MHMP or defined by Mendocino County Fire Safe Council.
		10.B	Create a vegetation management program that provides vegetation management services to elderly, disabled, or low-income persons who lack the resources to remove flammable vegetation around their homes.
		10.C	Implement both applied and emerging vegetation management activities along the destructive wildland interface and intermix hazard areas. Examples of activities include creating fuel breaks to separate housing encroachment from brush fields and mechanically constructing fire breaks within brush fields and forests.
		10.D	Develop a countywide chipper program in which local residents and business owners do their own vegetation management and the community offers free or reduced-cost roadside chipping.

**7.3 EVALUATING AND PRIORITIZING MITIGATION ACTIONS**

The requirements for the evaluation and implementation of mitigation actions, as stipulated in DMA 2000 and its implementing regulations, are described below.

**DMA 2000 and FMA Requirements: Mitigation Strategy - Implementation of Mitigation Actions**

**Implementation of Mitigation Actions**

**Requirement: §201.6(c)(3)(iii):** [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) 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.

**FMA Requirement: §78.5(d):** Identification and evaluation of cost-effective and technically feasible mitigation actions considered

**FMA Requirement: §78.5(e):** Presentation of the strategy for reducing flood risks and continued compliance with the NFIP, and procedures for ensuring implementation, reviewing progress, and recommending revisions to the plan.

**Element**

- Does the mitigation strategy include how the actions are prioritized? (For example, is there a discussion of the process and criteria used?)
- Does the mitigation strategy address how the actions will be implemented and administered? (For example, does it identify the responsible department, existing and potential resources, and timeframe?)
- Does the prioritization process include an emphasis on the use of a cost-benefit review (see page 3-36 of *Multi-Hazard Mitigation Planning Guidance*) to maximize benefits?
- Does the mitigation strategy emphasize cost-effective and technically feasible mitigation actions?

Source: FEMA, March 2004.

Once a list of mitigation actions had been approved, the Task Force evaluated and prioritized each of the mitigation actions to determine which actions would be included in the Countywide Mitigation Action Plan, which represents mitigation projects and programs to be implemented throughout the entire county through the cooperation of multiple entities. To complete this task, the Task Force reviewed the simplified STAPLEE evaluation criteria (shown in Table 7-3) and the Benefit-Cost Analysis Fact Sheet (Appendix F) to consider the opportunities and constraints of implementing each particular mitigation action.

**Table 7-3 Evaluation Criteria for Mitigation Actions**

<b>Evaluation Category</b>	<b>Discussion “It is important to consider...”</b>	<b>Considerations</b>
<b>Social</b>	The public support for the overall mitigation strategy and specific mitigation actions.	Community acceptance Adversely affects population
<b>Technical</b>	If the mitigation action is technically feasible and if it is the whole or partial solution.	Technical feasibility Long-term solutions Secondary impacts
<b>Administrative</b>	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.	Staffing Funding allocation Maintenance/operations
<b>Political</b>	What the community and its members feel	Political support

**Table 7-3 Evaluation Criteria for Mitigation Actions**

<b>Evaluation Category</b>	<b>Discussion “It is important to consider...”</b>	<b>Considerations</b>
	about issues related to the environment, economic development, safety, and emergency management.	Local champion Public support
<b>Legal</b>	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations.	Local, State, and Federal authority Potential legal challenge
<b>Economic</b>	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit-Cost Analysis.	Benefit/cost of action Contributes to other economic goals Outside funding required FEMA Benefit-Cost Analysis
<b>Environmental</b>	The impact on the environment because of public desire for a sustainable and environmentally healthy community.	Effect on local flora and fauna Consistent with community environmental goals Consistent with local, State, and Federal laws

Upon review, the Task Force assigned a high priority ranking to actions that best fulfill the goals of the MHMP and are appropriate and feasible for Mendocino County and cities to implement during the 5-year lifespan of this version of the MHMP. As such, the Task Force determined that only the mitigation actions that received a high priority ranking would be included the Countywide Mitigation Action Plan.

**7.4 IMPLEMENTING A MITIGATION ACTION PLAN**

The requirements for the identification of a mitigation action for each participating jurisdiction, as stipulated in DMA 2000 and its implementing regulations, are described below.

**DMA 2000 and FMA Requirements: Mitigation Strategy – Identification of Multi-Jurisdictional Mitigation Actions**

**Identification of Multi-Jurisdictional Mitigation Actions**

**Requirement §201.6(c)(3)(iv):** For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

**FMA FEMA 299 Guidance:** The Plan should be coordinated with, and ideally developed in cooperation with, all of the local jurisdictions, within the geographical area.

**Element**

- Does the plan include at least one identifiable action item for each jurisdiction requesting FEMA approval of the plan?

Source: FEMA, March 2004.

Table 7-4 shows the Countywide Mitigation Action Plan matrix that describes how the mitigation actions were prioritized, how the overall benefit-costs were taken into consideration, and how each mitigation action will be implemented and administered by the Task Force, the county, and cities.

Mendocino County and each of the four cities followed this same process and developed county- and city-specific Mitigation Action Plans. The county- and city-specific Mitigation Action Plans are provided in Appendices H through L.

**Table 7-4 Countywide Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
1.B	Integrate elements from the MHMP into other local planning documents, including the safety element section of general plans, hazard-specific zoning ordinances, and emergency operation plans.	High Priority	Task Force members to work with various departments and agencies within their jurisdiction	General funds	0-2 years	The integration of the MHMP elements into planning documents will help ensure consistency across all types and all phases of planning.
2.A	Develop a sustained public outreach program that encourages consistent hazard mitigation content. For example, consider publishing tsunami inundation maps in telephone books, wildland fire defensible space tips with summer water bills or along highway billboards, and the safe handling and disposal of hazardous waste and chemicals with garbage bills.	High Priority	Public information officers within Mendocino County, Fort Bragg, Point Arena, Ukiah, and Willits	PDM or HMGP funding	Ongoing	A sustained mitigation outreach program will help build and support countywide capacity to enable the public to prepare for, respond to, and recover from disasters.
2.C	Develop communitywide CERT program that also includes a mitigation component.	High Priority	Mendocino County OES	Citizen Corps grants	0-1 year	A sustained community-initiative mitigation program will help build and support countywide capacity to enable the public to prepare for, respond to, and recover from disasters.

**Table 7-4 Countywide Mitigation Action Plan Matrix**

Action Number	Description	Ranking/Prioritization	Administering Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility
5.B*	Continue to participate in the NFIP by enforcing the floodplain management ordinance to reduce future flood damage. In addition, join the Community Rating System (CRS) program. A community that participates in additional floodplain management activities, such as those outlined in the CRS program, will reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance.	High Priority	Floodplain managers within Mendocino County, Fort Bragg, Point Arena, Ukiah, and Willits	FMA, PDM, or HMGP funding for additional floodplain management activities	Ongoing for NFIP, 1-2 years for CRS program	All of the communities participating in this MHMP are active participants of the NFIP. Additional floodplain management activities (i.e.: public outreach material, enhanced floodplain mapping, etc.) can be identified and implemented throughout the county, allowing resources to be shared.
8.A	Participate in the Tsunami Ready Program. This new program, sponsored by the National Weather Service, is designed to provide communities with incentives to reduce their tsunami risks.	High Priority	Mendocino County, Fort Bragg, and Point Arena OES	PDM or HMGP funding	0-1 year	The implementation of national mitigation program is a cost-effective and established way to help build and support local capacity to enable the public to prepare for, respond to, and recover from tsunamis.

**Table 7-4 Countywide Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
10.B	Create a vegetation management program that provides vegetation management services to elderly, disabled, or low-income persons who lack the resources to remove flammable vegetation around their homes.	High Priority	Mendocino County Fire Safe Council	PDM or HMGP funding	0-2 years, then ongoing	This program will help mitigate wildland fire hazards around vulnerable populations. Protecting vulnerable populations from a disaster is FEMA and CDC goal.
10.C	Implement both applied and emerging vegetation management activities along the destructive wildland interface and intermix hazard areas. Examples of activities include creating fuel breaks to separate housing encroachment from brush fields and mechanically constructing fire breaks with brush fields.	High Priority	Mendocino County Fire Safe Council	PDM or HMGP funding	0-2 years, then ongoing	The probability of future damage from wildland fires could be high if this mitigation action is not implemented.

\* RL property mitigation actions are identified in the Mitigation Action Plan Matrices for Mendocino County and the City of Willits.

This section describes a formal plan maintenance process to ensure that the MHMP remains an active and applicable document. It includes an explanation of how Mendocino County OES and the Task Force intend to organize their efforts to ensure that improvements and revisions to the MHMP occur in a well-managed, efficient, and coordinated manner.

The following three process steps are addressed in detail below:

- Monitoring, evaluating, and updating the MHMP
- Implementation through existing planning mechanisms
- Continued public involvement

### 8.1 MONITORING, EVALUATING, AND UPDATING THE MHMP

The requirements for monitoring, evaluating, and updating the MHMP, as stipulated in the DMA 2000 and its implementing regulations, are described below.

#### DMA 2000 and FMA Requirements: Plan Maintenance Process - Monitoring, Evaluating, and Updating the Plan

##### Monitoring, Evaluating and Updating the Plan

**Requirement §201.6(c)(4)(i):** [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

##### Element

- Does the plan describe the method and schedule for monitoring the plan? (For example, does it identify the party responsible for monitoring and include a schedule for reports, site visits, phone calls, and meetings?)
- Does the plan describe the method and schedule for evaluating the plan? (For example, does it identify the party responsible for evaluating the plan and include the criteria used to evaluate the plan?)
- Does the plan describe the method and schedule for updating the plan within the five-year cycle?

Source: FEMA, March 2004.

The MHMP was prepared as a collaborative effort among Mendocino County OES, the Task Force, and URS. To maintain momentum and build upon previous hazard mitigation planning efforts and successes, Mendocino County OES will use the Task Force to monitor, evaluate, and update the MHMP. Each participating jurisdiction will be responsible for implementing the county- or city-specific Mitigation Action Plan. Bill Woodworth, the Task Force leader, will serve as the primary point of contact and will coordinate all local efforts to monitor, evaluate, and revise the MHMP.

Each member of the Task Force, or representative from each participating jurisdiction, will conduct an annual review to monitor the progress in implementing the MHMP, particularly the county- or city-specific Mitigation Action Plan. As shown in Appendix G, the Annual Review Worksheet will provide the basis for possible changes in the to the overall MHMP Mitigation Action Plan and each County- or city-specific Mitigation Action Plan by refocusing on new or more threatening hazards, adjusting to changes to or increases in resource allocations, and engaging additional support for the MHMP implementation. The Task Force leader will initiate the annual review 1 month prior to the date of adoption. The findings from these reviews will be presented at the annual Task Force meeting. Each review, as shown on the Annual Review Worksheet, will include an evaluation of the following:

- Participation of each jurisdiction and others in the MHMP implementation
- Notable changes in the countywide risk of natural or human-caused hazards
- Impacts of land development activities and related programs on hazard mitigation
- Progress made with the Countywide Mitigation Action Plan as well as each county- or city- Mitigation Action Plan (identify problems and suggest improvements as necessary)
- The adequacy of local and county resources for implementation of the MHMP

A system of reviewing the progress on achieving the mitigation goals and implementing the Mitigation Action Plan activities and projects will also be accomplished during the annual review process. During each annual review, each community currently administering a mitigation project will submit a Progress Report to the Planning Team. As shown in Appendix G, the report will include the current status of the mitigation project, including any changes made to the project, the identification of implementation problems and appropriate strategies to overcome them, and whether or not the project has helped achieved the appropriate goals identified in the plan.

In addition to the annual review, the Task Force will update the MHMP every 5 years. To ensure that this update occurs, in the fourth year following adoption of the MHMP, the Task Force will undertake the following activities:

- Thoroughly analyze and update the risk of natural and human-made hazards countywide.
- Provide a new annual review (as noted above), plus a review of the three previous annual reviews.
- Provide a detailed review and revision of the mitigation strategy.
- Prepare a new Mitigation Action Plan for Mendocino County and the four incorporated jurisdictions.
- Prepare a new draft MHMP and submit it to the each appropriate governing body for adoption.
- Submit an updated MHMP to the California OES and FEMA for approval.

## **8.2 IMPLEMENTATION THROUGH EXISTING PLANNING MECHANISMS**

The requirements for implementation through existing planning mechanisms, as stipulated in the DMA 2000 and its implementing regulations, are described below.

## DMA 2000 Requirements: Plan Maintenance Process - Incorporation into Existing Planning Mechanisms

## Incorporation into Existing Planning Mechanisms

Requirement §201.6(c)(4)(ii): [The plan shall include 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.

## Element

- Does the plan identify other local planning mechanisms available for incorporating the requirements of the mitigation plan?
- Does the plan include a process by which the local government will incorporate the requirements in other plans, when appropriate?

Source: FEMA, March 2004.

After the adoption of the MHMP, each Task Force member will ensure that the MHMP, in particular each Mitigation Action Plan, is incorporated into existing planning mechanisms. Each member of the Task Force will achieve this incorporation by undertaking the following activities.

- Conduct a review of the community-specific regulatory tools to assess the integration of the mitigation strategy. These regulatory tools are identified in each community-specific capability assessment presented in Appendices H through L.
- Work with pertinent community departments to increase awareness of the MHMP and provide assistance in integrating the mitigation strategy (including the Mitigation Action Plan) into relevant planning mechanisms. Implementation of these requirements may require updating or amending specific planning mechanisms.

### 8.3 CONTINUED PUBLIC INVOLVEMENT

The requirements for continued public involvement, as stipulated in the DMA 2000 and its implementing regulations, are described below.

## DMA 2000 Requirements: Plan Maintenance Process - Continued Public Involvement

## Continued Public Involvement

**Requirement §201.6(c)(4)(iii):** [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

## Element

- Does the plan explain how continued public participation will be obtained? (For example, will there be public notices, an ongoing mitigation plan committee, or annual review meetings with stakeholders?)

Source: FEMA, March 2004.

Mendocino County OES and each of the four cities within the county are dedicated to involving the public directly in the continual reshaping and updating of the MHMP. Electronic and hard copies of the MHMP will be provided to Mendocino County and each city. In addition, a downloadable copy of the MHMP and any proposed changes will be posted on Mendocino County OES' Web site. This site will also contain an e-mail address and phone number to which people can direct their comments or concerns.

The Task Force will also identify opportunities to raise community awareness about the MHMP and the hazards that affect the county. This effort could include attendance and provision of materials at county and city-sponsored events, Red Cross of Sonoma and Mendocino counties and the Mendocino County Fire Safe Council outreach programs, and public mailings. Any public comments received regarding the MHMP will be collected by the Task Force leader, included in the annual report, and considered during future MHMP updates.

California Division of Dam Safety. 2007. Dams within the Jurisdiction of the State of California. Accessed October 31, 2007. <http://damsafety.water.ca.gov/docs/Jurisdiction110-07.pdf>.

City of Seattle, Department of Planning and Development. 2006. Seattle Landslide Study. Accessed November 11, 2007. <http://www.seattle.gov/DPD/Landslide/Study/part2.asp>.

County of Mendocino. 2006. Emergency Operations Plan. Accessed November 11, 2007. <http://www.co.mendocino.ca.us/oes/pdf/EOP%20Single%20DOC.pdf>.

County of Mendocino. 1981. Mendocino County General Plan. Accessed October 12, 2007. <http://www.co.mendocino.ca.us/planning/GenPlan/GPContents.htm>.

County of Mendocino. 2007. Mendocino County Zoning Code. Accessed November 8, 2007. <http://www.co.mendocino.ca.us/planning/ZOIndex.htm>.

Executive Office of the President of the United States. 2007. National Tsunami Hazard Mitigation Program. Accessed October 14, 2007. <http://nthmp.tsunami.gov/>

Federal Emergency Management Agency. 1992. Flood Insurance Study for Mendocino County, California. Accessed October 7, 2007. <http://map1.msc.fema.gov/idms/IntraView.cgi?KEY=8189079&IFIT=1>.

Mendocino County Fire Safe Council. 2005. Mendocino County Community Wildfire Protection Plan.

National Response Center. 2007. Standard Report. Accessed November 7, 2007. <http://www.nrc.uscg.mil/foia.html>.

United States Census Bureau 2007. American Fact Finder Fact Sheet. Accessed December 8, 2007. <http://factfinder.census.gov>.

United States Geological Survey. 2006a. Web site for USGS Quaternary Fault and Fold Database for the United States. Accessed November 4, 2007. <http://earthquake.usgs.gov/regional/quakefaults/ca/mon.html>.

United States Geological Survey. 2006b. Web site for Earthquakes Hazards Program – Northern California. Accessed November 4, 2007. <http://quake.usgs.gov/research/parkfield/geology.html>.

**Appendix A**  
**Crosswalk**

**FEMA Region IX – CA OES Local Hazard Mitigation Plan (LHMP) Crosswalk (includes Flood Mitigation Assistance (FMA) Requirements)**

Jurisdiction: Mendocino County Multi-Hazard Mitigation Plan

Date of Plan: Draft Plan, December 2007

**Instructions for using the plan review crosswalk single/multi-jurisdiction local hazard mitigation plans (LHMPs) as well as FMA.**

Attached is a Plan Review Crosswalk based on the *Multi-Hazard Mitigation Planning Guidance Under the Disaster Mitigation Act of 2000*, dated March 2004. This Plan Review Crosswalk is consistent with the *Disaster Mitigation Act of 2000* (P.L. 106-390), enacted October 30, 2000 and *44 CFR Part 201 – Mitigation Planning, Interim Final Rule* (the Rule), published February 26, 2002.

**Explanation of the Rule “shall” and “should” language. Planning criteria with the word “shall” means that the information is required to be included in the mitigation plan in order to receive FEMA approval. Planning criteria that have the words “should” indicates information that supports comprehensive local and State planning, but is not required at this time.**

**SCORING SYSTEM**

**N – Needs Improvement:** The plan does not meet the minimum for the requirement. Reviewer’s comments must be provided.

**S – Satisfactory:** The plan meets the minimum for the requirement. Reviewer’s comments are encouraged, but not required.

Each requirement includes separate elements. All elements of a requirement must be rated “Satisfactory” in order for the requirement to be fulfilled and receive a summary score of “Satisfactory.” **All planning elements must be included; however, a “Needs Improvement” score in the gray shaded areas will not preclude the plan from being approved by FEMA.** When reviewing Single Jurisdiction Plans (SJP), reviewers may want to put an N/A in the boxes for multi-jurisdictional plan requirements. When reviewing multi-jurisdictional plans, reviewers may want to put an N/A in the prerequisite box for single jurisdiction plans.

States that have additional requirements can add them in the appropriate sections of the *Multi-Hazard Mitigation Planning Guidance* or create a new section and modify this Plan Review Crosswalk to record the score for those requirements. *As part of a jurisdiction’s participation in California’s local hazard mitigation planning program, California requests completion of a local capabilities assessment as indicated in Section 2.2 of this Crosswalk.*

Optional matrices for assisting in the review of sections on profiling hazards, assessing vulnerability, and identifying and analyzing mitigation actions are found at the end of the Plan Review Crosswalk.

Please Note: Prior to submission and as illustrated in the example below, jurisdiction(s) submitting the plan for review and approval are required to complete the 2<sup>nd</sup> column of the crosswalk titled “Location in the Plan”.

**This example box is provided to illustrate how the local jurisdiction needs to complete the second column and further provides an example of how the FEMA review will be completed.** **Assessing Vulnerability: Overview - Requirement §201.6(c)(2)(ii):** *[The risk assessment shall include 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.*

Element	Location in the Plan (section or annex and page #)	Reviewer’s Comments	SCORE	
			N	S
A. Does the plan include an <b>overall summary</b> description of the jurisdiction’s <b>vulnerability</b> to each hazard?	Section II, pp. 4-10	The plan describes the types of assets that are located within geographically defined hazard areas as well as those that would be affected by winter storms.		X
B. Does the plan address the <b>impact</b> of each hazard on the jurisdiction?	Section II, pp. 10-20	<b>The plan does not address the impact of two of the five hazards addressed in the plan.</b> <b>Required Revisions:</b> • <b>Include a description of the impact of floods and earthquakes on the assets.</b> <b>Recommended Revisions:</b> This information can be presented in terms of dollar value or percentages of damage.	X	
<b>SUMMARY SCORE</b>			X	

**FEMA Region IX – CA OES Local Hazard Mitigation Plan (LHMP) Crosswalk (includes Flood Mitigation Assistance (FMA) Requirements)**

Jurisdiction: Mendocino County Multi-Hazard Mitigation Plan

Date of Plan: Draft Plan, December 2007

**Single Jurisdiction, Local Hazard Mitigation Plan (LHMP) & Multi-Jurisdictional, LHMP Review and Approval Status**

<b>Single/Lead Jurisdiction:</b> Mendocino County	<b>Title of MJP Plan: OES DRAFT</b> Mendocino County Multi-Hazard Mitigation Plan, Meeting the local plan requirements of the DMA 2000 and FMA	<b>Date of Plan:</b> December 2007
<b>Local Point of Contact:</b> Bill Woodworth	<b>Address:</b> 501 Low Gap Road Ukiah, CA 95482	
<b>Title:</b> Emergency Services Coordinator		
<b>Agency:</b> Mendocino County Office of Emergency Services		
<b>Phone Number:</b> 707.463.5667	<b>E-Mail:</b> <a href="mailto:woodworb@co.mendocino.ca.us">woodworb@co.mendocino.ca.us</a> Consultant Contact Information: Anna Davis, URS Corporation <a href="mailto:Anna_davis@urscorp.com">Anna_davis@urscorp.com</a> 415.994.5157	

<b>State Reviewer:</b>	<b>Title:</b>	<b>Date:</b>

<b>Title:</b>	<b>Date:</b>

**FEMA Region IX – CA OES Local Hazard Mitigation Plan (LHMP) Crosswalk (includes Flood Mitigation Assistance (FMA) Requirements)**

Jurisdiction: Mendocino County Multi-Hazard Mitigation Plan

Date of Plan: Draft Plan, December 2007

Plan Approved	
Date Approved	

List single jurisdiction or, if MJP, list Participating Jurisdictions, including the "Lead Jurisdiction":	Y	N	N/A	CRS Class
	1. Mendocino County	X		
2. City of Fort Bragg	X			
3. City of Point Arena	X			
4. City of Ukiah	X			
5. City of Willits	X			

\* Notes: Y = Participating, N = Not Participating, N/A = Not Mapped

**FEMA Region IX – CA OES Local Hazard Mitigation Plan (LHMP) Crosswalk (includes Flood Mitigation Assistance (FMA) Requirements)**

Jurisdiction: Mendocino County Multi-Hazard Mitigation Plan

Date of Plan: Draft Plan, December 2007

**LOCAL MITIGATION PLAN REVIEW SUMMARY**

**The plan cannot be approved if the plan has not formally been adopted.**

Each requirement includes separate elements. All elements of the requirement must be rated "Satisfactory" in order for the requirement to be fulfilled and receive a score of "Satisfactory." Elements of each requirement are listed on the following pages of the Plan Review Crosswalk.

*All planning elements must be included, however a "Needs Improvement" score in the gray shaded areas will not preclude the plan from being approved by FEMA.* Reviewer's comments must be provided for requirements receiving a "Needs Improvement" score.

**SCORING SYSTEM** - Please check one of the following for each requirement.  
**N – Needs Improvement:** The plan does not meet the minimum for the requirement. Reviewer's comments must be provided.  
**S – Satisfactory:** The plan meets the minimum for the requirement. Reviewer's comments are encouraged, but not required.

1.0 Prerequisite(s) (Check Applicable Box)	LHMP		FMA	
	NOT MET	MET	NOT MET	MET
1.1 Adoption by the Local Governing Body: §201.6(c)(5) & §78.5(f) <b>OR</b>				
1.2 Multi-Jurisdictional Plan Adoption: §201.6(c)(5) & §78.5(f) <b>AND</b>				
1.3 Multi-Jurisdictional Planning Participation: 201.6(a)(3) & §78.5(a)				

2.0 Planning Process	N	S	N	S
2.1 Documentation of the Planning Process: §201.6(b) and §201.6(c)(1) & §78.5(a)				
2.2 Local Capabilities Assessment §201.4(c)(ii) and §201.6(c)(1) [This section is reviewed and scored by OES.]				

3.0 Risk Assessment	N	S	N	S
3.1 Identifying Hazards: §201.6(c)(2)(i) & §78.5(b)				
3.2 Profiling Hazards: §201.6(c)(2)(i) & §78.5(b)				
3.3 Assessing Vulnerability: Overview: §201.6(c)(2)(ii) & §78.5(b)				
3.4 Assessing Vulnerability: Identifying Structures: 201.6(c)(2)(ii)(A) & §78.5(b)				

3.5 Assessing Vulnerability: Estimating Potential Losses: §201.6(c)(2)(ii)(B)				
3.6 Assessing Vulnerability: Analyzing Development Trends: §201.6(c)(2)(ii)(C)				
3.7 Multi-Jurisdictional Risk Assessment: §201.6(c)(2)(iii) & FEMA 299				

4.0 Mitigation Strategy	N	S	N	S
4.1 Local Hazard Mitigation Goals: §201.6(c)(3)(i) & §78.5(c)				
4.2 Identification and Analysis of Mitigation Actions: §201.6(c)(3)(ii) & §78.5(d)				
4.3 Implementation of Mitigation Actions: §201.6(c)(3)(iii) & §78.5(d)(e)				
4.4 Multi-Jurisdictional Mitigation Actions: §201.6(c)(3)(iv) & FEMA 299				

5.0 Plan Maintenance Process	N	S	N	S
5.1 Monitoring, Evaluating, and Updating the Plan: 201.6(c)(4)(i) & §78.5(e)				
5.2 Incorporation into Existing Planning Mechanisms: §201.6(c)(4)(ii)				
5.3 Continued Public Involvement: §201.6(c)(4)(iii)				

**STATE OES REVIEW STATUS OF THE LHMP OR FMP:**

STATE OES REVIEW COMPLETED on DATE: \_\_\_\_\_

FORWARDED TO FEMA FOR REVIEW/APPROVAL DATE: \_\_\_\_\_

**FEMA REVIEW STATUS OF THE LHMP OR FMP:**

FEMA REVIEW COMPLETE, PLAN RETURNED DATE: \_\_\_\_\_

FEMA REVIEW COMPLETE, PLAN APPROVED DATE: \_\_\_\_\_

**13.1.1.1 1.0 PREREQUISITE(S)**

1.1 Adoption by the Local Governing Body						
<i><b>Requirement §201.6(c)(5):</b> [The local hazard mitigation plan <b>shall</b> 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).</i>						
<i><b>FMA Requirement §78.5(f):</b> Documentation of formal plan adoption by the legal entity submitting the plan (e.g., Governor, Mayor, County Executive, etc.).</i>						
Element	Location in the Plan (section or annex and page #) [This column to be completed by the submitting jurisdiction(s)]	Reviewer's Comments	LHMP		FMA	
			NOT MET	MET	NOT MET	MET
A. Has the local governing body adopted the plan?	Section 2 Page 2-1					
B. Is supporting documentation, such as a resolution, included?	Appendix B					
<b>SUMMARY SCORE</b>						

1.2 Multi-Jurisdictional Plan Adoption						
<i><b>Requirement §201.6(c)(5):</b> For multi-jurisdictional plans, each jurisdiction requesting approval of the plan <b>must</b> document that it has been formally adopted.</i>						
<i><b>FMA Requirement §78.5(f):</b> Documentation of formal plan adoption by the legal entity submitting the plan (e.g., Governor, Mayor, County Executive, etc.).</i>						
Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	LHMP		FMA	
			NOT MET	MET	NOT MET	MET
A. Does the plan indicate the specific jurisdictions represented in the plan?	Section 2 Page 2-1					
B. For each jurisdiction, has the local governing body adopted the plan?	Section 2 Page 2-1					
C. Is supporting documentation, such as a resolution,	Appendix B					

## Appendix A Crosswalk

included for each participating jurisdiction?						
SUMMARY SCORE						

<b>1.3 Multi-Jurisdictional Planning Participation</b> <i><b>Requirement §201.6(a)(3):</b> Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process ... Statewide plans will not be accepted as multi-jurisdictional plans.</i> <i><b>FMA Requirement §78.5(a):</b> Description of the planning process and public involvement. Public involvement <b>may</b> include workshops, public meetings &amp; hearings.</i>						
Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	LHMP		FMA	
			NOT MET	MET	NOT MET	MET
A. Does the plan describe <b>how</b> each jurisdiction participated in the plan's development?	Section 4.1 & 4.2 Page 4-2					
SUMMARY SCORE						

**2.0 PLANNING PROCESS: §201.6(b):** *An open public involvement process is essential to the development of an effective plan.*

<b>2.1 Documentation of the Planning Process</b> <i><b>Requirement §201.6(b):</b> In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process <b>shall</b> include:</i> <ol style="list-style-type: none"> <li>(1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;</li> <li>(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</li> <li>(3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.</li> </ol> <i><b>Requirement §201.6(c)(1):</b> [The plan <b>shall</b> document] 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.</i> <i><b>FMA Requirement §78.5(a):</b> Description of the planning process and public involvement. Public involvement <b>may</b> include workshops, public meetings &amp; hearings.</i>		
	Location in the Plan (section or annex and page #)	SCORE

## Appendix A Crosswalk

			LHMP		FMA	
			N	S	N	S
A. Does the plan provide a narrative description of the process followed to prepare the plan?	Section 4.2 Page 4-2					
B. Does the plan indicate who was involved in the planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, etc.?)	Section 4.1 & 4.2 Page 4-1 – 4-3					
C. Does the plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)	Section 4.2 & 4.3 Page 4-3 – 4-4					
D. Was there an opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?	Section 4.3 Page 4-4	<i>Note: A “Needs Improvement” score on this requirement will not preclude the FMA plan from passing.</i>				
E. Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?	Section 4.4 Page 4-5	<i>Note: A “Needs Improvement” score on this requirement will not preclude the FMA plan from passing.</i>				
SUMMARY						

### 2.2 Local Capabilities Assessment (State OES Requested Information)

**Requirement §201.4(c)(3)(ii):** – Of the Federal Register Interim Final Rule 44 CFR Parts 201 and 206 states, “[The State mitigation strategy *shall* include] a general description and analysis of the effectiveness of local mitigation policies, programs, and capabilities.

*The following elements should be covered as they provide information that assists the State to meet the required planning element in the State’s mitigation plan. More importantly, providing this information benefits the local community in their planning efforts. A “Needs Improvement” score will not preclude either plan from being recommended for approval by OES or approved by FEMA.*

Element	Location in the Plan (section or annex and page #)	Reviewer’s Comments	SCORE			
			LHMP		FMA	
			N	S	N	S

## Appendix A Crosswalk

<p>A. Does the plan provide a description of the human and technical resources available within this jurisdiction to engage in a mitigation planning process and to develop a local hazard mitigation plan?</p>	<p>Table H-7 Table I-7 Table J-7 Table K-7 Table L-7</p>					
<p>B. Does the plan list local mitigation financial resources and funding sources (such as taxes, fees, assessments or fines) which affect or promote mitigation within the reporting jurisdiction?</p>	<p>Table H-8 Table I-8 Table J-8 Table K-8 Table L-8</p>					
<p>C. Does the plan list local ordinances which affect or promote disaster mitigation, preparedness, response or recovery within the reporting jurisdiction?</p>	<p>Table H-6 Table I-6 Table J-6 Table K-6 Table K-6</p>					
<p>D. Does the plan describe the details of in-progress, ongoing or completed mitigation projects and programs within the reporting jurisdiction?</p>	<p>Section 4.4</p>					
<p>STATE OES SUMMARY SCORE</p>						

3.0 RISK ASSESSMENT: §201.6(c)(2): *The plan shall include 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.*

3.1 Identifying Hazards						
<i>Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type ... of all natural hazards that can affect the jurisdiction.</i>						
<i>FMA Requirement §78.5(b): Description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential.</i>						
Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	LHMP		FMA	
			N	S	N	S
A. Does the plan include a <b>description</b> of the types of <b>all natural hazards</b> that affect the jurisdiction? If the hazard identification omits (without explanation) any hazards commonly recognized as threats to the jurisdiction, this part of the plan cannot receive a Satisfactory score.  Consult with the State Hazard Mitigation Officer to identify applicable hazards that may occur in the planning area.	Section 5.2 Page 5-2					
SUMMARY SCORE						

3.2 Profiling Hazards						
<p><b>Requirement §201.6(c)(2)(i):</b> [The risk assessment <b>shall</b> include a] description of the ... location and extent of all natural hazards that can affect the jurisdiction. The plan <b>shall</b> include information on previous occurrences of hazard events and on the probability of future hazard events.</p> <p><b>FMA Requirement §78.5(b):</b> Description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential.</p>						
Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	SCORE			
			N	S	N	S
A. Does the risk assessment identify the <b>location</b> (i.e., geographic area affected) of each natural hazard addressed in the plan?	Section 5.3 Pages 5-4 – 5-22					
B. Does the risk assessment identify the <b>extent</b> (i.e., magnitude or severity) of each hazard addressed in the plan?	Section 5.3 Pages 5-4 – 5-22					
C. Does the plan provide information on <b>previous occurrences</b> of each hazard addressed in the plan?	Section 5.3 Pages 5-4 – 5-22					
D. Does the plan include the <b>probability of future events</b> (i.e., chance of occurrence) for each hazard addressed in the plan?	Section 5.3 Pages 5-4 – 5-22					
SUMMARY SCORE						

3.3 Assessing Vulnerability: Overview						
<i><b>Requirement §201.6(c)(2)(ii):</b> [The risk assessment shall include 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.</i>						
<i><b>FMA Requirement §78.5(b):</b> Description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential.</i>						
Element	Location in the Plan (section or annex and page #)	Reviewer’s Comments	LHMP		FMA	
			N	S	N	S
A. Does the plan include an <b>overall summary</b> description of the jurisdiction’s <b>vulnerability</b> to each hazard?	Section 6, Page 6-10 – 6-15  Appendix H, Page H-6 – H-9  Appendix I, Page I-6 – I-9  Appendix J, Page J-6 – J-9  Appendix K, Page K-6 – K-9  Appendix L, Page L-6 – L-9					
B. Does the plan address the <b>impact</b> of each hazard on the jurisdiction?	Appendix H Appendix I Appendix J Appendix K Appendix L					
<b>SUMMARY SCORE</b>						

3.4 Assessing Vulnerability: Identifying Structures						
<p><b>Requirement §201.6(c)(2)(ii)(A):</b> <i>The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area ... .</i></p> <p><b>FMA Requirement §78.5(b):</b> <i>Description of the existing flood hazard and identification of the flood risk, including estimates of the number and type of structures at risk, repetitive loss properties, and the extent of flood depth and damage potential.</i></p>						
Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	LHMP		FMA	
			N	S	N	S
A. Does the plan describe vulnerability in terms of the <b>types and numbers</b> of <b>existing</b> buildings (including repetitive loss structures), infrastructure, and critical facilities located in the identified hazard areas?	Section 6, Page 6-10 – 6-15 Appendix H, Page H-6 – H-9 Appendix I, Page I-6 – I-9 Appendix J, Page J-6 – J-9 Appendix K, Page K-6 – K-9 Appendix L, Page L-6 – L-9	<i>Note: A “Needs Improvement” score on this requirement will not preclude the LHMP plan from passing.</i>				
B. Does the plan describe vulnerability in terms of the <b>types and numbers</b> of <b>future</b> buildings, infrastructure, and critical facilities located in the identified hazard areas?		<i>Note: A “Needs Improvement” score on this requirement will not preclude either plan from passing.</i>				
SUMMARY SCORE						

3.5 Assessing Vulnerability: Estimating Potential Losses						
<p><b>Requirement §201.6(c)(2)(ii)(B):</b> [The plan <b>should</b> describe vulnerability in terms of 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 ... .</p> <p>[The information in the following planning elements must be included, however a “Needs Improvement” score will not preclude either plan from being approved by FEMA.]</p>						
Element	Location in the Plan (section or annex and page #)	Reviewer’s Comments	LHMP		FMA	
			N	S	N	S
A. Does the plan estimate <b>potential dollar losses</b> to vulnerable structures?	Section 6, Page 6-10 – 6-15 Appendix H, Page H-6 – H-9 Appendix I, Page I-6 – I-9 Appendix J, Page J-6 – J-9 Appendix K, Page K-6 – K-9 Appendix L, Page L-6 – L-9					
B. Does the plan describe the <b>methodology</b> used to prepare the estimate?	Section 6.2 Page 6-5					
<b>SUMMARY SCORE</b>						

3.6 Assessing Vulnerability: Analyzing Development Trends						
<p><b>Requirement §201.6(c)(2)(ii)(C):</b> [The plan <b>should</b> describe vulnerability in terms of] 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.</p> <p>[The information in the following planning element must be included, however a “Needs Improvement” score will not preclude either plan from being approved by FEMA.]</p>						
Element	Location in the Plan (section or annex and page #)	Reviewer’s Comments	LHMP		FMA	
			N	S	N	S
A. Does the plan describe land uses and development trends?	Section 3 Page 3-4					
SUMMARY SCORE						

3.7 Multi-Jurisdictional Risk Assessment - <b>Requirement §201.6(c)(2)(iii):</b> For multi-jurisdictional plans, the risk assessment <b>must</b> assess each jurisdiction’s risks where they vary from the risks facing the entire planning area						
<p><b>FMA FEMA 299 Guidance:</b> The Plan should be coordinated with, and ideally developed in cooperation with, all of the local jurisdictions within the geographical area.</p>						
Element	Location in the Plan (section or annex and page #)	Reviewer’s Comments	LHMP		FMA	
			N	S	N	S
A. Does the plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?	Section 5.3 Pages 5-4 – 5-22	<b>Note: A “Needs Improvement” score on this requirement will not preclude the FMA plan from passing.</b>				
SUMMARY SCORE						

**4.0 MITIGATION STRATEGY:** §201.6(c)(3): *The plan shall include 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.*

**4.1 Local Hazard Mitigation Goals**

**Requirement §201.6(c)(3)(i):** *[The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards*

**FMA Requirement §78.5(c):** *The applicant’s floodplain management goals for the area covered by the plan.*

Element	Location in the Plan (section or annex and page #)	Reviewer’s Comments	LHMP		FMA	
			N	S	N	S
A Does the plan include a description of mitigation <b>goals</b> to reduce or avoid long-term vulnerabilities to the identified hazards? ( <b>GOALS</b> are long-term; represent what the community wants to achieve, such as “eliminate flood damage”; and are based on the risk assessment findings.)	Table 7-1 Page 7-1 – 7-2					
<b>SUMMARY SCORE</b>						

4.2 Identification and Analysis of Mitigation Actions						
<p><b>Requirement §201.6(c)(3)(ii):</b> [The mitigation strategy <b>shall</b> include 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.</p> <p><b>FMA Requirement §78.5(d):</b> Identification and evaluation of cost-effective and technically feasible mitigation actions considered.</p>						
Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	LHMP		FMA	
			N	S	N	S
A. Does the plan identify and analyze a <b>comprehensive range</b> of specific mitigation actions and projects for each hazard?	Table 7-2 Page 7-3 – 7-5					
B. Do the identified actions and projects address reducing the effects of hazards on <b>new</b> buildings and infrastructure?	Table 7-2 Page 7-3 – 7-5	<i>Note: A “Needs Improvement” score on this requirement will not preclude the FMA plan from passing.</i>				
C. Do the identified actions and projects address reducing the effects of hazards on <b>existing</b> buildings and infrastructure?	Table 7-2 Page 7-3 – 7-5					
SUMMARY SCORE						

4.3 Implementation of Mitigation Actions						
<p><b>Requirement: §201.6(c)(3)(iii):</b> [The mitigation strategy section <b>shall</b> include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization <b>shall</b> 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.</p> <p><b>FMA Requirement: §78.5(d):</b> Identification and evaluation of cost-effective and technically feasible mitigation actions considered</p> <p><b>FMA Requirement: §78.5(e):</b> Presentation of the strategy for reducing flood risks and continued compliance with the NFIP, and procedures for ensuring implementation, reviewing progress, and recommending revisions to the plan.</p>						
Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	LHMP		FMA	
			N	S	N	S
A. Does the mitigation strategy include how the actions are <b>prioritized</b> ? (For example, is there a discussion of the process and criteria used?)	Section 7 Page 7-6 – 7-7	<i>Note: A “Needs Improvement” score on this requirement will not preclude the FMA plan from passing.</i>				
B. Does the mitigation strategy address how the actions will be <b>implemented and administered</b> ? (For example, does it identify the responsible department, existing and potential resources, and timeframe?)	Section 7 Page 7-7 – 7-8					
B1 Does the mitigation strategy address continued compliance with the NFIP?	Table 7-4 Page 7-10	<i>Note: A “Needs Improvement” score on this requirement will not preclude the LHMP plan from passing.</i>				
C. Does the prioritization process include an emphasis on the use of a <b>cost-benefit review</b> (see page 3-36 of <i>Multi-Hazard Mitigation Planning Guidance</i> ) to maximize benefits?	Table 7-4 Page 7-9 – 7-11	<i>Note: A “Needs Improvement” score on this requirement will not preclude the FMA plan from passing.</i>				
C1 Does the mitigation strategy emphasize cost-effective and technically feasible mitigation actions?	Table 7-4 Page 7-9 – 7-11	<i>Note: A “Needs Improvement” score on this requirement will not preclude the LHMP plan from passing.</i>				
SUMMARY SCORE						

4.4 Multi-Jurisdictional Mitigation Actions						
<p><b>Requirement §201.6(c)(3)(iv):</b> For multi-jurisdictional plans, there <b>must</b> be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.</p> <p><b>FMA FEMA 299 Guidance:</b> The Plan should be coordinated with, and ideally developed in cooperation with, all of the local jurisdictions, within the geographical area.</p>						
Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	LHMP		FMA	
			N	S	N	S
A Does the plan include at least one identifiable <b>action item</b> for each jurisdiction requesting FEMA approval of the plan?	<p>Section 7, page 7-3 – 7-5</p> <p>Appendix H, page H-21 – H-24</p> <p>Appendix I, page I-14 – I-16</p> <p>Appendix J, page J-12 – J-14</p> <p>Appendix K, page K-14 – K-16</p> <p>Appendix L, page L-13 – K-16</p>					
<b>SUMMARY SCORE</b>						

5.0		PLAN MAINTENANCE PROCESS				
<p>5.1 Monitoring, Evaluating, and Updating the Plan</p> <p><b>Requirement §201.6(c)(4)(i):</b> [The plan maintenance process <b>shall</b> include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.</p> <p><b>FMA Requirement §78.5(e):</b> Presentation of the strategy for reducing flood risks and continued compliance with the NFIP, and procedures for ensuring implementation, reviewing progress, and recommending revisions to the plan.</p>						
Element	Location in the Plan (section or annex and page #)	Reviewer's Comments	LHMP		FMA	
			N	S	N	S
A. Does the plan describe the method and schedule for <b>monitoring</b> the plan? (For example, does it identify the party responsible for monitoring and include a schedule for reports, site visits, phone calls, and meetings?)	Section 8 Page 8-1 – 8-3					
B. Does the plan describe the method and schedule for <b>evaluating</b> the plan? (For example, does it identify the party responsible for evaluating the plan and include the criteria used to evaluate the plan?)	Section 8 Page 8-1 – 8-3					
C. Does the plan describe the method and schedule for <b>updating</b> the plan within the five-year cycle?	Section 8 Page 8-1 – 8-3	<i>Note: A “Needs Improvement” score on this requirement will not preclude the FMA plan from passing.</i>				
SUMMARY SCORE						

5.2 Incorporation into Existing Planning Mechanisms						
<i>Requirement §201.6(c)(4)(ii): [The plan shall include 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.</i>						
	Location in the Plan (section or annex and page #)		LHMP		FMA	
			N	S	N	S
A. Does the plan identify other local planning mechanisms available for incorporating the requirements of the mitigation plan?	Section 8, page 8-2 – 8-3 Table H-6, page H-17 – H-18 Table I-6, page I-10 – I-11 Table J-6, page J-8 – J-9 Table K-6, page K-10 – K-11 Table L-6, page L-10 – L-11	<i>Note: A “Needs Improvement” score on this requirement will not preclude the FMA plan from passing.</i>				
B. Does the plan include a process by which the local government will incorporate the requirements in other plans, when appropriate?	Section 8 Page 8-3	<i>Note: A “Needs Improvement” score on this requirement will not preclude the FMA plan from passing.</i>				
SUMMARY SCORE						

5.3 Continued Public Involvement						
<i>Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.</i>						
	Location in the Plan (section or annex and page)		LHMP		FMA	
			N	S	N	S
A. Does the plan explain how <b>continued public participation</b> will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)	Section 8 Page 8-3 – 8-4	<i>Note: A “Needs Improvement” score on this requirement will not preclude the FMA plan from passing.</i>				
SUMMARY S						

## Matrix A: Profiling Hazards

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure that their plan addresses each natural hazard that can affect the jurisdiction. **Completing the matrix is not required.**

*Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each applicable hazard. An “N” for any element of any identified hazard will result in a “Needs Improvement” score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.*

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	A. Location		B. Extent		C. Previous Occurrences		D. Probability of Future Events	
	Yes	N	S	N	S	N	S	N	S
Avalanche	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coastal Erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coastal Storm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dam Failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drought	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Earthquake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expansive Soils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Extreme Heat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hailstorm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hurricane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land Subsidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landslide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Severe Winter Storm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tornado	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

To check boxes, double click on the box and change the default value to “checked.”

## Appendix A Crosswalk

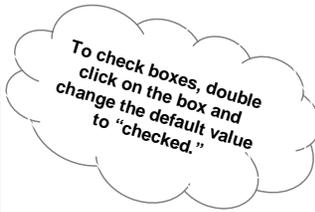
Tsunami	<input type="checkbox"/>								
Volcano	<input type="checkbox"/>								
Wildfire	<input type="checkbox"/>								
Windstorm	<input type="checkbox"/>								
Other _____	<input type="checkbox"/>								
Other _____	<input type="checkbox"/>								
Other _____	<input type="checkbox"/>								

## Matrix B: Assessing Vulnerability

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure that their plan addresses each requirement. **Completing the matrix is not required.**

*Note: First, check which hazards are identified in requirement §201.6(c)(2)(i). Then, place a checkmark in either the N or S box for each **applicable** hazard. An “N” for any element of any identified hazard will result in a “Needs Improvement” score for this requirement. List the hazard and its related shortcoming in the comments section of the Plan Review Crosswalk.*

*Note: Receiving an N in the shaded columns will not preclude the plan from passing.*



Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	A. Overall Summary Description of Vulnerability		B. Hazard Impact		A. Types and Number of Existing Structures in Hazard Area (Estimate)	B. Types and Number of Future Structures in Hazard Area (Estimate)	A. Loss Estimate		B. Methodology	
	Yes	N	S	N	S			N	S	N	S
Avalanche	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coastal Erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coastal Storm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dam Failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drought	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Earthquake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expansive Soils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Extreme Heat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hailstorm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hurricane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land Subsidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landslide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Severe Winter Storm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tornado	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tsunami	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

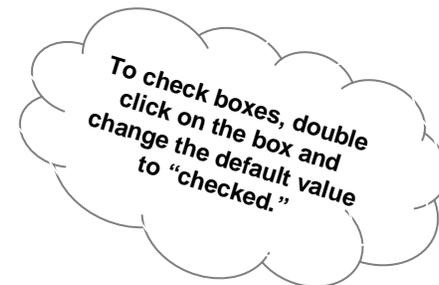
## Appendix A Crosswalk

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"/>		<input type="checkbox"/>												

## Matrix C: Identification and Analysis of Mitigation Actions

This matrix can assist FEMA and the State in scoring each hazard. Local jurisdictions may find the matrix useful to ensure consideration of a range of actions for each hazard. **Completing the matrix is not required.**

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	A. Comprehensive Range of Actions and Projects	
	Yes	N	S
Avalanche	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coastal Erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coastal Storm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dam Failure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drought	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Earthquake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expansive Soils	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Extreme Heat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hailstorm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hurricane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land Subsidence	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Landslide	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Severe Winter Storm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tornado	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tsunami	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Volcano	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildfire	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



# Appendix A Crosswalk

Hazard Type	Hazards Identified Per Requirement §201.6(c)(2)(i)	A. Comprehensive Range of Actions and Projects	
	Yes	N	S
Windstorm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Appendix B**  
**Adoption Resolution**

**Appendix B**  
**Adoption Resolutions**

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**Appendix C**  
**Figures**

**See End of Report for Appendix C**



**Appendix D**  
**Task Force Meeting Agendas & Minutes**

Mendocino County Multi-Hazard Mitigation Plan  
MHMP Task Force Meeting 1  
June 28, 2007

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**AGENDA**

**10:00-10:15 Introductions**

- URS Consulting Team
- Multi-Jurisdictional Hazard Mitigation Planning Team

**10:15-10:45 Pre-Disaster Mitigation Planning**

- Why Mitigation Planning?
- Disaster Management Act of 2000, 44 CFR Part 201\*
- Flood Mitigation Assistance Program, 44 CFR 78.5\*
- Types of Funding\*

**10:45-11:15 Plan Development**

- FEMA HMP-FMA Crosswalk\*
- Draft Plan Outline\*
- Draft Schedule\*

**11:15-11:45 Exercise & Homework**

- Hazard Identification\*
- Critical Facilities List\*

**11:45-12:00 Questions & Answers**

**\* Additional handout**

Mendocino County Multi-Hazard Mitigation Plan

MHMP Task Force Meeting 1

June 28, 2007

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**MEETING SUMMARY NOTES**

**Team Members:**

- 10 people attended the first Task Force meeting, including the Mendocino County Fire Safe Council and the Red Cross.
- Hazard Mitigation Plan (HMP) Team to be referred to as the HMP Task Force.
- Second meeting will be held first week of September.

**Hazards Identified:**

- Meeting attendees (Task Force) screened and identified the following hazards to be profiled in this version of the HMP:
  - Dam failures, drought, earthquakes, fires: wildland and structural fires, floods, hazmat events, landslides, tsunamis, and windstorms.
- Other hazards considered, but not likely to be included: coastal erosion, volcanic eruption, and asbestos.
- URS will follow-up with FEMA regarding the asbestos hazard issue. However, most likely this issue is considered a health-related hazard, not a natural or techno hazard.

**Asset Inventory:**

- First draft of the critical facilities list distributed.
- URS will revise list (after discussing with County GIS) and email out new draft version on Tuesday, July 10.

Each participating community, as well as special interest groups (i.e., Red Cross) will need to email back revised list/new list of facilities to be included by Tuesday, July 24.

Mendocino County Multi-Hazard Mitigation Plan  
MHMP Task Force Meeting 2  
September 13, 2007

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**AGENDA**

- 1:00-1:15      Plan Update**
- Recap of Meeting 1
  - Progress Made-to-Date
  - Wind as a hazard?
- 1:15-2:15      Risk Assessment**
- Figures
  - Assets
  - Exposure Analysis
- 2:15-2:30      Next Steps**
- Draft Risk Assessment
  - Develop Mitigation Strategies
- 2:30              Questions & Answers**

**Upcoming Dates:**

- |                   |   |
|-------------------|---|
| Monday, Sept. 24  | Submit final asset information to URS             |
| Monday, Oct. 8    | Review draft risk assessment                      |
| Thursday, Oct. 18 | Task Force meeting 3, develop mitigation strategy |
| Thursday, Nov. 1  | Review mitigation strategy                        |
| Thursday, Nov. 8  | Task Force Draft MHMP                             |
| Thursday, Nov. 29 | Public Comment Draft MHMP                         |
| Monday, Dec. 3 –  | Coastal and Inland Public Workshops               |
| Friday, Dec. 14   |   |
| January 2008      | Final Draft MHMP                                  |

Mendocino County Multi-Hazard Mitigation Plan  
MHMP Task Force Meeting 2  
September 13, 2008

---

**MEETING SUMMARY NOTES**

**Team Members:**

- 8 people attended the second Task Force meeting, including the Mendocino County Fire Safe Council, Red Cross, and CERT.

**Hazard Figures:**

- URS distributed poster-sized hazard figures for the Task Force to review. URS described the methodology and data (i.e.: CDF FRAP, CGS, etc.) used to create each figure.

**Vulnerability Analysis:**

- First draft of the vulnerability analysis reviewed.
- Communities to review initial analysis and email URS with updated asset list by the end of October. URS will revise vulnerability analysis based on updated lists. New vulnerability analysis to be distributed during the 3<sup>rd</sup> Task Force Meeting.

Mendocino County Multi-Hazard Mitigation Plan  
MHMP Task Force Meeting 3  
October 23, 2007

---

**AGENDA**

**1:00-1:15 Plan Update**

- Recap of Meeting 2
- Additional Progress Made-to-Date

**1:15-1:30 Risk Assessment**

- Revised Assets Lists
- Revised Exposure Analyses

**1:30-2:45 Mitigation Strategy**

- Overview of a Mitigation Strategy
- Goals
- Potential Mitigation Actions
- Evaluation Criteria for Mitigation Action Plan Selection
- Mitigation Action Plan Matrix

**2:45-3:00 Task Force Homework**

**Upcoming Dates:**

October 23	Task Force Meeting 3
November 1	Community-Specific Action Plan Matrix Due
November 15	Task Force Draft MHMP
November 29	Task Force Draft MHMP Comments Due
December 5	Public Comment Draft MHMP Available
December 5 – 14	Inland and Coastal Workshop
December 31	Close of the Draft Public MHMP
January 7	Final Draft MHMP sent to CA OES/FEMA for Review

## Mendocino County Multi-Hazard Mitigation Plan

### MHMP Task Force Meeting 3

October 23, 2007

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#### **MEETING SUMMARY NOTES**

##### **Team Members:**

- 6 people attended the third Task Force meeting, including the County's CERT members.

##### **Vulnerability Analysis:**

- The Task Force members reviewed the updated vulnerability analysis for the entire county as well as each participating community.
- The City of Ukiah asked for cell phone towers to be included in the analysis. URS to collect cell phone tower locations from Mendocino County and include these facilities in as "Utilities" in the asset lists.

##### **Mitigation Strategy:**

- The Task Force members reviewed and provided feedback on a list of draft goals and mitigation actions developed to date.
- The Task Force members prioritized the draft mitigation actions using the simplified STAPLEE evaluation criteria and Benefit-Cost Analysis Fact Sheet. In addition, the Task Force reviewed the lists of FY 2006 and FY 2007 PDM grant recipients during this process.
- The Task Force determined that seven mitigation actions should be included Countywide Mitigation Action Plan.

**Appendix E**  
**Public Outreach**



**MENDOCINO COUNTY EXECUTIVE OFFICE**

**NEWS RELEASE**

**CONTACT: BILL WOODWORTH at 463-5667**

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TO: MENDOCINO COUNTY NEWS MEDIA  
FR: MENDOCINO COUNTY OFFICE OF EMERGENCY SERVICES

**MENDOCINO COUNTY MULTI-HAZARD MITIGATION PLAN DEVELOPMENT**

Ukiah, California...*July 10, 2007*

This email is to announce the start of the process to develop a Multi-Hazard Mitigation Plan for the County of Mendocino and the cities of Fort Bragg, Point Arena, Willits and Ukiah. This plan is required under the Disaster Mitigation Act of 2000 (DMA 2000), which emphasizes the need for mitigation planning to reduce a community's vulnerability to natural and human-caused hazards. In addition, the DMA 2000 requires a community to have a FEMA-approved plan in order to be eligible for certain types of pre- and post-disaster funding.

Mendocino County Office of Emergency Services has created a mitigation planning Task Force, including county and city representatives and other relevant agencies, to provide input for the development of the plan. An initial Task Force meeting was held on June 28, where the basics of the plan requirements and planning process were discussed. In addition, the Task Force selected the following hazards to be included in this version of the plan: dam failure, drought, flood, earthquake, hazmat event, landslide, structural and wildland fire, tsunami, and windstorm.

Two public workshops will be held later this fall to solicit public input for developing different ways to mitigate the effects of a disaster before it occurs. Examples of mitigation activities include seismically retrofitting critical facilities, increasing culvert capacities and other drainage improvements, and establishing defensible space for fire.

The County anticipates submitting a draft plan to the Governor's Office of Emergency Services and FEMA for courtesy review by late November. In the meantime, should you have any questions or comments, please feel free contact me.

Bill Woodworth, Emergency Services Coordinator  
Mendocino County Office of Emergency Services

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501 Low Gap Rd, Rm 1010  
Ukiah CA 95482-3734

Office: 707-463-5667  
Fax: 707-463-5649



**MENDOCINO COUNTY EXECUTIVE OFFICE**

**NEWS RELEASE**

**CONTACT: Bill Woodworth, Emergency Services Coordinator 707/463-5667**

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TO: MENDOCINO COUNTY NEWS MEDIA  
FR: MENDOCINO COUNTY EXECUTIVE OFFICE

**The County of Mendocino is in the process of creating a Local  
Hazard Mitigation Plan**

Ukiah, California... *December 19, 2007*

Once approved and adopted, the County can apply for funding to correct existing conditions that result in additional damages inflicted by natural or manmade disasters. The County and the Cities of Ukiah, Willits, Fort Bragg and Point Arena will identify these conditions within their jurisdictions. The County of Mendocino is encouraging the residents of the County and the four Cities to read the DRAFT PLAN located on the County Web Site, [Mendocino@co.mendocino.ca.us](mailto:Mendocino@co.mendocino.ca.us) titled Draft Local Hazard Mitigation Plan and attend one of the two Public Comment Meetings to voice their comments on the plan. The first meeting will be held in Willits in the Community Room located at 111 East Commercial St on January 8, 2008 at 5:30 PM. The second meeting will be held in the town of Mendocino in Preston Hall at the Presbyterian Church located at 44831 Main St on January 10, 2008 at 5:30 PM.

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501 Low Gap Rd, Rm 1010  
Ukiah CA 95482-3734

ceo@co.mendocino.ca.us

Office: 707-463-4441  
Fax: 707-463-5649

This is **G o o g l e**'s [cache](#) of <http://www.co.mendocino.ca.us/oes/mitigation.htm> as retrieved on 7 Jan 2008 23:03:49 GMT.

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**Appendix F**  
**Benefit–Cost Analysis Fact Sheet**

***Benefit-Cost Analysis Fact Sheet***

Hazard mitigation projects are specifically aimed at reducing or eliminating future damages. Although hazard mitigation projects may sometimes be implemented in conjunction with the repair of damages from a declared disaster, the focus of hazard mitigation projects is on strengthening, elevating, relocating, or otherwise improving buildings, infrastructure, or other facilities to enhance their ability to withstand the damaging impacts of future disasters. In some cases, hazard mitigation projects may also include training or public-education programs if such programs can be demonstrated to reduce future expected damages.

A Benefit-Cost Analysis (BCA) provides an estimate of the “benefits” and “costs” of a proposed hazard mitigation project. The benefits considered are avoided future damages and losses that are expected to accrue as a result of the mitigation project. In other words, benefits are the reduction in expected future damages and losses (i.e., the difference in expected future damages before and after the mitigation project). The costs considered are those necessary to implement the specific mitigation project under evaluation. Costs are generally well determined for specific projects for which engineering design studies have been completed. Benefits, however, must be estimated probabilistically because they depend on the improved performance of the building or facility in future hazard events, the timing and severity of which must be estimated probabilistically.

***All Benefit-Costs must be:***

- Credible and well documented
- Prepared in accordance with accepted BCA practices
- Cost-effective ( $BCR \geq 1.0$ )

***General Data Requirements:***

- All data entries (other than Federal Emergency Management Agency [FEMA] standard or default values) MUST be documented in the application.
- Data MUST be from a credible source.
- Provide complete copies of reports and engineering analyses.
- Detailed cost estimate.
- Identify the hazard (flood, wind, seismic, etc.).
- Discuss how the proposed measure will mitigate against future damages.
- Document the Project Useful Life.
- Document the proposed Level of Protection.
- The Very Limited Data (VLD) BCA module cannot be used to support cost-effectiveness (screening purposes only).
- Alternative BCA software MUST be approved in writing by FEMA HQ and the Region prior to submittal of the application.

***Damage and Benefit Data***

- Well documented for each damage event.
- Include estimated frequency and method of determination per damage event.
- Data used in place of FEMA standard or default values **MUST** be documented and justified.
- The Level of Protection **MUST** be documented and readily apparent.
- When using the Limited Data (LD) BCA module, users cannot extrapolate data for higher frequency events for unknown lower frequency events.

***Building Data***

- Should include FEMA Elevation Certificates for elevation projects or projects using First Floor Elevations (FFE).
- Include data for building type (tax records or photos).
- Contents claims that exceed 30 percent of building replacement value (BRV) **MUST** be fully documented.
- Method for determining BRVs **MUST** be documented. BRVs based on tax records **MUST** include the multiplier from the County Tax Assessor.
- Identify the amount of damage that will result in demolition of the structure (FEMA standard is 50 percent of pre-damage structure value).
- Include the site location (i.e., miles inland) for the Hurricane module.

***Use Correct Occupancy Data***

- Design occupancy for Hurricane shelter portion of Tornado module.
- Average occupancy per hour for the Tornado shelter portion of the Tornado module.
- Average occupancy for Seismic modules.

***Questions to Be Answered***

- Has the level of risk been identified?
- Are all hazards identified?
- Is the BCA fully documented and accompanied by technical support data?
- Will residual risk occur after the mitigation project is implemented?

***Common Shortcomings***

- Incomplete documentation.
- Inconsistencies among data in the application, BCA module runs, and the technical support data.
- Lack of technical support data.
- Lack of a detailed cost estimate.
- Use of discount rate other than FEMA-required amount of 7 percent.

## Appendix F Benefit–Cost Analysis Fact Sheet

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- Overriding FEMA default values without providing documentation and justification.
- Lack of information on building type, size, number of stories, and value.
- Lack of documentation and credibility for FFEs.
- Use of incorrect Project Useful Life (not every mitigation measure = 100 years).

**Appendix G**  
**Plan Maintenance Documents**

<b>Annual Review Questionnaire</b>				
PLAN SECTION	QUESTIONS	YES	NO	COMMENTS
<b>PLANNING PROCESS</b>	Are there internal or external organizations and agencies that have been invaluable to the planning process or to mitigation action			
	Are there procedures (e.g., meeting announcements, plan updates) that can be done more efficiently?			
	Has the Task Force undertaken any public outreach activities regarding the MHMP or implementation of mitigation actions?			
<b>HAZARD PROFILES</b>	Has a natural and/or human-caused disaster occurred in this reporting period?			
	Are there natural and/or human-caused hazards that have not been addressed in this HMP and should be?			
	Are additional maps or new hazard studies available? If so, what have they revealed?			
<b>VULNERABILITY ANALYSIS</b>	Do any new critical facilities or infrastructure need to be added to the asset lists?			
	Have there been changes in development patterns that could influence the effects of hazards or create additional risks?			
<b>MITIGATION STRATEGY</b>	Are there different or additional resources (financial, technical, and human) that are now available for mitigation planning within the			
	Are the goals still applicable?			
	Should new mitigation actions be added to the a community's Mitigation Action Plan?			
	Do existing mitigation actions listed in a community's Mitigation Action Plan need to be reprioritized?			
	Are the mitigation actions listed in a community's Mitigation Action Plan appropriate for available resources?			



Plan Goal (s) Addressed:

*Page 2 of 3*

Goal: \_\_\_\_\_

Indicator of Success: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**Project Status**

**Project Cost Status**

Project on schedule

Cost unchanged

Project completed

Cost overrun\*

Project delayed\*

\*explain: \_\_\_\_\_  
\_\_\_\_\_

\*explain: \_\_\_\_\_  
\_\_\_\_\_

Cost underrun\*

Project canceled

\*explain: \_\_\_\_\_  
\_\_\_\_\_

Summary of progress on project for this report:

A. What was accomplished during this reporting period?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B. What obstacles, problems, or delays did you encounter, if any?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

C. How was each problem resolved?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Next Steps: What is/are the next step(s) to be accomplished over the next reporting period?

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Other Comments:

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**Appendix H**  
**Mendocino County**

**Table H-1A Mendocino County Estimated Population and Building Inventory**

Population		Residential Buildings		Nonresidential Buildings	
2000 Census	Estimated 2005 Census	Total Building Count	Total Value of Buildings (\$)¹	Total Building Count	Total Value of Buildings (\$)²
58,195	60,458	23,194	3,550,433,000	111	417,728,000

Source: FEMA HAZUS-MH, Version 2006 and U.S. Census 2000.

¹Average insured structural value of all residential buildings (including single-family dwellings, mobile homes, etc., is \$153,000 per structure).

²Averaged insured structural value of all nonresidential buildings (including industry, trade, professional and technical services, etc., is \$3,763,000).

**Table H-1B Mendocino County Repetitive Loss Properties**

Type	Town	Occupancy	No. of Losses	Flood Insurance	Value (\$)¹	Total Claims (\$)²
RL	Navarro	Single Family	3	Yes	166,739	153,811
RL	Ukiah (unincorporated)	Single Family	2	No	131,137	14,280

Source: FEMA SQANet.

¹Insured structural value as of 9/30/2007.

²Content and building claims.

**Table H-2 Mendocino County Critical Facilities and Infrastructure**

Facility Type	Name / Number	Address	Value¹
Government	Administrative Center	501 Low Gap Rd., Ukiah	1,180,000
	Adult Services, Family and Children's Services, Family Center, Job Alliance	221 S. Lenore Ave., Willits	1,180,000
	Animal Shelter	298 Plant Rd., Ukiah	1,180,000
	Animal Shelter	19701 Summers Ln., Fort Bragg	1,180,000
	Department of Transportation	340 Lake Mendocino Dr., Ukiah	1,180,000
	General Services Agency	841 Low Gap Rd., Ukiah	1,180,000
	Human Resources	579 Low Gap Rd., Ukiah	1,180,000
	Job Alliance Mendocino Works	310 E. Redwood Ave., Fort Bragg	1,180,000
	Job Alliance Mendocino Works	76405 Covelo Rd., Covelo	1,180,000
	Job Alliance Mendocino Works	175 Main St., Point Arena	1,180,000

**Table H-2 Mendocino County Critical Facilities and Infrastructure**

<b>Facility Type</b>	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
	Job Alliance Mendocino Works	631 S. Orchard Ave., Ukiah	1,180,000
	Planning	790 S. Franklin St., Fort Bragg	1,180,000
	Public Defender	199 S. School St., Ukiah	1,800,000
	Public Defender	700 S. Franklin St., Fort Bragg	1,800,000
	Public Defender	125 E. Commercial St., Willits	1,800,000
	Public Health	1120 S. Dora St., Ukiah	1,800,000
	Public Health	221 S. Lenore Ave., Willits	1,800,000
	Veteran's Services	419 W. Talmage Rd., Ukiah	1,800,000
	Veteran's Services	360 N. Harrison St., Fort Bragg	1,800,000
	Vet's Memorial Building	293 Seminary St., Ukiah	496,486
	Ag/Farm/Water	890 N. Bush St., Ukiah	895,430
	Juvenile Hall	585 Low Gap Rd., Ukiah	4,851,565
	Courthouse	N. State St., Ukiah	11,857,764
	Courthouse Annex	175 S. School St., Ukiah	1,914,942
	Vet's Memorial Building	189 N. Main St., Willits	640,261
	County Fair Grounds	Highway 128, Boonville	2,959,082
	Vet's Memorial Building	110 Feliz Creek Rd., Hopland	291,905
	County Jail Complex	951 Low Gap Rd., Ukiah	16,675,291
	Mental Health	880 N. Bush, Ukiah	570,493
	Sheriff Administration/Probation	589 Low Gap Rd., Ukiah	1,391,280
	Building and Grounds	581 Low Gap Rd., Ukiah	528,871
	Sheriff Commet	145/147 Wabash, Ukiah	882,240
	Child Support Building	631 S. Orchard, Ukiah	892,449
	Mental Health	860 N. Bush St., Ukiah	47,424
	Public Health Drop-Off	405 Observatory Ave., Ukiah	397,473
	Public Works Yard	751 Hearst St. – Willits Rd., Willits	298,830
	Public Works Yard	120 E. Bush St., Fort Bragg	992,361
	Public Works Yard	850 Harrison Ave., Hopland	37,708
	Public Works Yard	14301 Eureka Hill Rd., Point Arena	207,144

**Table H-2 Mendocino County Critical Facilities and Infrastructure**

<b>Facility Type</b>	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
	Public Works Yard	14000 Highway 120, Boonville	94,751
	Public Works Yard	23290 Airport Rd., Covelo	151,507
	Public Works Yard	1825 Branscomb Rd., Laytonville	87,975
	Drug and Alcohol Rural Clinic	138 Main St., Point Arena	11,911
	Air Quality	306 Gobbi, Ukiah	29,779
	Sheriff Evidence	215 W. Perkins, Ukiah	119,113
	Social Services	Cherry Court, Ukiah	29,779
	Social Services	306 Redwood Ave., Fort Bragg	147,445
	AOP	124 Pine St., Fort Bragg	41,653
	Social Services	255 Main St., Point Arena	15,995
	Social Services	76300 Grange, Covelo	8,043
	Grand Jury	110 W. Standley St., Ukiah	35,640
	Sheriff's Office	76090 Highway 162, Covelo	335,910
	Mental Health	250 S. Franklin St., Fort Bragg	31,844
	Alternate Defender	327 N. State St., Ukiah	74,955
Veteran's Services	419 Talmage Rd., Ukiah	8,000	
Emergency Response	Redwood Valley – Calpella Fire	8481 East Rd., Redwood Valley	708,000
	National Fire Fighters	31800 Bruhel Point Rd., Fort Bragg	708,000
	Laytonville Fire Station	44950 Willis Ave., Laytonville	708,000
	Covelo Fire Department	75900 Covelo Rd., Covelo	708,000
	Mendocino County Sheriff	24000 S. Highway 1, Point Arena	1,652,000
	Sheriff Department – Civil Division	589 Low Gap Rd., Ukiah	1,652,000
	Sheriff Department – Investigations	951 Low Gap Rd., Ukiah	1,652,000
	Mendocino County Sheriff	125 E. Commercial St., Willits	1,652,000
	Mendocino County Sheriff	700 S. Franklin St. #110, Fort Bragg	1,652,000
	Mendocino County Sheriff	76270 Grange St., Covelo	1,652,000
	Albion Little River Volunteer Fire Department	31004 Albion Ridge Rd., Albion	708,000

**Table H-2 Mendocino County Critical Facilities and Infrastructure**

<b>Facility Type</b>	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
	Anderson Valley Fire Department	14281 Highway 128, Boonville	708,000
	Hopland Volunteer Fire Department	11000 Highway 101, Hopland	708,000
	Mendocino Volunteer Fire Department	44700 Little Lake Rd., Mendocino	708,000
	Potter Valley Fire Department	10521 Main St., Potter Valley	708,00
	South Coast Fire Protection District	39215 Church St., Gualala	708,000
	Whale Gulch Volunteer Fire Department	76850 Usal Rd., Whitehorn	708,000
	Westport Volunteer Fire Department	37511 N. Highway 1, Westsport	708,000
Educational	Hopland Elementary School	13710 Mountain House Rd., Hopland	590,000
	Manchester Elementary School	19550 Highway 1, Manchester	590,000
	Anderson Valley Elementary School	12300 Anderson Valley Wy., Boonville	590,000
	Anderson Valley Charter Network School	12300 Anderson Valley Wy., Boonville	590,000
	Anderson Valley Jr./Sr. High School	18200 Mountain View Rd., Boonville	590,000
	Rancheria Continuation School	12300 Anderson Valley Wy., Boonville	590,000
	Unicorn School	18151 Rays Rd., Philo	590,000
	Ukiah Junior Academy School	180 Stipp Ln., Ukiah	590,000
	Developing Virtue School	2001 Talmage Rd., Talmage	590,000
	Greenwood Elementary School	5150 S. Highway 1, Elk	590,000
	Albion Elementary School	30400 Albion Ridge Rd., Albion	590,000
	Waldorf School of Mendocino	6280 Third St., Calpella	590,000
	Comptche Elementary School	31301 Comptche-Ukiah Rd., Comptche	590,000
	Deep Valley Christian School	8555 Uva Dr., Redwood Valley	590,000
Redwood Valley Elementary School	700 School Way Rd., Redwood Valley	590,000	
Eagle Peak Middle School	8601 West Rd., Redwood Valley	590,000	

**Table H-2 Mendocino County Critical Facilities and Infrastructure**

<b>Facility Type</b>	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
	Mendocino Community High School	45220 Covelo St., Mendocino	590,000
	Mendocino Middle School	44301 Little Lake Rd., Mendocino	590,000
	Mendocino Elementary School	44261 Little Lake Rd., Mendocino	590,000
	Mendocino Alternative Learning Center	44302 Little Lake Rd., Mendocino	590,000
	Mendocino Community Day School	44141 Little Lake Rd., Mendocino	590,000
	Mendocino High School	10700 Ford St., Mendocino	590,000
	Mendocino High School	10700 Ford St., Mendocino	590,000
	Mendocino Academy School	10700 Ford St., Mendocino	590,000
	Pottery Valley Elementary / Junior High School	10401 Main St., Potter Valley	590,000
	Potter Valley High School	10401 main St., Potter Valley	590,000
	Centerville High School	10401 main St., Potter Valley	590,000
	Green House School	41725 Road 409, Mendocino	590,000
	Willits Seventh Day Adventist School	22751 Bray Rd., Willits	590,000
	Vineyard Elementary School	16500 Hearst-Willits Rd., Willits	590,000
	Crazy Horse Elementary School	27220 String Creek Rd., Willits	590,000
	Branscomb Elementary School	14320 Branscomb Rd., Laytonville	590,000
	Laytonville Continuation High School	200 Branscomb Rd., Laytonville	590,000
	Laytonville Elementary School	150 Ramsey Rd., Laytonville	590,000
	Laytonville High School	250 Branscomb Rd., Laytonville	590,000
	Eel River Charter School	25995 East Ln., Covelo	590,000
	Covelo Christian School	76451 Henderson Ln., Covelo	590,000
	Round Valley Elementary School	Foothill & Airport Sts., Covelo	590,000
	Round Valley High School	Howard & High Sts., Covelo	590,000

**Table H-2 Mendocino County Critical Facilities and Infrastructure**

<b>Facility Type</b>	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
	Round Valley Continuation School	Howard & High Sts., Covelo	590,000
	Spy Rock Elementary School	3510 Spy Rock, Laytonville	590,000
	Leggett Valley High School	1 School St., Leggett	590,000
	Leggett Valley Elementary School	1 School St., Leggett	590,000
	Mendocino College	1000 Hensley Creek Rd., Ukiah	590,000
Community	Bower Regional Park	38040 Old Stage Rd., Gualala	237,238
	Indian Creek County Park	Highway 128, Philo	237,238
	Mill Creek County Park	Mill Creek Rd., Talmage	237,238
	Point Arena Branch Library	225 Main St., Point Arena	213,531
	Round Valley Branch Library	76405 Covelo Rd., Covelo	213,531
	Ukiah Branch Library	105 N. Main St., Ukiah	213,531
	Willits Branch Library	390 E. Commercial St., Willits	213,531
	Covelo Community Service District Office	76270 Grange St., Covelo	213,531
	Vet's Memorial Building	144470 Highway 128, Boonville	270,003
	Faulkner Park	20400 Mountain View Rd., Boonville	8,332
	Redwood Valley Lions Park	8620 East Rd., Redwood Valley	45,833
State and Federal Highways	353.43 miles	---	1,837,219,265
Railroads	143.51 miles	---	198,804,977
Bridges	336	---	481,309,248
Ground and Air Facilities	Mendocino Transit Authority	33501 S. Highway 1, Gualala	12,862,000
	Laytonville	44900 Highway 101, Laytonville	25,724,000
	Leggett	69501 Highway 101, Leggett	25,724,000
	Ocean Ridge	Gualala	6,431,000
	Lofty Redwoods	Anchor Bay	6,431,000
	Boonville Airport	Boonville	6,431,000
	Little River Airport	Little River	6,431,000
	Round Valley Airport	Covelo	6,431,000

**Table H-2 Mendocino County Critical Facilities and Infrastructure**

<b>Facility Type</b>	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
Utilities	Mendocino City Community Services District	10500 Kelly St., Mendocino	78,588,000
	Covelo Community Services District	Sewer Farm Rd., Covelo	78,588,000
	North Gualala Water Company	46600 Pacific Woods Rd., Gualala	1,180,000
	KTDE Channel 263 tower	Gualala	118,000
	KZYX Channel 214 tower	Philo	118,000
	KUKI Channel 1400 tower	Ukiah	118,000
	KAKX Channel 207 tower	Mendocino	118,000
	KPMO Channel 1300 tower	Mendocino	118,000
	KMFB Channel 224 tower	Mendocino	118,000
	KOZT Channel 237 tower	Fort Bragg	118,000
	(2) Verizon Wireless tower	---	236,000
	(12) Edge Wireless tower	---	1,416,000
	(13) US Cellular tower	---	1,534,000
	(1) Cingular Wireless tower	---	118,000
	(5) California Rural Service Area #1, Inc. tower	---	590,000
	(4) Pacific Bell tower	---	472,000
	(3) Multi-agency tower	---	354,000
	MCI Telecommunications Group tower	---	118,000
	Central Valley Cable tower	---	118,000
	Private facility tower	---	118,000
	Golden Rule Church tower	---	118,000
	Sequoia Communications tower	---	118,000
PG&E tower	---	118,000	
USCell tower	---	118,000	
Dams	Cornett	---	NA
	McNabb	---	NA
	Mendocino 3 Upper	---	NA
	Mendocino Middle	---	NA
	Perry Gulch	---	NA
	Coyote Valley	---	NA

**Table H-2 Mendocino County Critical Facilities and Infrastructure**

Facility Type	Name / Number	Address	Value <sup>1</sup>
	Round Mountain	---	NA
	Lolonis Vineyards	---	NA
	Bevans Creek	---	NA
	Ridgewood	---	NA
	McGuire	---	NA
	Cape Horn	---	NA
	Chinquapin	---	NA
	Scout Lake	---	NA
	Lake Ada Rose	---	NA
	Brooktrails 3 N	---	NA
	Jayne's Lake	---	NA
	Mast	---	NA
	Williams Valley	---	NA
	Bradford	---	NA
	Crawford Ranch	---	NA
	Schwindt	---	NA

**Sources:** FEMA HAZUS-MH, local jurisdictions.

<sup>1</sup>Estimated and/or insured structural value for critical facilities and estimated values for critical infrastructure.

NA = Not Available.

**Table H-3 Mendocino County Potential Hazard Exposure Analysis Overview – Population and Buildings**

Hazard Type	Hazard Area	Methodology	Population Number	Buildings			
				Residential		Nonresidential	
				Number	Value (\$)¹	Number	Value (\$)¹
Dam Failure	High	Inundation area	5,596	1,727	247,921,000	18	67,490,000
Earthquake	Very strong	20-40% (g)	8,743	3,587	518,680,000	8	48,681,000
	Severe	>40-60% (g)	40,077	15,619	2,480,546,000	87	316,246,000
	Violent	>60-80% (g)	9,177	3,819	518,587,000	14	46,902,000
Flood	Moderate	500-year floodplain	515	159	23,996,000	1	3,864,000
	High	100-year floodplain	4,266	1,430	226,988,000	14	48,916,000
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	15,904	5,875	889,211,000	62	198,295,000
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	296	101	17,719,000	0	0
Landslide	Low	0-14 degrees	45,228	17,470	2,682,062,000	92	339,918,000
	Moderate	>14-32 degrees	11,861	5,221	791,131,000	17	71,844,000
	High	>32-56 degrees	1,057	484	73,905,000	3	9,986,000
Tsunami	Moderate	10-foot maximum run-up area	6,354	3,258	538,386,000	24	88,567,000
Urban Conflagration	Low	Low developed density	5,718	1,773	282,693,000	13	46,969,000
	Moderate	Moderate developed density	2,432	702	112,991,000	21	53,870,000
	High	High developed density	90	24	3,239,000	0	0
Wildland Fire	Low	Low fuel rank	10,338	3,529	530,445,000	19	84,592,000
	Moderate	Moderate fuel rank	24,470	8,977	1,375,596,000	58	188,589,000
	High	High fuel rank	17,528	7,993	1,230,273,000	22	99,879,000
	Very high	Very high fuel rank	5,784	2,637	402,092,000	12	46,858,000

¹Estimated and/or insured structural value.

**Table H-4 Mendocino County Potential Hazard Exposure Analysis Overview – Critical Facilities**

Hazard Type	Hazard Area	Methodology	Government		Emergency Response		Educational		Care		Community	
			No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹
Dam Failure	High	Inundation area	14	8,617,434	1	708,000	5	2,950,000	0	0	1	213,531
Earthquake	Very strong	20-40% (g)	2	3,053,833	4	2,832,000	10	5,900,000	0	0	3	515,573
	Severe	>40-60% (g)	46	61,553,231	12	13,216,000	30	17,700,000	0	0	6	1,137,195
	Violent	>60-80% (g)	7	5,866,235	2	2,360,000	3	1,770,000	0	0	2	450,769
Flood	Moderate	500-year floodplain	2	1,820,261	0	0	0	0	0	0	0	0
	High	100-year floodplain	2	2,360,000	1	708,000	3	1,770,000	0	0	1	213,531
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	37	37,441,401	13	12,980,000	15	8,850,000	0	0	8	1,620,729
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	2	1,820,261	0	0	0	0	0	0	0	0
Landslide	Low	0-14 degrees	55	70,473,299	17	17,700,000	41	24,190,000	0	0	10	1,866,299
	Moderate	>14-32 degrees	0	0	1	708,000	1	590,000	0	0	0	0
	High	>32-56 degrees	0	0	0	0	1	590,000	0	0	1	237,238
Tsunami	Moderate	10-foot maximum run-up area	0	0	0	0	0	0	0	0	0	0
Urban Conflagration	Low	Low developed density	21	32,942,981	6	7,080,000	16	9,440,000	0	0	3	472,895
	Moderate	Moderate developed density	21	27,128,437	3	3,068,000	5	2,950,000	0	0	3	640,593
	High	High developed density	3	1,257,293	0	0	0	0	0	0	0	0
Wildland Fire	Low	Low fuel rank	10	6,168,150	3	2,124,000	17	10,030,000	0	0	3	697,065
	Moderate	Moderate fuel rank	42	46,242,714	11	12,508,000	20	11,800,000	0	0	6	931,996
	High	High fuel rank	2	17,855,291	3	2,124,000	6	3,540,000	0	0	0	0
	Very high	Very high fuel rank	1	207,144	1	1,652,000	0	0	0	0	2	474,476

¹Estimated and/or insured structural value.

**Table H-5 Mendocino County Potential Hazard Exposure Analysis Overview – Critical Infrastructure**

Hazard Type	Hazard Area	Methodology	Highways		Railroads		Bridges		G&A Facilities		Utilities		Dams	
			Miles	Value (\$)¹	Miles	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹
Dam Failure	High	Inundation area	28.6	148,774,058	59.1	81,899,172	68	97,407,824	0	0	0	0	2	NA
Earthquake	Very strong	20-40% (g)	104.1	541,190,328	22.3	30,878,426	85	121,759,780	1	6,431,000	12	1,416,000	5	NA
	Severe	>40-60% (g)	211.8	1,101,198,339	92.9	128,694,742	210	300,818,280	5	77,172,000	37	161,306,000	16	NA
	Violent	>60-80% (g)	35.5	184,745,983	28.3	39,231,809	33	47,271,444	2	12,862,000	12	2,478,000	1	NA
Flood	Moderate	500-year floodplain	1.0	4,938,342	2.3	3,172,346	2	2,864,936	0	0	1	78,588,000	0	NA
	High	100-year floodplain	31.1	161,769,696	56.2	77,798,673	71	101,705,228	0	0	0	0	4	NA
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	353.4	1,837,219,265	143.5	198,804,977	190	272,168,920	3	64,310,000	7	79,296,000	1	NA
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	0.6	3,118,953	0.8	1,038,978	5	7,162,340	0	0	0	0	0	NA
Landslide	Low	0-14 degrees	246.6	1,281,889,683	100.3	138,918,285	237	339,494,916	8	96,465,000	41	162,840,000	21	NA
	Moderate	>14-32 degrees	98.0	509,169,077	38.9	53,832,913	75	107,435,100	0	0	19	2,242,000	1	NA
	High	>32-56 degrees	8.9	46,160,504	4.4	6,067,632	21	30,081,828	0	0	1	118,000	0	NA
Tsunami	Moderate	10-foot maximum run-up area	6.1	31,605,390	2.1	2,881,432	15	21,487,020	0	0	0	0	0	NA
Urban Conflagration	Low	Low developed density	52.6	273,220,283	3.0	4,086,647	34	48,703,912	3	38,586,000	4	78,942,000	1	NA
	Moderate	Moderate developed density	4.1	21,104,915	1.7	2,299,605	6	8,594,808	1	6,431,000	1	118,000	0	NA
	High	High developed density	0.1	311,895	0.4	609,534	1	1,432,468	0	0	1	118,000	0	NA
Wildland Fire	Low	Low fuel rank	49.4	256,949,745	28.0	38,816,218	90	128,922,120	3	38,586,000	3	78,824,000	6	NA
	Moderate	Moderate fuel rank	122.6	637,202,098	41.5	57,545,528	90	128,922,120	3	19,293,000	20	80,830,000	11	NA
	High	High fuel rank	141.3	734,305,501	59.5	82,453,294	119	170,463,692	1	25,724,000	25	2,950,000	5	NA
	Very high	Very high fuel rank	40.0	207,878,217	14.4	19,962,231	34	48,703,912	1	12,862,000	13	2,596,000	0	NA

¹Estimated value.

### *Dam Failure*

The State of California regulates and inventories dams measuring greater than 25 feet in height and retaining greater than 15 acre-feet of water, or those dams that are more than 6 feet in height and retaining greater than 50 acre-feet of water. Inundation maps were developed for larger dams. Critical facilities, infrastructure, and other buildings within the inundation area are considered to be in a high hazard area in the event of dam failure.

Within Mendocino County there are 1,727 residential structures (worth \$247,921,000), 18 nonresidential buildings (worth \$67,490,000), and an estimated population of 5,596 within the inundation area. There are 23 critical facilities with an estimated value of \$12,488,965 within the inundation area including 14 government facilities, including the Courthouse Annex, Animal Shelter, Department of Transportation, Job Alliance-Mendocino Works, Workforce Investment Board, and Veteran's Services all in Ukiah (worth \$8,617,434), the Hopland Volunteer Fire Department (worth \$708,000), five educational facilities (worth \$2,950,000), the Ukiah Branch Library (worth \$213,531), 68 bridges (worth \$97,407,824), 59.1 miles of rail (worth \$81,899,172), and 28.6 miles of highway (worth \$148,774,058). The Cape Horn and Bradford dams (values unavailable) have a high risk of failure.

### *Earthquake*

PGA shake maps produced by the USGS show that 37 critical facilities (worth \$20,148,406) fall within a very strong shaking range (20 to 40 percent acceleration due to gravity), including 2 government facilities (worth \$3,053,833), 4 emergency facilities (worth \$2,832,000), 10 educational facilities (worth \$5,900,000), 3 community facilities (worth \$515,573), 1 ground and air facility (worth \$6,431,000), and 12 utilities (worth \$1,416,000). There are also 85 bridges (worth \$121,759,780), 22.3 miles of rail (worth \$30,878,426), and 104.1 miles of highway (worth \$541,190,328). Residential buildings in the very strong shaking range total 3,587 (worth \$518,680,000), 8 nonresidential buildings (worth \$48,681,000), and an estimated population of 8,743.

There are 152 critical facilities within a severe shaking range (40 to 60 percent acceleration due to gravity) with a total value of \$332,084,426. These facilities include 46 government facilities (worth \$61,553,231), 12 emergency response facilities (worth \$13,216,000), 30 educational facilities (worth \$17,700,000), 6 community facilities (worth \$1,137,195), 37 utilities (worth \$161,306,000), and 5 ground and air facilities (worth \$77,172,000). Critical infrastructure located in the severe shaking range includes 210 bridges (worth \$300,818,280), 92.9 miles of rail (worth \$128,694,742), 211.8 miles of highway (worth \$1,101,198,339), and 16 dams (values unavailable). The largest percentage of the population (approximately 66 percent [40,077 people]) is within the severe shaking range with 15,619 residences (worth \$2,480,546,000) and 87 nonresidential buildings (worth \$316,246,000).

There are 3,819 residences (worth \$518,587,000), 14 nonresidential buildings (worth \$46,902,000), and an estimated 9,177 people are located within a violent shaking range area (60 to 80 percent acceleration due to gravity). Critical facilities are also located in this shaking range including 7 government facilities—the Department of Transportation in Ukiah, the Public Works Yard in Willits and Point Arena, and the Vet's Memorial Building, Public Health, Public Defender, and Adult Services, Family and Children's Services, Family Center, Job Alliance -

Mendocino Works all in Willits—(worth \$5,866,235), 2 emergency response facilities including the Mendocino County Sheriff in Willits and the Whale Gulch Volunteer Fire Department (worth \$2,360,000), 3 educational facilities including the Waldorf School of Mendocino, Manchester Elementary, and the Willits Seventh-Day Adventist School (worth \$1,770,000), 2 community facilities including the Willits Branch Library, and Bower Regional Park (worth \$450,769), 12 utilities (worth \$2,478,000), 2 ground and air facilities (worth \$12,862,000), 33 bridges (worth \$47,271,444), 28.3 miles of rail (worth \$39,231,809), and 35.5 miles of highway (worth \$184,745,983). The Brooktrails 3N Dam (value unknown) is also located in the violent shaking range for earthquake.

### ***Flood***

According to the FIRM, last updated for Mendocino County in January 1992, 2 government facilities Adult Services, Family and Children's Services, Family Center, Job Alliance-Mendocino Works and Public Health both in Willits (worth \$2,360,000), Covelo Fire Department (worth \$708,000), 3 educational facilities (worth \$1.77 million), Willits Branch Library (worth \$213,531), 71 bridges (worth \$101,705,228), 56.1 miles of rail (worth \$77,798,673), 31.1 miles of highway (worth \$161,769,696), and 4 dams (values unknown) are within the 100-year floodplain. There are 1,430 residential buildings (worth \$226,988,000), 14 nonresidential building (worth \$48,916,000), and an estimated population of 4,266 people located within the 100-year floodplain. Facilities, utilities, infrastructure, and other buildings within the 100-year floodplain have a 1 percent probability of occurrence in any given year and are considered to be at high risk of flooding.

A moderate risk is assigned to facilities, utilities, and other buildings within the 500-year floodplain. Mendocino County has 1 mile of highway (worth \$4,938,342), 2.3 miles of rail (worth \$3,172,346), 2 bridges (worth \$2,864,936), Covelo CSD (worth \$78,588,000), and 2 government facilities including the Vet's Memorial Building in Willits and the Animal Shelter in Ukiah (worth \$2,360,000). In addition, there are 159 residential structures (worth \$23,996,000), 1 nonresidential building (worth \$3,864,000), and an estimated population of 515 people located in the moderate risk (500-year floodplain) area.

There are two RL properties located in the 100-year floodplain, both of which are single-family residences. One is located in Navarro, is covered by flood insurance, and is insured for a structural value of \$166,739. The property has recorded three losses as a result of flooding on the Navarro River, with a total of \$153,811 in claims (including contents). The other RL property is in Ukiah (unincorporated – not covered by flood insurance) and is valued at \$131,137. The property has recorded two losses as a result of flooding on the Russian River, with a total of \$14,280 in claims (including contents).

### ***Hazardous Materials Event***

Using the National Response Center and the EPA's Environmental Facts Multisystem Query to locate hazardous waste handling facilities and businesses that generate hazardous waste from their activities, we can determine that 5,875 residences (worth \$889,211,000), 62 nonresidential buildings (worth \$198,295,000), and an estimated 15,904 people are located within ¼ mile of transportation routes in Mendocino County, putting them at risk to exposure of a hazardous materials event. There are 84 critical facilities (worth \$202,877,401), 353.4 miles of highway

(worth \$1,837,219,265), 143.5 miles of rail (worth \$198,804,977), 190 bridges (worth \$272,168,920), and the Crawford Ranch Dam (value unknown) within this buffer zone as well.

The Vet's Memorial Building (worth \$640,261), the Animal Shelter in Ukiah (worth \$1.18 million), 0.6 mile of highway (worth \$3,118,953), 0.8 mile of rail (worth \$1,038,978), and 5 bridges (worth \$7,162,340) are located within ¼ mile of EHS sites. There are 101 residences valued at \$17,719,000 and an estimated 296 people within this buffer zone as well.

### *Landslide*

USGS elevation datasets were used to determine the risk of landslides in Mendocino County. The slope inclination data assigns landslide potentials at 0 to 14 degrees (0 to 25 percent) (low), 14 to 32 degrees (25 to 65 percent) (medium), and 32 to 72 degrees (65 percent and above) (high). In general, a greater risk of landslides can be found in the northern portion of the county along highways 101 and 1, along seaside bluffs on the western coast of the county and along instable slopes in the eastern portion of the county. This analysis reveals that nearly 75 percent of the population is situated in an area of low risk to this hazard with 17,470 residences (worth \$2,682,062,000), 92 nonresidential buildings (worth \$339,918,000), and an estimated population of 45,228 people. There are 193 critical facilities (worth \$373,534,598) within an area of low risk to this hazard including 55 government facilities (worth \$70,473,299), 17 emergency response facilities (worth \$17,700,000), 41 educational facilities (worth \$24,190,000), 10 community facilities (worth \$1,866,299), 41 utilities (worth \$162,840,000), and 8 ground and air facilities (worth \$96,465,000). There are also 237 bridges (worth \$339,494,916), 100.3 miles of rail (worth \$138,918,285), 246.6 miles of highway (worth \$1,281,889,683), and 21 dams (values unknown).

Vineyard Elementary School (worth \$590,000), Whale Gulch Volunteer Fire Department (worth \$708,000), 19 utilities (worth \$2,242,000), 75 bridges (worth \$107,435,100), 38.9 miles of rail (worth \$53,832,913), 98 miles of highway (worth \$509,169,077), and 1 dam (value unknown) are located in a moderate landslide risk area. Also in this area are 5,221 residences valued at \$791,131,000, 17 nonresidential buildings (worth \$71,844,000), and an estimated 11,861 people.

The Green House School (worth \$590,000), Mill Creek County Park (worth \$237,238), Edge Wireless cell phone tower (worth \$118,000), 21 bridges (worth \$30,081,828), 4.4 miles of rail (worth \$6,067,632), and 8.9 miles of highway (worth \$46,160,504) are located in a high landslide risk area. Also in this area are 484 residences valued at \$73,905,000, 3 nonresidential buildings (worth \$9,986,000), and an estimated 1,057 people.

### *Tsunami*

A 10-foot maximum run-up area was used to categorize moderate risk to facilities, infrastructure, and other buildings based on NOAA models for maximum run-up future scenarios. There are 3,258 residences (worth \$5,386,000), 24 nonresidential buildings (worth \$88,567,000), and an estimated 6,354 people located in this moderate risk area. Critical infrastructure in this run-up area includes 6.1 miles of highway (worth \$31,605,390), 2.1 miles of rail (worth \$2,881,432), and 15 bridges (worth \$21,487,020).

### *Urban Conflagration*

Intensity of development, determined by the percentage of impervious surfaces, determines the risk of urban conflagration. Impervious surfaces accounting for 20 to 49 percent of total cover is considered low developed density and facilities, infrastructure, and other buildings categorized as such are at low risk to this hazard. There are 54 critical facilities (worth \$167,463,876) including 21 government facilities (worth \$32,942,981), 6 emergency response facilities (worth \$7,080,000), 16 educational facilities (worth \$9.44 million), 3 community facilities (worth \$472,895), 4 utilities (worth \$78,942,000), 3 ground and air facilities (worth \$38,586,000), 34 bridges (worth \$48,703,912), 3 miles of rail (worth \$4,086,647), 52.6 miles of highway (worth \$273,220,283) and Coyote Valley Dam (value unknown) in an area of low risk to this hazard. There are 1,773 residences (worth \$282,693,000), 13 nonresidential buildings (worth \$46,969,000), and an estimated population of 5,718 people located in the low risk hazard area.

Moderate developed density includes areas with impervious surfaces accounting for 50 to 79 percent of total cover and facilities, infrastructure, and other buildings categorized as such are at moderate risk to this hazard. Critical facilities in moderate developed densities include 21 government facilities (worth \$27,128,437), 3 emergency response facilities (worth \$3,068,000), 5 educational facilities (worth \$2,950,000), 3 community facilities (worth \$640,593), KUKI 1400 (worth \$118,000), Lofty Redwoods (worth \$6,431,000), 6 bridges (worth \$8,594,808), 1.7 miles of rail (worth \$2,299,605.9), and 4.1 miles of highway (worth \$21,104,915) are at moderate risk to urban conflagration. There are 702 residences (worth \$112,991,000), 21 nonresidential facilities (worth \$53.87 million), and an estimated 2,432 people in the moderate risk area.

Areas with a high risk to urban conflagration include high density areas with large numbers of people who reside and/or work in areas with impervious surfaces that account for 80 to 100 percent of total cover. Non-critical facilities with a high risk to this hazard include 24 residences valued at \$3,239,000 and an estimated population of 90. Critical facilities and infrastructure at high risk to this hazard include U.S. Cellular (worth \$118,000), 3 governmental facilities including the Public Defender and Grand Jury in Ukiah, and Alcohol and Other Drugs Program (AODP) in Fort Bragg (worth \$1,257,293), 0.1 mile of highway (worth \$311,895), 0.4 mile of railroad (worth \$609,534), and 1 bridge (worth \$1,432,468).

### *Wildland Fire*

Wildland fire hazard areas were identified for this plan by determining the amount of fuel in a given area. The wildland fire model takes into account slope, aspect, and fuel to determine the ranking. This model indicates that in the low risk area for wildland fire there are 45 critical facilities including 10 government facilities (worth \$6,168,150), 3 emergency response facilities (worth \$2,124,000), 17 educational facilities (worth \$10.03 million), 3 community facilities (worth \$697,065), 3 ground and air facilities (worth \$38,586,000), 3 utilities (worth \$78,824,000), 49.4 miles of highway (worth \$256,949,745), 28 miles of rail (worth \$38,816,218), 90 bridges (worth \$128,922,120), and 6 dams (values unknown). There are also 3,529 residences (worth \$530,445,000) and 19 nonresidential buildings valued at \$84,592,000 in the low risk area for this hazard. The estimated population in this low risk area is 10,338.

Within the moderate-risk wildland fire area are 42 government facilities (worth \$46,242,714), 11 emergency response facilities (worth \$12,508,000), 20 educational facilities (worth

\$11,800,000), 6 community facilities (worth \$931,996), 3 ground and air facilities (worth \$19,293,000), 20 utilities (worth \$80,830,000), 90 bridges (worth \$128,922,120), 41.5 miles of rail (worth \$57,545,528), 122.6 miles of highway (worth \$637,202,098), and 11 dams (values unknown). Approximately 40 percent of the population (24,470) lives in an area of moderate wildland fire risk with 8,977 homes valued at \$1,375,596,000 and 58 nonresidential buildings worth \$188,589,000.

In an area with high risk to wildland fire there are approximately 17,528 people with 7,993 residences (worth \$1,230,273,000) and 22 nonresidential building valued at \$99,879,000. Critical facilities include 2 government facilities (worth \$17,855,291), 3 emergency response facilities (worth \$2,124,000), 6 educational facilities (worth \$3.54 million), 25 utilities (worth \$2.95 million), 1 ground and air facility (worth \$25,724,000), 119 bridges (worth \$170,463,692), 59.5 miles of rail (worth \$82,453,294), 141.3 miles of highway (worth \$734,305,501), and 5 dams (values unknown).

In an area with very high risk to wildland fire there are approximately 5,784 people with 2,637 residences (worth \$402,092,000) and 12 nonresidential building valued at \$46,858,000. Critical facilities include the Public Works Yard in Point Arena (worth \$207,144), the Mendocino County Sheriff building (worth \$1,652,000), 2 community facilities including Indian Creek County Park and Bower Regional Park (worth 474,476), 13 utilities (worth \$2,596,000), the Mendocino Transit Authority (worth \$12,862,000), 34 bridges (worth \$48,703,912), 14.4 miles of rail (worth \$19,962,231), and 40 miles of highway (worth \$207,878,217).

**Table H-6 Mendocino County Legal and Regulatory Resources Available for Hazard Mitigation**

Regulatory Tool	Name	Effect on Hazard Mitigation
Plans	Mendocino County General Plan Safety Element (1981)	Describes regulatory framework and agency coordination for fire, flood, landslide, dam, and reservoir hazards response and recovery. Describes various methods of reducing hazards including structural flood control and flood plain management.
	Mendocino County General Plan Seismic Safety Element (1981)	Describes earthquake hazards considerations. Identifies unique seismic hazard zones within the County. States future development goals and policies with respect to surface faulting, ground shaking, liquefaction, landslides, and tsunami.
	Mendocino County General Plan Coastal Element (adopted 1985, last revised 2005)	Describes regulatory framework applying to coastal areas and puts forth detailed land use policies for the County's coastal areas.
	Land Area Plans	The County has established smaller area plans to provide more specific policies unique to particular geographic areas. Area plans include the Mendocino Town Plan, the Gualala Town Plan, and the Brooktrails Specific Plan.
	Emergency Operations Plan (2006)	Identifies emergency planning, policies, procedures, and response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies.
Programs	National Flood Insurance Program (NFIP)	Makes affordable flood insurance available to homeowners, business owners, and renters in participating communities. In exchange, those communities must adopt and enforce minimum floodplain management regulations to reduce the risk of damage from future floods.
Policies (Municipal Codes)	Title 7 Emergency Organization and Functions	Provides for the preparation and carrying out of plans for the protection of persons and property within the County in the event of an emergency.
	Title 8.70 Hazardous Materials Releases	Provides procedure for coordination among various agencies in the event of hazardous materials releases.
	Title 9.05 Emergency Medical Response	Provides medical direction and management of emergency medical services in Mendocino County in conformance with California Health and Safety Code Section 1443, Health and Safety Code Division 2.5, Welfare and Institution Code Section 17000, Vehicle Code Section 2512, and Government Code Section 37191.
	Title 18 Building Regulations	Adopts and enforces the California Building Code.

**Table H-7 Mendocino County Administrative and Technical Resources for Hazard Mitigation**

<b>Staff/Personnel Resources</b>	<b>Department/Division Position</b>
Planner(s) or engineer(s) with knowledge of land development and land management practices	Planning and Building Services
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Planning and Building Services
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	Planning and Building Services/ Office of Emergency Services
Floodplain manager	Planning and Building Services
Personnel skilled in GIS and/or HAZUS-MH	Planning and Building Services
Director of Emergency Services	Office of Emergency Services
Finance (grant writers, purchasing)	Various County Departments (Auditor-Controller, Department of Economic Development, Treasure –Tax Collector)
Public Information Officers	Various County Departments

**Table H-8 Mendocino County Financial Resources for Hazard Mitigation**

<b>Financial Resources</b>	<b>Effect on Hazard Mitigation</b>
General funds	Yes, the general funds can provide funding for hazard mitigation projects.
Authority to levy taxes for specific purposes	Yes, taxes can provide additional funding for hazard mitigation projects.
Incur debt through general obligation bonds	Yes, debt can be raised to provide funding for hazard mitigation projects.
Incur debt through special tax and revenue bonds	Yes, debt can be raised to provide funding for hazard mitigation projects.
Incur debt through private activity bonds	Yes, debt can be raised to provide funding for hazard mitigation projects.
Hazard Mitigation Grant Program (HMGP)	FEMA funding which is available to local communities after a Presidentially-declared disaster. It can be used to fund both pre- and post-disaster mitigation plans and projects.
Pre-Disaster Mitigation (PDM) grant program	FEMA funding which available on an annual basis. This grant can only be used to fund pre-disaster mitigation plans and projects only.
Flood Mitigation Assistance (FMA) grant program	FEMA funding which is available on an annual basis. This grant can be used to mitigate repetitively flooded structures and infrastructure to protect repetitive flood structures.
United State Fire Administration (USFA) Grants	The purpose of these grants is to assist state, regional, national or local organizations to address fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors and firefighters.
Fire Mitigation Fees	Finance future fire protection facilities and fire capital expenditures required because of new development within Special Districts.

**Table H-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
1.B	Integrate elements from the MHMP into other local planning documents, including the safety element section of general plans, hazard-specific zoning ordinances, and emergency operation plans.	High Priority	CEO	General funds	1-3 years	The integration of the MHMP elements into planning documents will help ensure consistency across all types and all phases of planning.
2.A	Develop a sustained public outreach program that encourages consistent hazard mitigation content. For example, consider publishing tsunami inundation maps in telephone books, wildland fire defensible space tips with summer water bills or along highway billboards, and the safe handling and disposal of hazardous waste and chemicals with garbage bills.	High Priority	OES	HMGP or PDM funding	Ongoing	A sustained mitigation outreach program will help build and support countywide capacity to enable the public to prepare for, respond to, and recover from disasters.
4.A	Strengthen, abate, or downgrade in occupancy, any structures that are owned or leased by Mendocino County or incorporated communities that do not meet the California Building Code (CBC) requirements for	High Priority	GSA	HMGP or PDM funding	5 years	As shown in the exposure analysis, a major earthquake poses the greatest risk of any hazard to Mendocino County critical facilities. Mitigating structures that do not meet code would reduce the risk of exposure and help Mendocino County respond

**Table H-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
	seismic safety or the California Codes Essential Services Building Act.					to and recover from this hazard.
5.A	Explore mitigation opportunities, including acquisition, relocation, and elevation, for the three repetitively flooded properties throughout the county (2 RL properties in Mendocino County).	High Priority	DOT	FMA funding	2-3 years	The mitigation of repetitively flooded properties is a priority for FEMA grant programs. Technical feasibility to mitigate a RL property will be determined by a County engineer. In addition, a County engineer or the NFIP coordinator will determine the mitigation RL project's BCA using FEMA-approved BCA software and methodologies.
5.B	Continue to participate in the NFIP program by enforcing the floodplain management ordinance to reduce future flood damage. In addition, join the Community Rating System (CRS) program. A community that participates in additional floodplain management activities, such as those outlined in the CRS program, will reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance.	High Priority	DOT	General funds	Ongoing, 1-2 years for CRS program.	The County already participates in the NFIP and is very knowledgeable about implementing additional floodplain management activities.

**Table H-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
5.D	Construct a lightweight fill prism under roads to prevent the slip plain from further movement and subsequent damage to roads.	High Priority	DOT	HMGP or PDM funding	3 years	Slipouts and other winter-storm related events close roads and cause significant damage to roads every 3-4 years, during a large winter storm events. Mitigating county roads will reduce the short-term interval of damage to these roads from these events.
5.F	Carry out minor flood and stormwater management projects that would reduce damage to infrastructure and residential buildings due to flooding. These projects include the modifying or replacing existing culverts and bridges, upgrading capacity of storm drains, stabilizing streambanks, clearing streambanks of debris and vegetation, and creating of debris or flood/stormwater retention basins in small watersheds.	High Priority	DOT	HMGP, FMA or PDM funding	3 years	As noted above, flooding cause significant damage to County infrastructure every 3-4 years, during a large winter storm events. Mitigating infrastructure from flooding will reduce the short-term interval of damage to these facilities from these events. In addition, these projects are not atypical in urbanized areas prone to flooding and are generally technically feasible.

**Table H-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
6.A	Examine and mitigate critical infrastructure that has been identified as currently being too narrow or having too many tight turns to ensure the safe transportation of truck loads within Mendocino County.	High Priority	DOT	HMGP or PDM funding	5 years	This effort will ensure that heavily used critical infrastructure will ensure the safe transportation of truck loads.
8.A	Participate in the Tsunami Ready Program. This new program, sponsored by the National Weather Service, is designed to provide communities with incentives to reduce their tsunami risks.	High Priority	OES	General funds	0-1 years	This program is already implemented in various coastal communities along the West Coast. Participating in a national mitigation/preparedness effort will allow the county to piggyback on these existing efforts.
10.B	Create a vegetation management program that provides vegetation management services to elderly, disabled, or low-income persons who lack the resources to remove flammable vegetation around their homes.	High Priority	OES	HMGP or PDM funding	Ongoing	This program will help mitigate wildland fire hazards around vulnerable populations. Protecting vulnerable populations from a disaster is FEMA and CDC goal.

**Table H-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
10.D	Develop a countywide chipper program in which local residents and business owners do their own vegetation management and the community offers free or reduced-cost roadside chipping.	High Priority	DOT	HMGP or PDM funding	Ongoing	The probability of future damage around residential structures in the WUI from wildland fires could be high if this mitigation action is not implemented.

**Appendix I**  
**City of Fort Bragg**

**Table I-1 City of Fort Bragg Estimated Population and Building Inventory**

Population		Residential Buildings		Nonresidential Buildings	
2000 Census	Estimated 2005 Census	Total Building Count	Total Value of Buildings (\$)¹	Total Building Count	Total Value of Buildings (\$)²
7,026	6,814	2,243	432,821,000	32	84,282,000

Sources: FEMA HAZUS-MH, Version 2006 and U.S. Census 2000.

¹Average insured structural value of all residential buildings (including single-family dwellings, mobile homes, etc.) is \$193,000 per structure.

²Averaged insured structural value of all nonresidential buildings (including industry, trade, professional and technical services, etc.) is \$2,634,000.

**Table I-2 City of Fort Bragg Critical Facilities and Infrastructure**

	Name / Number	Address	Value¹
Government	City Hall	416 N. Franklin St.	5,377,000
	Employment and Family Assistance Services	825 S. Franklin St.	1,180,000
	Fort Bragg Town Hall	363 N. Main St.	709,000
	Corporation Yard	31301 Cedar St.	1,029,000
Emergency Response	Fort Bragg Fire Department	141 N. Main St.	1,887,000
	Fort Bragg Police Department	250 Cypress St.	2,005,000
	Fort Bragg Fire Department – Highway 20 Station	32270 Highway 20	867,000
Educational	Dana Gray Elementary School	1197 E. Chestnut St.	590,000
	Redwood Elementary School	324 S. Lincoln St.	590,000
	Fort Bragg Community Day School	312 S. Lincoln St.	590,000
	Noyo High School	250 S. Sanderson Wy.	590,000
	Mendocino Coast Christian School	18500 Old coast Highway	590,000
	Fort Bragg High School	300 Dana St.	590,000
	Fort Bragg Middle School	500 Harold St.	590,000
	3 Rivers Learning Center School	22850 N. Highway 1	590,000
	College of the Redwoods	1211 Del Mar Dr.	590,000
	Lighthouse School	250 S. Sanderson Wy.	590,000
	Shelter Cove School	310 S. Lincoln St.	590,000
John Diederich Center	Dana St.	590,000	

**Table I-2 City of Fort Bragg Critical Facilities and Infrastructure**

	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
Care	Mendocino Coast District Hospital	700 River Drive	1,421,690
	Mendocino Coast Clinics	205 South St.	100,836
Community	Mendocino Botanical Gardens	18220 North Highway 1	100,836
	Wiggly Giggly Playground and Harold O. Bainbridge Park	Laurel St. b/w N. Harrison and N. Wipple Sts.	237,238
	Otis R. Johnson Wilderness Park	East end of Laurel St.	237,238
	Pomo Bluffs Park	Todd's Point, End of Cliff's Way	237,238
	Fort Bragg Branch Library	499 E. Laurel St.	213,531
	Glass Beach / MacKerricher State Park	West end of Elm St.	237,238
	Guest House Museum	343 N. Main St.	1,141,000
	Fort Building Museum	400 N. Franklin St.	156,000
	Redwood Coast Senior Center	490 N. Harold St.	237,238
	State and Federal Highways	3.58 miles	---
Railroads	3.35 miles	---	4,640,768
Bridges	2	---	2,864,936
Ground and Air Facilities	Mendocino Transit Authority	190 E. Spruce St.	106,695
Utilities	KDAC Channel 1230	Oak St.	118,000
	KSAY Channel 253	Celeri Ln.	118,000
	KFWU Channel 8	303 N. Main St.	118,000
	Wastewater Treatment Plant	Vicinity of Soldier Point	6,038,000
	KOZT	110 S. Franklin St.	118,000
	KSAY Channel 98.5 FM	22001 Bald Hill Rd.	118,000
	KJCU Channel 89.9	474 S. Franklin St.	118,000
	KMFB FM 92.7 & KPMO AM 1300	101 Boatyard Dr.	118,000
	Mendocino Coast Television	248 E. Laurel St.	24,761
	Noyo River Intake Pump Station	Madsen Ln.	331,000
	Highway 20 Water Tank	32270 Highway 20	305,000
	East Fort Bragg Pressure Zone Booster Station	Willow St.	182,000

**Table I-2      City of Fort Bragg Critical Facilities and Infrastructure**

	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
	South Fort Bragg Booster Station	S. Main St.	60,000
	Elm St. Lift Station	W. Elm St.	359,000
	Pudding Creek Lift Station	N. Main St.	397,000
	South Noyo Harbor Lift Station	S. Harbor Dr.	229,000
	North Harbor Lift Station	N. Harbor Dr.	229,000
	Native American Lift Station	N. Noyo Point Dr.	91,000
	Noyo Heights Lift Station	Noyo Heights	100,000
	Water Treatment Plant	31301 Cedar St.	6,305,000

**Sources:** FEMA HAZUS-MH, local jurisdictions.

<sup>1</sup>Estimated and/or insured structural value for critical facilities and estimated values for critical infrastructure.

NA = Not Applicable.

**Table I-3 City of Fort Bragg Potential Hazard Exposure Analysis Overview – Population and Buildings**

Hazard Type	Hazard Area	Methodology	Population		Buildings		
			Number	Residential		Nonresidential	
				Number	Value (\$) <sup>1</sup>	Number	Value (\$) <sup>1</sup>
Dam Failure	High	Inundation area	0	0	0	0	0
Earthquake	Very strong	20-40% (g)	0	0	0	0	0
	Severe	>40-60% (g)	7,026	2,243	432,821,000	32	84,282,000
	Violent	>60-80% (g)	0	0	0	0	0
Flood	Moderate	500-year floodplain	0	0	0	0	0
	High	100-year floodplain	70	19	3,865,000	1	849,000
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	3,170	995	203,952,000	28	74,149,000
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	44	13	3,505,000	1	1,589,000
Landslide	Low	0-14 degrees	6,890	2,185	423,053,000	31	82,001,000
	Moderate	>14-32 degrees	147	47	9,018,000	1	646,000
	High	>32-56 degrees	0	0	0	0	0
Tsunami	Moderate	10-foot maximum run-up area	7,026	2,243	432,821,000	32	84,282,000
Urban Conflagration	Low	Low developed density	1,601	520	96,598,000	4	8,746,000
	Moderate	Moderate developed density	4,237	1,348	259,151,000	17	55,012,000
	High	High developed density	121	37	9,579,000	6	12,367,000
Wildland Fire	Low	Low fuel rank	32	8	1,978,000	1	913,000
	Moderate	Moderate fuel rank	6,644	2,116	407,953,000	29	81,120,000
	High	High fuel rank	256	82	15,765,000	2	1,858,000
	Very high	Very high fuel rank	88	37	6,689,000	0	0

<sup>1</sup>Estimated and/or insured structural value.

**Table I-4 City of Fort Bragg Potential Hazard Exposure Analysis Overview – Critical Facilities**

Hazard Type	Hazard Area	Methodology	Government		Emergency Response		Educational		Care		Community	
			No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹
Dam Failure	High	Inundation area	0	0	0	0	0	0	0	0	0	0
Earthquake	Very strong	20-40% (g)	0	0	0	0	0	0	0	0	0	0
	Severe	>40-60% (g)	4	8,295,000	3	4,759,000	12	7,080,000	2	1,522,526	9	2,797,557
	Violent	>60-80% (g)	0	0	0	0	0	0	0	0	0	0
Flood	Moderate	500-year floodplain	0	0	0	0	0	0	0	0	0	0
	High	100-year floodplain	0	0	0	0	0	0	0	0	1	237,238
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	3	7,266,000	3	4,759,000	4	2,360,000	1	100,836	7	2,323,081
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	1	1,029,000	0	0	0	0	0	0	0	0
Landslide	Low	0-14 degrees	4	8,295,000	3	4,759,000	12	7,080,000	2	1,522,526	9	2,797,557
	Moderate	>14-32 degrees	0	0	0	0	0	0	0	0	0	0
	High	>32-56 degrees	0	0	0	0	0	0	0	0	0	0
Tsunami	Moderate	10-foot maximum run-up area	0	0	0	0	0	0	0	0	0	0
Urban Conflagration	Low	Low developed density	1	709,000	2	2,872,000	3	1,770,000	1	1,421,690	3	1,615,476
	Moderate	Moderate developed density	1	1,180,000	1	1,887,000	2	1,180,000	1	100,836	3	606,769
	High	High developed density	1	5,377,000	0	0	1	590,000	0	0	0	0
Wildland Fire	Low	Low fuel rank	0	0	0	0	0	0	0	0	0	0
	Moderate	Moderate fuel rank	4	8,295,000	2	3,892,000	11	6,490,000	2	1,522,526	7	2,323,081
	High	High fuel rank	0	0	1	867,000	1	590,000	0	0	1	237,238
	Very high	Very high fuel rank	0	0	0	0	0	0	0	0	1	237,238

¹Estimated and/or insured structural value.

Table I-5 City of Fort Bragg Potential Hazard Exposure Analysis Overview – Critical Infrastructure

Hazard Type	Hazard Area	Methodology	Highways		Railroads		Bridges		G&A Facilities		Utilities		Dams	
			Miles	Value (\$)¹	Miles	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹
Dam Failure	High	Inundation area	0.0	0	0.0	0	0	0	0	0	0	0	0	NA
Earthquake	Very strong	20-40% (g)	0.0	0	0.0	0	0	0	0	0	3	567,000	0	NA
	Severe	>40-60% (g)	3.4	17,778,032	3.4	4,640,768	2	2,864,936	1	106,695	17	14,909,761	0	NA
	Violent	>60-80% (g)	0.0	0	0.0	0	0	0	0	0	0	0	0	NA
Flood	Moderate	500-year floodplain	0.0	0	0.0	0	0	0	0	0	0	0	0	NA
	High	100-year floodplain	0.1	727,756	0.6	817,329	2	2,864,936	0	0	1	229,000	0	NA
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	3.6	18,609,753	3.4	4,640,768	2	2,864,936	0	0	12	2,250,761	0	NA
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	0.0	0	0.0	0	0	0	0	0	4	12,521,000	0	NA
Landslide	Low	0-14 degrees	3.5	18,089,927	3.2	4,419,120	1	1,432,468	1	106,695	20	15,476,761	0	NA
	Moderate	>14-32 degrees	0.1	519,826	0.2	221,649	1	1,432,468	0	0	0	0	0	NA
	High	>32-56 degrees	0.0	0	0.0	0	0	0	0	0	0	0	0	NA
Tsunami	Moderate	10-foot maximum run-up area	0.3	1,611,459	0.6	831,182	2	2,864,936	0	0	2	458,000	0	NA
Urban Conflagration	Low	Low developed density	0.9	4,886,360	0.5	623,387	1	1,432,468	0	0	2	702,000	0	NA
	Moderate	Moderate developed density	2.2	11,644,091	1.6	2,202,633	0	0	1	106,695	10	13,442,761	0	NA
	High	High developed density	0.2	831,721	0.5	623,387	0	0	0	0	1	118,000	0	NA
Wildland Fire	Low	Low fuel rank	0.1	311,895	0.0	0	0	0	0	0	1	229,000	0	NA
	Moderate	Moderate fuel rank	3.2	16,426,486	2.6	3,643,350	1	1,432,468	1	106,695	14	14,284,761	0	NA
	High	High fuel rank	0.3	1,559,477	0.1	96,971	1	1,432,468	0	0	5	963,000	0	NA
	Very high	Very high fuel rank	0.0	0	0.7	900,448	0	0	0	0	0	0	0	NA

¹Estimated value.

### *Dam Failure*

There are no residential structures, critical facilities or infrastructure within a dam failure inundation area in Fort Bragg.

### *Earthquake*

PGA shake maps produced by the USGS show that three critical infrastructure utilities (Noyo River intake Pump Station, KSAY Channels 253 and 98.5 FM) cumulatively valued at \$567,000 fall within a very strong shaking range (20 to 40 percent acceleration due to gravity). All critical facilities except the Glass Beach/MacKerricher State Park are within a severe shaking range (40 to 60 percent acceleration due to gravity) and worth \$24,454,083. Critical infrastructure in the severe shaking range includes 3.4 miles of highway and railroad, and two bridges worth \$40,300,192.

There are 2,243 residential buildings (worth \$432,821,000) and 32 nonresidential buildings (worth \$84,282,000) in the severe shaking range. Estimated residential population in the severe shaking range is 7,026.

There are no critical facilities, utilities, residential, or nonresidential structures located within the violent shaking range.

### *Flood*

According to the FIRM, last updated for Fort Bragg in June 1992, 0.1 mile of highway (worth \$727,756), 0.6 mile of railroad (worth \$817,329), two bridges (worth \$2,864,936), the South Noyo Harbor Lift Station (worth \$229,000) and Glass Beach/MacKerricher State Park (worth \$237,238) are within the 100-year floodplain. Facilities, utilities, and other buildings within the 100-year floodplain have a 1 percent probability of occurrence in any given year and are considered to be at high risk of flooding.

There are 19 residential buildings (worth \$3,865,000) and 1 nonresidential building (worth \$849,000) located within the 100-year floodplain. Estimated residential population within the 100-year floodplain is 70.

A moderate risk is assigned to facilities, utilities, and other buildings within the 500-year floodplain; however, Fort Bragg has none in this risk category.

### *Hazardous Materials Event*

Using the National Response Center and the EPA's Environmental Facts Multisystem Query to locate hazardous waste handling facilities and businesses that generate hazardous waste from their activities, 18 critical facilities (worth \$16,808,917) are at risk for a hazardous material event within ¼ mile of transportation routes. There is also a considerable amount of critical infrastructure at risk located within ¼ mile of transportation routes including 12 utilities, 2 bridges, 3.4 miles of railroad, and 3.6 miles of highway, cumulatively valued at \$28,366,218.

The Corporation Yard (worth \$1,029,000) is the only critical facility at risk from a hazardous material event located within ¼ mile of EHS sites. Critical infrastructure located in this same

radius includes the water and wastewater treatment plants and the South Fort Bragg Booster Station valued at \$12,521,000.

There are 995 residential buildings (worth \$203,952,000), 28 nonresidential buildings (worth \$74,149,000), and an estimated population of 3,170 at risk for a hazardous material event within ¼ mile of transportation routes. There are 13 residential buildings (worth \$3,505,000), 1 nonresidential building (worth \$1,589,000), and an estimated population of 44 at risk for a hazardous materials event with ¼ mile of an EHS site.

### *Landslide*

USGS elevation datasets were used to determine the risk of landslides in Fort Bragg. The slope inclination data assigns landslide potentials at 0 to 14 degrees (0 to 25 percent) (low), 14 to 32 degrees (25 to 65 percent) (medium), and 32 to 72 degrees (65 percent and above) (high). With the exception of 0.1 mile of highway (worth \$519,826), 0.2 mile of railroad (worth \$221,649), and one bridge (worth \$1,432,468) located in a moderate landslide risk area, this analysis reveals that all other critical facilities and infrastructure are in areas of low risk for landslide. No critical facilities or infrastructure is located in an area of high landslide risk.

There are 47 residential buildings (worth \$9,018,000), 1 nonresidential building (worth \$646,000), and an estimated population of 147 located in a moderate landslide risk area. All other residential and nonresidential buildings and people are located in a low landslide risk area.

### *Tsunami*

A 10-foot maximum run-up area was used to categorize moderate risk to facilities, infrastructure, and other buildings based on NOAA models for maximum run-up future scenarios. There are no critical facilities at risk of tsunami impacts; however, critical infrastructure including 0.3 mile of highway (worth \$1,611,459), 0.6 mile of railroad (worth \$831,182), 2 bridges (worth \$2,864,936), and the South Noyo Harbor and North Harbor Lift Stations (valued at \$458,000) are within the tsunami run-up area.

There are 2,243 residential buildings (worth \$432,821,000), 32 nonresidential buildings (worth \$84,282,000), and an estimated population of 7,026 located in the tsunami run-up area.

### *Urban Conflagration*

Intensity of development, determined by the percentage of impervious surfaces, determines the risk of urban conflagration. Impervious surfaces accounting for 20 to 49 percent of total cover is considered low developed density and facilities, infrastructure, and other buildings categorized as such are at low risk to this hazard. There are 10 critical facilities and critical infrastructure including, 0.9 mile of highway, 0.5 mile of railroad, one bridge, the Highway 20 Water Tank, and the Pudding Creek Lift Station are at low risk to urban conflagration (worth \$16,041,381).

Moderate developed density includes areas with impervious surfaces accounting for 50 to 79 percent of total cover and facilities, infrastructure, and other buildings categorized as such are at moderate risk to this hazard. Eight critical facilities worth \$4,954,605 are at moderate risk to urban conflagration. Critical utilities at moderate risk include 2.2 miles of highway (worth

\$11,644,091), 1.6 miles of railroad (worth \$2,202,633), the Mendocino Transit Authority (worth \$106,695), and 10 utilities (worth \$13,442,761).

Areas with a high risk to urban conflagration include high density areas with large numbers of people who reside and/or work in areas with impervious surfaces that account for 80 to 100 percent of total cover. Critical facilities and infrastructure at high risk to this hazard include Fort Bragg High School (worth \$590,000), City Hall (worth \$5,377,000), KMFB and KPMO (worth \$118,000), 0.2 mile of highway (worth \$831,721), and 0.5 mile of railroad (worth \$623,387).

There are 520 residential buildings (worth \$96,598,000), 4 nonresidential buildings (worth \$8,746,000), and an estimated population of 1,601 located in the low risk area; 1,348 residential buildings (worth \$259,515,000), 17 nonresidential buildings (worth \$55,012,000), and an estimated population of 4,237 located in the moderate risk area; and 37 residential buildings (worth \$9,579,000), 6 nonresidential buildings (worth \$12,367,000), and an estimated population of 121 located in the high risk area.

### ***Wildland Fire***

Wildland fire hazard areas were identified for this plan by determining the amount of fuel in a given area. The wildland fire model takes into account slope, aspect, and fuel to determine the ranking. This model shows that there is 0.1 mile of highway (worth \$311,895) and the South Noyo Harbor Lift Station (worth \$229,000) is at low risk of wildland fire.

There are 26 critical facilities and critical infrastructure including 14 utilities, the Mendocino Transit Authority, one bridge, 2.6 miles of railroad, and 3.2 miles of highway at moderate risk to wildland fire (worth \$52,416,367). Critical facilities at high risk to wildland fire is the Mendocino Coast Christian School (worth \$590,000), Pomo Bluffs Park (worth \$237,238), Fort Bragg Fire Department-Highway 20 Station (worth \$867,000), Highway 20 Water Tank (worth \$305,000), Noyo River Intake Pump Station (worth \$331,000), Native American Lift Station (worth \$91,000), and KSAY Channels 253 and 98.5 FM (worth \$236,000). Critical infrastructure at high risk to wildland fire includes 0.3 miles of highway (worth \$1,559,477) 0.1 miles of railroads (worth \$96,971), 1 bridge (worth \$1,432,468), and five utilities (worth \$963,000).

The Otis R. Johnson Park and 0.7 mile of railroad are at very high risk of wildland fire (worth \$1,137,686).

There are 8 residential buildings (worth \$1,978,000), 1 nonresidential buildings (worth \$913,000), and an estimated population of 32 located in the low risk area; 2,116 residential buildings (worth \$407,953,000), 29 nonresidential buildings (worth \$81,120,000), and an estimated population of 6,644 located in the moderate risk area; 82 residential buildings (worth \$15,765,000), 2 nonresidential buildings (worth \$1,858,000), and an estimated population of 256 located in the high risk area; and 37 residential buildings (worth \$6,689,000) with an estimated population of 88 located in the very high risk area.

**Table I-6 City of Fort Bragg Legal and Regulatory Resources Available for Hazard Mitigation**

Regulatory Tool	Name		Effect on Hazard Mitigation
Plans	Emergency Operations Plan		The plan identifies City’s emergency planning, organization, policies, procedures and responses to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies. The plan also addresses integration and coordination with other governmental levels when required.
	City Hall Fire Plan		The plan describes measures to take to prevent a fire as well as procedures to follow when a fire occurs.
	Tsunami Contingency Plan		The plan provides guidance to City and police staff regarding procedures to be used during a Tsunami Alert event.
	General Plan Element 8 - Safety		This Element deals with protection of the community from unreasonable risks associated with effects from earthquakes, landslides, slope instability, subsistence, other geologic hazards, floods and fire.
Programs	National Flood Insurance Program (NFIP)		Makes affordable flood insurance available to homeowners, business owners, and renters in participating communities. In exchange, those communities must adopt and enforce minimum floodplain management regulations to reduce the risk of damage from future floods.
	Policies Title 6 Health and Sanitation	Chapter 6.12 Nuisances	Whenever any condition on or use of property causes or constitutes, or reasonably appears to cause or constitute an imminent or immediate danger to the health and safety of the public, the condition or use may be summarily abated by the city without notice or hearing.
		Chapter 6.20 Burning Regulations and Restrictions	This chapter provides for regulation regarding the open burning of materials.
Policies (Municipal Codes)	Title 9 Pubic Peace, Safety and Morals	Chapter 9.20 Fireworks	Unless otherwise provided by law, it is unlawful for any person, or persons, firm or corporation to sell, dispose of or give away, ignite, fire or explode any rockets, bombs, firecrackers or fireworks of any kind or description whatsoever within the corporate limits of the City.

**Table I-6 City of Fort Bragg Legal and Regulatory Resources Available for Hazard Mitigation**

Regulatory Tool	Name	Effect on Hazard Mitigation	
	Title 15 Buildings and Construction	Chapter 15.04 Adoption of Codes	The purpose of this chapter is to provide minimum standards to safeguard life, health, property and public welfare by regulating and controlling building, plumbing, heating and electrical installations of all buildings and structures within the city.
		Chapter 15.32 Flood Damage Prevention Regulations	The areas of special flood hazard identified by the Federal Insurance Administration, through the Federal Emergency Management Agency with an accompanying Flood Insurance Rate Map is adopted.
			Located within areas of special flood hazard established in Section 15.32.020 are areas designated as floodways. The floodway is an extremely hazardous area due to the velocity of flood waters which carry debris, potential projectiles, and erosion potential.
	Chapter 15.05 Uniform Fire Code	This chapter shall apply to all buildings, structures, areas and occupancies within the jurisdiction. Pursuant to Health and Safety Code Section 13145 and 13146 the fire chief, or his or her authorized representative, shall enforce the provisions of this chapter and all other building standards and regulations relating to fire and panic safety that have been formally adopted by the State Fire Marshal for the prevention of fire and for the protection of life and property against fire or panic.	
Title 18 Coastal Zone	18.61.026 Hazards	Provides standards to minimize risks to life and property in areas of high geologic and flood hazard, assure structural integrity and stability, neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area.	

**Table I-7 City of Fort Bragg Administrative and Technical Resources for Hazard Mitigation**

<b>Staff/Personnel Resources</b>	<b>Department/Division Position</b>
Planner(s) or engineer(s) with knowledge of land development and land management practices	Community Development Department; Director
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Public Works Department/Engineering Division; Director/Associate City Engineer Mendocino Co. Building Department; Sr. Bldg Inspector
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	Public Works Department; Director/Associate City Engineer Community Development Department; Director
Floodplain manager	Community Development Department; Director
Personnel skilled in GIS and/or HAZUS-MH	Public Works Department; Director/Associate City Engineer
Director of Emergency Services	City Manager
Finance (grant writers, purchasing)	Finance Department; Director
Public Information Officers	City Clerk

**Table I-8 City of Fort Bragg Financial Resources for Hazard Mitigation**

<b>Financial Resources</b>	<b>Effect on Hazard Mitigation</b>
General funds	If funds are available, they can be used for hazard mitigation.
Authority to levy taxes for specific purposes	Yes, the City has the authority to level taxes for host of purposes (including hazard mitigation) but there are a number of procedural requirements that would be necessary and it would be subject to voter approval.
Incur debt through general obligation bonds	Possibly, but the City would need to check with their Bond Counsel.
Incur debt through special tax and revenue bonds	Possibly, but the City would need to check with their Bond Counsel.
Incur debt through private activity bonds	Possibly, but the City would need to check with their Bond Counsel.
Hazard Mitigation Grant Program (HMGP)	FEMA funding which is available to local communities after a Presidentially-declared disaster. It can be used to fund both pre- and post-disaster mitigation plans and projects.
Pre-Disaster Mitigation (PDM) grant program	FEMA funding which available on an annual basis. This grant can only be used to fund pre-disaster mitigation plans and projects only.
Flood Mitigation Assistance (FMA) grant program	FEMA funding which is available on an annual basis. This grant can be used to mitigate repetitively flooded structures and infrastructure to protect repetitive flood structures.
United State Fire Administration (USFA) Grants	The purpose of these grants is to assist state, regional, national or local organizations to address fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors and firefighters.
Fire Mitigation Fees	Finance future fire protection facilities and fire capital expenditures required because of new development within Special Districts.

**Table I-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
4.A	Strengthen, abate, or downgrade in occupancy, any structures that are owned or leased by the County or incorporated communities that do not meet the California Building Code (CBC) requirements for seismic safety or the California Codes Essential Services Building Act.	High Priority	Public Works	HMGP or PDM funding	1-3 years	As shown in the exposure analysis, a major earthquake poses the greatest risk of any hazard to Fort Bragg critical facilities. Mitigating structures that do not meet code would reduce the risk of exposure and help Mendocino County respond to and recover from this hazard.
4.B	Develop a voluntary building inspection program in which homes and/or businesses are inspected by a building official for weak or poorly anchored parapets, signs, glass, machinery, shelving, fixtures, and other nonstructural elements or architectural detailing that might cause injury if they were to fall or break during an earthquake.	High Priority	Community Development	HMGP or PDM funding	1-2 years	This action will prevent future residential and nonresidential losses of unreinforced masonry buildings in the future. The retrofitting of unreinforced masonry buildings is a high priority for the State of California.
4.E	Develop an unreinforced masonry grant program to correct problems, such as bracing chimneys, on residential and nonresidential buildings.	High Priority	Community Development	HMGP or PDM funding	1-2 years	This action will prevent future residential and nonresidential losses of unreinforced masonry buildings in the future. The retrofitting of unreinforced masonry buildings is a high priority for the State of California.

**Table I-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
5.G	Underground utilities or clear right-of-way for utilities that provide power and communication to critical facilities and are at-risk to failure during a winter storm event.	High Priority	Public Works	HMGP or PDM funding	2-4 years	Ungrounding utilities and/or clearing the right-of-way will help ensure that they will function during a winter storm event, which generally occurs every 3-4 years. Functioning utilities will provide power, water, and sewer to the local government, general public, and private business owners.
5.H	Retrofit wastewater and potable water facilities that subject to flooding. Retrofitting activities may include elevating vulnerable equipment, electrical controls, and other equipment, fastening and sealing manhole covers to prevent floodwater infiltration, and protecting wells and other potable water from infiltration and flood damage by raising controls and well pipes.	High Priority	Public Works	HMGP or PDM funding	2-4 years	Several critical facilities, including WW and PW facilities were damaged in Disaster 1628. This action will help ensure that the community/critical facilities can operate in some capacity before, during, and after a future flood/winter storm event.
9.A	Develop an urban fire prevention program that provides grant funding for property owners to update public structures that currently not meet the CBC and California Fire Code.	High Priority	Community Development	HMGP or PDM funding	2-4- years	This action will prevent future residential and nonresidential losses of from urban fires. Retrofitting/upgrading structures to meet the CBC and California Fire Code is a high priority of the City.

**Table I-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
10.B	Create a vegetation management program that provides vegetation management services to elderly, disabled, or low-income persons who lack the resources to remove flammable vegetation around their homes.	High Priority	Public Works	HMGP or PDM funding	1-3 years	This program will help mitigate wildland fire hazards around vulnerable populations. Protecting vulnerable populations from a disaster is FEMA and CDC goal.

**Appendix J**  
**City of Point Arena**

**Table J-1 City of Point Arena Estimated Population and Building Inventory**

Population		Residential Buildings		Nonresidential Buildings	
2000 Census	Estimated 2005 Census	Total Building Count	Total Value of Buildings (\$)¹	Total Building Count	Total Value of Buildings (\$)²
474	475	178	28,005,000	4	15,177,000

Sources: FEMA HAZUS-MH, Version 2006, and U.S. Census 2000.

¹Average insured structural value of all residential buildings (including single-family dwellings, mobile homes, etc.) is \$157,000 per structure.

²Averaged insured structural value of all nonresidential buildings (including industry, trade, professional and technical services, etc.) is \$3,794,000.

**Table J-2 City of Point Arena Critical Facilities and Infrastructure**

	Name / Number	Address	Value¹
Government	City Warehouse	247 Main St.	1,180,000
	City Hall	451 School St.	6,659,000
Emergency Response	Redwood Coast Fire Department	19601 S. Highway 1	708,000
Educational	Pacific Community Charter School	10 Lake St.	590,000
	Point Arena Elementary School	20 School St.	590,000
	Point Arena High School	270 Lake St.	590,000
	South Coast Continuation School	185 Lake St.	590,000
	Coast Christian Academy	95 Riverside Dr.	590,000
Care	RCMS	30 Mill St.	1,421,690
	South Coast Senior Center	140 Main St.	1,421,690
Community	City Pier	850 Port Rd.	2,300,000
	Point Arena City Park	230 Main St.	237,238
	Point Arena Lighthouse and Museum	45500 Lighthouse Rd.	1,219,578
State and Federal Highways	1.46 miles	---	7,589,452
Railroads	0	0	0
Bridges	0	0	0
	Wastewater Treatment Plant	105 Iversen Ave.	1,650,000
	PGE Substation	Windy Hollow Rd.	10,000,000

Sources: FEMA HAZUS-MH, local jurisdictions.

¹Estimated and/or insured structural value for critical facilities and estimated values for critical infrastructure.

**Table J-3 City of Point Arena Potential Hazard Exposure Analysis Overview – Population and Buildings**

			Population	Buildings			
				Residential		Nonresidential	
Hazard Type	Hazard Area	Methodology	Number	Number	Value (\$) <sup>1</sup>	Number	Value (\$) <sup>1</sup>
Dam Failure	High	Inundation area	0	0	0	0	0
Earthquake	Very strong	20-40% (g)	0	0	0	0	0
	Severe	>40-60% (g)	474	178	28,005,000	4	15,177,000
	Violent	>60-80% (g)	0	0	0	0	0
Flood	Moderate	500-year floodplain	1	1	101	0	0
	High	100-year floodplain	20	8	1,520,000	0	0
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	306	113	18,150,000	3	12,109,000
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	0	0	0	0	0
Landslide	Low	0-14 degrees	430	160	24,805,000	3	13,675,000
	Moderate	>14-32 degrees	41	17	2,902,000	0	0
	High	>32-56 degrees	2	1	200,000	0	0
Tsunami	Moderate	10-foot maximum run-up area	175	68	11,359,000	3	6,713,000
Urban Conflagration	Low	Low developed density	72	26	3,897,000	1	3,067,000
	Moderate	Moderate developed density	23	8	1,247,000	0	0
	High	High developed density	0	0	0	0	0
Wildland Fire	Low	Low fuel rank	26	9	1,289,000	0	0
	Moderate	Moderate fuel rank	321	117	18,121,000	3	10,425,000
	High	High fuel rank	93	38	6,383,000	1	2,883,000
	Very high	Very high fuel rank	34	13	2,169,000	0	0

<sup>1</sup>Estimated and/or insured structural value.

**Table J-4 City of Point Arena Potential Hazard Exposure Analysis Overview – Critical Facilities**

Hazard Type	Hazard Area	Methodology	Government		Emergency Response		Educational		Care		Community	
			No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹
Dam Failure	High	Inundation area	0	0	0	0	0	0	0	0	0	0
Earthquake	Very strong	20-40% (g)	0	0	0	0	0	0	0	0	0	0
	Severe	>40-60% (g)	2	7,839,000	0	0	5	2,950,000	2	2,843,380	3	3,756,816
	Violent	>60-80% (g)	0	0	1	708,000	0	0	0	0	0	0
Flood	Moderate	500-year floodplain	0	0	0	0	0	0	0	0	0	0
	High	100-year floodplain	0	0	0	0	0	0	0	0	1	2,300,000
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	2	7,839,000	1	708,000	5	2,950,000	2	2,843,380	1	237,238
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	0	0	0	0	0	0	0	0	0	0
Landslide	Low	0-14 degrees	2	7,839,000	1	708,000	5	2,950,000	2	2,843,380	3	3,756,816
	Moderate	>14-32 degrees	0	0	0	0	0	0	0	0	0	0
	High	>32-56 degrees	0	0	0	0	0	0	0	0	0	0
Tsunami	Moderate	10-foot maximum run-up area	0	0	0	0	0	0	0	0	1	2,300,000
Urban Conflagration	Low	Low developed density	1	1,180,000	0	0	3	1,770,000	1	1,421,690	0	0
	Moderate	Moderate developed density	0	0	0	0	1	590,000	1	1,421,690	2	3,519,578
	High	High developed density	0	0	0	0	0	0	0	0	0	0
Wildland Fire	Low	Low fuel rank	1	1,180,000	0	0	0	0	0	0	0	0
	Moderate	Moderate fuel rank	1	6,659,000	1	708,000	5	2,950,000	2	2,843,380	1	1,219,578
	High	High fuel rank	0	0	0	0	0	0	0	0	2	2,537,238
	Very high	Very high fuel rank	0	0	0	0	0	0	0	0	0	0

¹Estimated and/or insured structural value.

**Table J-5 City of Point Arena Potential Hazard Exposure Analysis Overview – Critical Infrastructure**

Hazard Type	Hazard Area	Methodology	Highways		Railroads		Bridges		G&A Facilities		Utilities		Dams	
			Miles	Value (\$) <sup>1</sup>	Miles	Value (\$) <sup>1</sup>	No.	Value (\$) <sup>1</sup>	No.	Value (\$) <sup>1</sup>	No.	Value (\$) <sup>1</sup>	No.	Value (\$) <sup>1</sup>
Dam Failure	High	Inundation area	0.0	0	0	0	0	0	0	0	0	0	0	NA
Earthquake	Very strong	20-40% (g)	0.0	0	0	0	0	0	0	0	0	0	0	NA
	Severe	>40-60% (g)	1.5	7,589,452	0	0	0	0	0	0	1	1,650,000	0	NA
	Violent	>60-80% (g)	0.0	0	0	0	0	0	0	0	1	10,000,000	0	NA
Flood	Moderate	500-year floodplain	0.0	0	0	0	0	0	0	0	0	0	0	NA
	High	100-year floodplain	0.2	1,247,581	0	0	0	0	0	0	1	1,650,000	0	NA
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	1.5	7,589,452	0	0	0	0	0	0	0	0	0	NA
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	0.0	0	0	0	0	0	0	0	2	11,650,000	0	NA
Landslide	Low	0-14 degrees	1.5	7,589,452	0	0	0	0	0	0	0	0	0	NA
	Moderate	>14-32 degrees	0.0	0	0	0	0	0	0	0	0	0	0	NA
	High	>32-56 degrees	0.0	0	0	0	0	0	0	0	0	0	0	NA
Tsunami	Moderate	10-foot maximum run-up area	0.0	0	0	0	0	0	0	0	0	0	0	NA
Urban Conflagration	Low	Low developed density	0.6	2,963,005	0	0	0	0	0	0	0	0	0	NA
	Moderate	Moderate developed density	0.2	987,668	0	0	0	0	0	0	0	0	0	NA
	High	High developed density	0.0	0	0	0	0	0	0	0	0	0	0	NA
Wildland Fire	Low	Low fuel rank	0.3	1,299,564	0	0	0	0	0	0	0	0	0	NA
	Moderate	Moderate fuel rank	1.1	5,562,133	0	0	0	0	0	0	2	11,650,000	0	NA
	High	High fuel rank	0.1	311,895	0	0	0	0	0	0	0	0	0	NA
	Very high	Very high fuel rank	0.1	467,843	0	0	0	0	0	0	0	0	0	NA

<sup>1</sup>Estimated value.

### *Dam Failure*

There are no critical facilities or utilities within a dam failure hazard area in Point Arena.

### *Earthquake*

PGA shake maps produced by the USGS show that neither critical facilities and infrastructure nor non-critical facilities fall within a very strong shaking range (20 to 40 percent acceleration due to gravity). Twelve critical facilities are within a severe shaking range (40 to 60 percent acceleration due to gravity), including two government facilities (worth \$7,839,000), 5 educational facilities (worth \$2,950,000), 2 care facilities (worth 2,843,380), and 3 community facilities (worth \$3,756,816). Critical infrastructure, including 1.54 miles of highway (worth \$7,589,452), and the wastewater treatment plant (\$1,650,000) are within a severe shaking range. There are 178 residential buildings (worth more than \$28,005,000), 4 nonresidential buildings (\$15,177,000), and an estimated population of 474 in this severe shaking range area.

The Redwood Coast Fire Department (valued at \$708,000) and the PGE Substation (worth \$10,000,000) are located within a violent shaking range (60 to 80 percent acceleration due to gravity).

### *Flood*

According to the FIRM, last updated for Point Arena in June 1986, the City Pier (worth \$2,300,000), 0.2 mile of highway (worth \$1,247,581), and the Wastewater Treatment Plant (valued at \$1,650,000) are within the 100-year floodplain. Eight residential buildings (worth \$1,520,000) and approximately 20 people are also within the 100-year floodplain. Facilities, utilities, and other buildings within the 100-year floodplain have a 1 percent probability of occurrence in any given year and are considered to be at high risk of flooding.

A moderate risk is assigned to facilities, utilities, infrastructure, and other buildings within the 500-year floodplain. Point Arena has no critical facilities or utilities located in areas within the 500-year floodplain; however, there is 1 person living in 1 residential structure located in this moderate risk area valued at \$101,000.

### *Hazardous Materials Event*

Using the National Response Center and the EPA's Environmental Facts Multisystem Query to locate hazardous waste handling facilities and businesses that generate hazardous waste from their activities, 1.5 miles of highway valued at \$1,247,581 and 11 critical facilities (worth \$14,577,618) are at risk for a hazardous material event within ¼ mile of transportation routes. There are also 113 residential buildings (worth \$18,150,000), 3 nonresidential buildings (worth \$12,109,000), and approximately 306 people located within this ¼ mile buffer area.

The Wastewater Treatment Plant (worth \$1,650,000) and the PGE Substation (worth \$10,000,000) are at risk from a hazardous material event located within ¼ mile of EHS sites.

### *Landslide*

USGS elevation datasets were used to determine the risk of landslides in Point Arena. The slope inclination data assigns landslide potentials at 0 to 14 degrees (0 to 25 percent) (low), 14 to 32 degrees (25 to 65 percent) (medium), and 32 to 72 degrees (65 percent and above) (high). This analysis reveals that all critical facilities (valued at \$29,747,196) are in areas of low risk for landslide include 1.5 miles of highway (worth \$7,589,452). There are 160 residences valued at \$24,805,000, 3 nonresidential buildings (worth \$13,675,000), and approximately 430 people in this low hazard area. Seventeen residences (worth \$2,902,000) and approximately 41 people are located in a moderate landslide risk area. Two people living in 1 residence valued at \$200,000, is located in an area of high landslide risk.

### *Tsunami*

A 10-foot maximum run-up area was used to categorize moderate risk to facilities, infrastructure, and other buildings based on NOAA models for maximum run-up future scenarios. The City Pier (worth \$2,300,000) along with 68 residences (worth \$11,359,000), 3 nonresidential buildings (worth \$6,713,000) and approximately 175 people are located within the run-up area.

### *Urban Conflagration*

Intensity of development, determined by the percentage of impervious surfaces, determines the risk of urban conflagration. Impervious surfaces accounting for 20 to 49 percent of total cover is considered low developed density and facilities, infrastructure, and other buildings categorized as such are at low risk to this hazard. The City Warehouse (worth \$1,180,000), three area schools (Arena Elementary School, Point Arena High School, and South Coast Continuation), each valued at \$590,000, RCMS (worth \$1,421,690), and 0.6 mile of highway (worth \$2,963,005) are at low risk to urban conflagration. There are 26 residences valued at \$3,897,000, 1 nonresidential building (worth \$3,067,000), and approximately 72 people also at low risk to this hazard.

Moderate developed density includes areas with impervious surfaces accounting for 50 to 79 percent of total cover and facilities, infrastructure, and other buildings categorized as such are at moderate risk to this hazard. There is 0.2 mile of highway (worth \$987,668) and 4 critical facilities at moderate risk to urban conflagration including the South Coast Senior Center (worth 1,421,690), the Pacific Community Charter School (worth \$590,000), the Point Arena Lighthouse and Museum (worth \$1,219,578), and the City Pier (worth \$2,300,000). There are also approximately 23 people living in 8 residences (worth \$1,247,000).

Areas with a high risk to urban conflagration include high density areas with large numbers of people who reside and/or work in areas with impervious surfaces that account for 80 to 100 percent of total cover. Neither critical facilities and critical infrastructure nor non-critical facilities are at high risk to this hazard.

### *Wildland Fire*

Wildland fire hazard areas were identified for this plan by determining the amount of fuel in a given area. The wildland fire model takes into account slope, aspect, and fuel to determine the ranking. This model shows that there is 0.1 mile of highway (worth \$1,299,564) and the City

Warehouse (worth \$1,180,000) are at low risk of wildland fire. Approximately 26 people living in 9 residences (worth \$1,289,000) are also at low risk of wildland fire.

Within the moderate risk wildland fire area are 117 residences valued at \$18,121,000, three non-residential buildings (worth \$10,425,000), 1.1 miles of highway (worth \$5,562,133), and 10 critical facilities. Critical facilities in this area include City Hall (worth 6,659,000), Redwood Coast Fire Department (\$708,000), all 5 critical educational facilities in Point Arena (totaling \$2,950,000), both critical care facilities in the City (worth \$2,843,380), the Point Arena Lighthouse and Museum (worth \$1,219,578), and 2 utilities—the Wastewater Treatment Plant and the PGE Substation (worth \$11,650,000). There are also 117 residences (worth \$18,121,000), 3 nonresidential buildings (worth \$10,425,000), and approximately 321 people in the moderate risk wildland fire area.

In an area with high risk to wildland fire are the Point Arena City Park and City Pier (worth \$2,537,238) and 1.1 miles of highway (worth \$311,895). There are also 38 homes valued at \$6,383,000, 1 nonresidential building worth \$2,883,000, and approximately 93 people.

Within the very high-risk wildland fire area are approximately 34 people living in 13 residences (worth \$2,169,000) and 0.1 mile of highway worth \$467,843.

**Table J-6 City of Point Arena Legal and Regulatory Resources Available for Hazard Mitigation**

Regulatory Tool	Name		Effect on Hazard Mitigation
Plans	General Plan		<p>The underlying assumption of this element is that the City can reduce the hazards caused by certain natural occurrences if the probabilities of such conditions are known in advance and plans for dealing with them are prepared.</p> <p>State law requires that the Safety Element address the protection of the community from unreasonable risks associated with the effects of seismically-induced surface rupture, ground shaking, ground failure, tsunami and seiche; slope instability due to mudslides and landslides; subsidence and other known geologic hazards; flooding; and wildland and urban fires.</p> <p>After setting forth public health and safety goals, the implementing policies and programs of this element are presented. They are divided into eight sections: seismic safety; flood hazards and control; slope stability; fire protection; air quality; water supply and quality; waste water collection and treatment; emergency preparedness; and hazardous materials transportation and storage.</p>
Programs	National Flood Insurance Program (NFIP)		Makes affordable flood insurance available to homeowners, business owners, and renters in participating communities. In exchange, those communities must adopt and enforce minimum floodplain management regulations to reduce the risk of damage from future floods.
Policies (Municipal Code)	Chapter 2.25 Emergency Services	Section 2.25.020	The purposes of this chapter are to provide for the preparation and carrying out of plans for the protection of persons and property within the city of Point Arena in the event of an emergency; the establishment, coordination, and direction of the city emergency organization; the establishment, coordination and direction of the disaster council; the establishment, coordination and direction of the office of emergency services; and the coordination of the emergency functions of this city with all other public agencies, corporations, organizations and affected private persons.

**Table J-6 City of Point Arena Legal and Regulatory Resources Available for Hazard Mitigation**

Regulatory Tool	Name		Effect on Hazard Mitigation
	Chapter 15.05 UNIFORM CODES	Section 15.05.010	<p><b>13.1.2 15.05.010 Adoption by reference – Uniform codes.</b></p> <p>The city council of the city of Point Arena does hereby adopt the following uniform codes, and any amendments thereto, to be enforced within the Point Arena city limits:</p> <ul style="list-style-type: none"> <li>(1) 1994 Edition of the Uniform Fire Code;</li> <li>(2) 1994 Edition of the Uniform Housing Code;</li> <li>(3) 1994 Edition of the Uniform Building Code;</li> <li>(4) 1994 Edition of the Uniform Plumbing Code;</li> <li>(5) 1994 Edition of the Uniform Mechanical Code;</li> <li>(6) 1993 Edition of the National Electrical Code. [Res. 05-99, 1999.]</li> </ul>

**Table J-7 City of Point Arena Administrative and Technical Resources for Hazard Mitigation**

<b>Staff/Personnel Resources</b>	<b>Department/Division Position</b>
Planner(s) or engineer(s) with knowledge of land development and land management practices	Contractor
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Contractor
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	Contractor
Floodplain manager	City Clerk
Personnel skilled in GIS and/or HAZUS-MH	Not Available
Director of Emergency Services	City Clerk
Finance (grant writers, purchasing)	City Clerk
Public Information Officers	City Clerk

**Table J-8 City of Point Arena Financial Resources for Hazard Mitigation**

<b>Financial Resources</b>	<b>Effect on Hazard Mitigation</b>
General funds	Not available for hazard mitigation.
Authority to levy taxes for specific purposes	Not available for hazard mitigation.
Incur debt through general obligation bonds	Not available for hazard mitigation.
Incur debt through special tax and revenue bonds	Not available for hazard mitigation.
Incur debt through private activity bonds	Not available for hazard mitigation.
Hazard Mitigation Grant Program (HMGP)	FEMA funding which is available to local communities after a Presidentially-declared disaster. It can be used to fund both pre- and post-disaster mitigation plans and projects.
Pre-Disaster Mitigation (PDM) grant program	FEMA funding which available on an annual basis. This grant can only be used to fund pre-disaster mitigation plans and projects only.
Flood Mitigation Assistance (FMA) grant program	FEMA funding which is available on an annual basis. This grant can be used to mitigate repetitively flooded structures and infrastructure to protect repetitive flood structures.
United State Fire Administration (USFA) Grants	The purpose of these grants is to assist state, regional, national or local organizations to address fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors and firefighters.
Fire Mitigation Fees	Finance future fire protection facilities and fire capital expenditures required because of new development within Special Districts.

**Table J-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
1.B	Integrate elements from the MHMP into other local planning documents, including the safety element section of general plans, hazard-specific zoning ordinances, and emergency operation plans.	High Priority	Planning	General funds	1-2 years	The integration of the MJHMP elements into planning documents will help ensure consistency across all types and all phases of planning.
2.A	Develop a sustained public outreach program that encourages consistent hazard mitigation content. For example, consider publishing tsunami inundation maps in telephone books, wildland fire defensible space tips with summer water bills or along highway billboards, and the safe handling and disposal of hazardous waste and chemicals with garbage bills.	High Priority	Fire District	HMGP or PDM funding	0-1 year	A sustained mitigation outreach program will help build and support countywide capacity to enable the public to prepare for, respond to, and recover from disasters.
2.F	Retrofit critical infrastructure or mitigate land (e.g., slope stabilization, vegetation management) around critical infrastructure so that the infrastructure provides safe ingress for emergency response vehicles and safe egress for community members before or during a disaster.	High Priority	Fire District	HMGP or PDM funding	1-2 years	Critical infrastructure and land within Point Arena has been damaged from multiple winter storm events. Retrofitting and/or mitigating land will help prevent future damages to the City assets and allow for the safe ingress and

**Table J-9 Mitigation Action Plan Matrix**

Action Number	Description	Ranking/Prioritization	Administering Department	Potential Funding	Timeframe	Benefit-Costs / Technical Feasibility
						egress of community members at risk to winter storm events.
4.A	Strengthen, abate, or downgrade in occupancy, any structures that are owned or leased by the County or incorporated communities that do not meet the California Building Code (CBC) requirements for seismic safety or the California Codes Essential Services Building Act.	High Priority	Planning	HMGP or PDM funding	2-3 years	As shown in the exposure analysis, a major earthquake poses the greatest risk of any hazard to Mendocino County critical facilities. Mitigating structures that do not meet code would reduce the risk of exposure and help Mendocino County respond to and recover from this hazard.
5.H	Retrofit wastewater and potable water facilities that subject to flooding. Retrofitting activities may include elevating vulnerable equipment, electrical controls, and other equipment, fastening and sealing manhole covers to prevent floodwater infiltration, and protecting wells and other potable water from infiltration and flood damage by raising controls and well pipes.	High Priority	Utilities	HMGP or PDM funding	1-3 years	Several critical facilities, including WW and PW facilities were damaged in Disaster 1628. This action will help ensure that the community /critical facilities can operate in some capacity before, during, and after a future flood/winter storm event.

**Table J-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
10.A	Develop a fire road access/roadside vegetation removal program or fuel break program in which live native vegetation should be thinned and/or moved and dead vegetation should be removed within a 50-foot distance of each side of a road. Roads to be included in this program include those located in high or very high areas of this MHMP or defined by Mendocino County Fire Safe Council.	High Priority	Fire District	HMGP or PDM funding	1-2 years	While ongoing maintenance of this type of mitigation action is required, the cost to implement and mitigate a fuel vegetation program is fairly minor when compared to the gained life-safety and property protection benefits.

**Appendix K**  
**City Of Ukiah**

**Table K-1 City of Ukiah Estimated Population and Building Inventory**

Population		Residential Buildings		Nonresidential Buildings	
2000 Census	Estimated 2005 Census	Total Building Count	Total Value of Buildings (\$)¹	Total Building Count	Total Value of Buildings (\$)²
15,497	15,463	4,327	810,724,000	104	265,078,000

Sources: FEMA HAZUS-MH, Version 2006, and U.S. Census 2000.

¹Average insured structural value of all residential buildings, (including single-family dwellings, mobile homes, etc.) is \$187,000 per structure.

²Averaged insured structural value of all nonresidential buildings (including industry, trade, professional and technical services, etc.) is \$2,549,000.

**Table K-2 City of Ukiah Critical Facilities and Infrastructure**

	Name / Number	Address	Value¹
Government	Civic Center	300 Seminary Ave.	6,659,000
	Employment and Family Assistance Services, Adult Services	737 S. State St.	1,180,000
	Family and Children's Services, Child Protective Services	727 S. State St.	1,180,000
Emergency Response	Ukiah Fire Department	300 Seminary Ave.	708,000
	Ukiah Police Department	300 Seminary Ave.	1,652,000
	Ukiah Valley Fire Protection District	1500 S. State St.	708,000
Educational	West Hills Juvenile Hall School	2240 Eastside Rd.	590,000
	Nokomis Elementary School	495 Washington St.	590,000
	St. Mary of the Angels School	991 S. Dora St.	590,000
	Yokayo Elementary School	790 S. Dora St.	590,000
	River Oak Charter School	555 Leslie St.	590,000
	Oak Manor Elementary School	400 Oak Manor Dr.	590,000
	New Morning Montessori School	656 South Orchard Ave.	590,000
	South Valley High School	445 S. Dora St.	590,000
	New Hope School	225 S. Hope St.	590,000
	Pomolita Middle School	740 N. Springs St.	590,000
Frank Zeek Elementary School	1060 N. Bush St.	590,000	

**Table K-2 City of Ukiah Critical Facilities and Infrastructure**

	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
	Ukiah High School	1000 Low Gap Rd.	590,000
	Woodlands Charter School	3801 Low Gap Rd.	590,000
	Calpella Elementary School	151 Moore St.	590,000
Care	Ukiah Valley Medical Center	275 Hospital Drive	8,260,000
Community	Giorno Park / Anton Stadium	506 Park Blvd.	237,238
	Todd Grove Park	600 Live Oak	237,238
	Ukiah Softball Complex	River Rd. Exit	237,238
	Oak Manor Park	500 Oak Manor Dr.	237,238
	Vinewood Park	1260 Elm St.	237,238
	Grace Hudson Museum and Sun House	431 So. Main St.	1,219,578
	Ukiah Municipal Golf Course	599 Park Blvd.	NA
	Low Gap Park	Low Gap Rd.	237,238
State and Federal Highways	5.35	---	27,810,664
Railroads	5.34	---	7,397,523
Bridges	10	---	14,324,680
Ground and Air Facilities	Rail Facility	711 E. Perkins St.	25,724,000
	Ukiah Municipal Airport	1 M south of Ukiah	6,431,000
Utilities	KPRA Channel 208	NA	118,000
	KUKI-FM Channel 277	NA	118,000
	City of Ukiah Wastewater Treatment Plan	300 Plant Rd.	78,588,000
	AT&T Central Switch Station	305 West Stevenson	118,000
	Electric Substation	S. Orchard	10,000
	Hydro Generation Plan	Lake Mendocino Dr.	129,800,000
	Williams Communication Inc.	NA	118,000

**Sources:** FEMA HAZUS-MH, local jurisdictions.

<sup>1</sup>Estimated and/or insured structural value for critical facilities and estimated values for critical infrastructure.

NA = Not Available.

**Table K-3 City of Ukiah Potential Hazard Exposure Analysis Overview – Population and Buildings**

			Population	Buildings			
Hazard Type	Hazard Area	Methodology		Number	Residential		Nonresidential
			Number	Number	Value (\$)¹	Number	Value (\$)¹
Dam Failure	High	Inundation area	7,216	1,755	322,050,000	74	184,428,000
Earthquake	Very strong	20-40% (g)	0	0	0	0	0
	Severe	>40-60% (g)	15,497	4,327	810,724,000	104	265,078,000
	Violent	>60-80% (g)	0	0	0	0	0
Flood	Moderate	500-year floodplain	800	202	38,176,000	4	11,550,000
	High	100-year floodplain	2,241	601	97,273,000	7	17,898,000
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	8,417	1,883	369,961,000	89	229,710,000
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	1,575	276	66,401,000	0	0
Landslide	Low	0-14 degrees	15,134	4,153	780,045,000	102	256,635,000
	Moderate	>14-32 degrees	311	140	25,444,000	2	6,900,000
	High	>32-56 degrees	16	7	1,259,000	0	0
Tsunami	Moderate	10-foot maximum run-up area	0	0	0	0	0
Urban Conflagration	Low	Low developed density	7,151	2,014	378,673,000	33	74,911,000
	Moderate	Moderate developed density	4,316	1,014	192,402,000	50	124,772,000
	High	High developed density	187	57	8,840,000	8	24,282,000
Wildland Fire	Low	Low fuel rank	451	94	19,816,000	7	29,064,000
	Moderate	Moderate fuel rank	14,659	4,085	763,360,000	96	230,151,000
	High	High fuel rank	321	119	22,388,000	1	3,669,000
	Very high	Very high fuel rank	65	28	5,148,000	0	0

¹Estimated and/or insured structural value.

**Table K-4 City of Ukiah Potential Hazard Exposure Analysis Overview – Critical Facilities**

Hazard Type	Hazard Area	Methodology	Government		Emergency Response		Educational		Care		Community	
			No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹
Dam Failure	High	Inundation area	2	2,360,000	0	0	3	1,770,000	1	8,260,000	3	1,694,054
Earthquake	Very strong	20-40% (g)	0	0	0	0	0	0	0	0	0	0
	Severe	>40-60% (g)	3	9,019,000	3	3,068,000	14	8,260,000	1	8,260,000	8	2,643,006
	Violent	>60-80% (g)	0	0	0	0	0	0	0	0	0	0
Flood	Moderate	500-year floodplain	0	0	0	0	0	0	0	0	0	0
	High	100-year floodplain	0	0	0	0	1	590,000	0	0	2	474,476
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	3	9,019,000	3	3,068,000	5	2,950,000	1	8,260,000	3	1,694,054
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	0	0	0	0	0	0	0	0	1	237,238
Landslide	Low	0-14 degrees	3	9,019,000	3	3,068,000	13	7,670,000	1	8,260,000	8	2,643,006
	Moderate	>14-32 degrees	0	0	0	0	1	590,000	0	0	0	0
	High	>32-56 degrees	0	0	0	0	0	0	0	0	0	0
Tsunami	Moderate	10-foot maximum run-up area	0	0	0	0	0	0	0	0	0	0
Urban Conflagration	Low	Low developed density	0	0	0	0	5	2,950,000	0	0	2	1,456,816
	Moderate	Moderate developed density	1	6,659,000	3	3,068,000	6	3,540,000	0	0	0	0
	High	High developed density	2	2,360,000	0	0	1	590,000	1	8,260,000	0	0
Wildland Fire	Low	Low fuel rank	0	0	0	0	2	1,180,000	0	0	2	474,476
	Moderate	Moderate fuel rank	3	9,019,000	3	3,068,000	12	7,080,000	1	8,260,000	6	2,168,530
	High	High fuel rank	0	0	0	0	0	0	0	0	0	0
	Very high	Very high fuel rank	0	0	0	0	0	0	0	0	0	0

¹Estimated and/or insured structural value.

**Table K-5 City of Ukiah Potential Hazard Exposure Analysis Overview – Critical Infrastructure**

Hazard Type	Hazard Area	Methodology	Highways		Railroads		Bridges		G&A Facilities		Utilities		Dams	
			Miles	Value (\$)¹	Miles	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹
Dam Failure	High	Inundation area	4.9	25,263,519	5.3	7,397,523.4	10	14,324,680	2	32,155,000	4	218,506,000	0	NA
Earthquake	Very strong	20-40% (g)	0.0	0	0.0	0.0	0	0	0	0	0	0	0	NA
	Severe	>40-60% (g)	5.4	27,810,664	5.3	7,397,523.4	10	14,324,680	2	32,155,000	7	218,860,000	0	NA
	Violent	>60-80% (g)	0.0	0	0.0	0.0	0	0	0	0	0	0	0	NA
Flood	Moderate	500-year floodplain	0.9	4,470,499	0.8	1,135,949.3	3	4,297,404	0	0	0	0	0	NA
	High	100-year floodplain	0.2	1,039,651	0.8	1,122,096.2	2	2,864,936	1	25,724,000	1	78,588,000	0	NA
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	5.4	27,810,664	5.3	7,397,523.4	9	12,892,212	2	32,155,000	4	88,824,000	0	NA
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	0.5	2,755,075	1.3	1,814,748.2	1	1,432,468	0	0	2	88,588,000	0	NA
Landslide	Low	0-14 degrees	5.4	27,810,664	5.3	7,397,523.4	10	14,324,680	2	32,155,000	6	218,742,000	0	NA
	Moderate	>14-32 degrees	0.0	0	0.0	0.0	0	0	0	0	1	118,000	0	NA
	High	>32-56 degrees	0.0	0	0.0	0.0	0	0	0	0	0	0	0	NA
Tsunami	Moderate	10-foot maximum run-up area	0.0	0	0.0	0.0	0	0	0	0	0	0	0	NA
Urban Conflagration	Low	Low developed density	1.6	8,473,156	2.0	2,812,167.1	5	7,162,340	0	0	0	0	0	NA
	Moderate	Moderate developed density	2.1	11,020,301	1.2	1,690,070.9	1	1,432,468	1	25,724,000	3	139,918,000	0	NA
	High	High developed density	0.2	883,703	0.3	401,738.2	0	0	0	0	0	0	0	NA
Wildland Fire	Low	Low fuel rank	1.9	9,668,754	1.4	1,980,984.7	2	2,864,936	1	6,431,000	1	118,000	0	NA
	Moderate	Moderate fuel rank	3.5	18,037,945	3.9	5,374,979.5	8	11,459,744	1	25,724,000	6	218,742,000	0	NA
	High	High fuel rank	0.0	0	0.0	0.0	0	0	0	0	0	0	0	NA
	Very high	Very high fuel rank	0.0	103,965	0.0	27,706.1	0	0	0	0	0	0	0	NA

¹Estimated value.

### *Dam Failure*

The State of California regulates and inventories dams measuring greater than 25 feet in height and retaining back greater than 15 acre-feet of water or those dams that are more than 6 feet in height and retaining greater than 50 acre-feet of water. Inundation maps were developed for larger dams. Critical facilities, infrastructure, and other buildings within the inundation area are considered to be in high hazard area in the event of dam failure.

There are 1,755 residential structures (worth \$322,050,000), 74 nonresidential buildings (worth 265,078,000), and approximately 7,216 within the inundation area. Several critical facilities are within the inundation area including 2 government facilities (worth \$2,360,000), 3 educational facilities (worth \$1,770,000), 3 community facilities (worth \$1,694,054), 4 utilities (worth \$218,860,000), 2 G&A facilities (worth \$32,155,000), 10 bridges (worth \$14,324,680), 5.3 miles of rail (worth \$7,397,523.4), and 4.9 miles of highway valued at \$25,263,519. There are no dams with a high risk of failure.

### *Earthquake*

PGA shake maps produced by the USGS show that the entire population, all non-critical facilities, and all critical facilities and infrastructure in Ukiah is located within a severe shaking range (40 to 60 percent acceleration due to gravity). All critical facilities and infrastructure excluding bridges, rail, and highways are worth \$282,265,006. There is also 5.4 miles of highway (worth \$27,810,664), 5.3 miles of rail (worth \$7,397,523.4), and 10 bridges (worth \$14,324,680) located in this area. There are 4,327 residences (worth \$810,724,000), 104 nonresidential buildings (worth \$265,078,000), and approximately 15,497 people located in this severe shaking range also.

### *Flood*

According to the FIRM, last updated for Ukiah in August 1985, 0.2 mile of highway (worth \$1,039,651), 0.8 mile of railroad (worth \$1,122,096.2), two bridges (valued at \$2,864,936), the wastewater treatment plant (worth \$78,588,000), 1 rail facility (worth \$25,724,000), Oak Manor Elementary School (worth \$590,000), and 2 community facilities including the Oak Manor Park and the Ukiah Softball Complex (worth \$474,476) are within the 100-year floodplain. There are 601 residential buildings valued at \$97,273,000, 7 nonresidential buildings worth \$17,898,000, and approximately 2,241 people within the 100-year floodplain. Facilities, utilities, and other buildings within the 100-year floodplain have a 1 percent probability of occurrence in any given year and are considered to be at high risk of flooding.

A moderate risk is assigned to facilities, utilities, and other buildings within the 500-year floodplain. Within in this moderate risk area, there is 0.9 mile of highway (worth \$4,480,499), 0.8 mile of railroad (worth \$1,135,949.3), and 3 bridges (valued at \$4,297,404). There are also 202 residences (worth \$38,176,000), 4 nonresidential buildings (worth \$11,550,000), and approximately 800 people in an area with moderate risk to this hazard.

### *Hazardous Materials Event*

Using the National Response Center and the EPA's Environmental Facts Multisystem Query to locate hazardous waste handling facilities and businesses that generate hazardous waste from their activities, 15 critical facilities (worth \$24,991,054) are at risk for a hazardous material event within ¼ mile of transportation routes. There is also a considerable amount of critical infrastructure at risk located within ¼ mile of transportation routes including 4 utilities (worth \$88,824,000), 2 ground and air facilities (worth \$32,155,000), 9 bridges (worth \$12,892,212), 5.3 miles of rail (worth \$7,397,523.4), and 5.4 miles of highway (worth \$27,810,664). There are 1,883 residences valued at \$369,961,000, 89 nonresidential buildings worth 229,710,000, and approximately 8,417 people within this buffer zone as well.

The Ukiah Softball Complex (worth \$237,238) is the only critical facility at risk from a hazardous material event located within ¼ mile of EHS sites. Critical infrastructure located in this same radius includes 2 utilities (worth \$88,588,000), 1 bridge (worth \$1,432,468), 1.3 miles of rail (worth \$1,814,748.2), and 0.5 mile of highway (worth \$2,755,075). There are approximately 1,575 people living in 276 residences valued at \$66,401,000 within this buffer zone as well.

### *Landslide*

USGS elevation datasets were used to determine the risk of landslides in Ukiah. The slope inclination data assigns landslide potentials at 0 to 14 degrees (0 to 25 percent) (low), 14 to 32 degrees (25 to 65 percent) (medium), and 32 to 72 degrees (65 percent and above) (high). This analysis reveals that nearly 98 percent of the population (15,134) is situated in an area of low risk to this hazard with 4,153 residences (worth \$780,045,000) and 102 nonresidential buildings (worth \$256,635,000). Only 2 critical facilities are not within an area of low risk to this hazard. The total value of critical facilities including utilities, government, emergency response, educational, care, community, and ground and air facilities at low risk is \$281,557,006. There are also 5.4 miles of highway (worth \$27,810,664), 5.3 miles of rail (worth \$7,397,523.4), and 10 bridges (worth \$14,324,680).

The Woodlands Charter School (worth \$590,000) and KUKI Channel 277 (worth \$118,000) are located in a moderate landslide risk area. Also there are 140 residences valued at \$25,444,000, 2 nonresidential buildings worth \$6,900,000, and approximately 311 people in this moderate landslide risk area.

No critical facilities or infrastructure is located in an area of high landslide risk; however, approximately 16 people live in 7 residences (worth \$1,259,000) in areas of high risk to this hazard.

### *Tsunami*

A 10-foot maximum run-up area was used to categorize moderate risk to facilities, infrastructure, and other buildings based on NOAA models for maximum run-up future scenarios. There are no critical facilities and infrastructure or non-critical facilities at risk of tsunami impacts.

### *Urban Conflagration*

Intensity of development, determined by the percentage of impervious surfaces, determines the risk of urban conflagration. Impervious surfaces accounting for 20 to 49 percent of total cover is considered low developed density and facilities, infrastructure, and other buildings categorized as such are at low risk to this hazard. There are 7 critical facilities (worth \$4,406,816) including 2 community facilities and 5 educational facilities in an area of low risk to this hazard. Non-critical facilities in this area of low risk include 2,014 residences (worth \$378,673,000), 33 nonresidential buildings (worth \$74,911,000), and approximately 7,151 people.

Moderate developed density includes areas with impervious surfaces accounting for 50 to 79 percent of total cover and facilities, infrastructure, and other buildings categorized as such are at moderate risk to this hazard. The Civic Center (worth \$ 6,659,000), 3 emergency response facilities including the Ukiah Police and Fire Departments and the Ukiah valley Fire Protection District (worth \$3,068,000), 6 educational facilities including Nokomis Elementary, Yokayo Elementary, Zeek (Frank) Elementary, Calpella Elementary, Pomolita Middle School, and St. Mary of the Angels School (worth \$3,540,000), 3 utilities including the AT&T Central Switch Station, the Electric Substation, and the Hydro Generation Plant (worth \$139,918,000), 1 rail facility (worth \$25,724,000), 1 bridge (worth \$1,432,468), 1.2 miles of rail (worth \$1,690,070.9), and 2.1 miles of highway (worth \$11,020,301) are at moderate risk to urban conflagration. Non-critical facilities at moderate risk include 1,014 residences (worth \$192,402,000), 50 nonresidential facilities (worth \$124,772,000), and approximately 4,316 people.

Areas with a high risk to urban conflagration include high density areas with large numbers of people who reside and/or work in areas with impervious surfaces that account for 80 to 100 percent of total cover. There are 57 residences valued at \$8,840,000, 8 nonresidential buildings (worth \$24,282,000), and approximately 187 people in the high risk area for this hazard. Critical facilities and infrastructure at high risk to this hazard include two governmental facilities (worth \$2,360,000), River Oak Charter School (worth \$590,000), and Ukiah Valley Medical Center valued at \$8,260,000, 0.2 mile of highway (worth \$883,703), and 0.3 mile of railroad (worth \$401,738.2).

### *Wildland Fire*

Wildland fire hazard areas were identified for this plan by determining the amount of fuel in a given area. The wildland fire model takes into account slope, aspect, and fuel to determine the ranking. This model indicates that in the low risk area for wildland fire there are 2 educational facilities (worth \$1,180,000), 2 community facilities (worth \$474,476), a utility—Williams Communication Inc. (worth \$118,000), Ukiah Municipal Airport (worth \$6,431,000), 1.9 miles of highway (worth \$9,668,754), 1.4 miles of rail (worth \$1,980,984.7), and 2 bridges (worth \$2,864,936). There are also 94 residences (worth \$19,816,000), 7 nonresidential buildings (worth \$29,064,000), and an estimated population of 451 in the low risk area for this hazard.

Within the moderate-risk wildland fire area are 3 government facilities (worth \$9,019,000), 3 emergency response facilities (worth \$3,068,000), 12 educational facilities (worth \$7,080,000), 6 community facilities (worth \$2,168,530), the Ukiah Valley Medical Center (worth \$8,260,000), 6 utilities (worth \$218,742,000), Ukiah Municipal Airport (worth \$6,431,000), 8 bridges (worth \$11,459,744), 3.9 miles of rail (worth \$5,374,979.5), and 3.5 miles of highway (worth \$18,037,945). Nearly 95 percent of the population (14,659) lives in an area of moderate wildland

fire risk with 4,085 homes valued at \$763,630,000 and 96 nonresidential buildings worth \$230,151,000.

**Table K-6 City of Ukiah Legal and Regulatory Resources Available for Hazard Mitigation**

Regulatory Tool	Name		Effect on Hazard Mitigation
Plans	December 1995 (Revised in 2004) General Plan Growth Management Program Safety Element		Establishes policies that will minimize the potential of human injury and property damage to the following natural hazards: drainage; flood; seismic and other geologic hazards; and wild fires.
Programs	Disaster Preparedness Program		Coordinated through the Fire Department, to mitigate emergency incidents.
	National Flood Insurance Program (NFIP)		Makes affordable flood insurance available to homeowners, business owners, and renters in participating communities. In exchange, those communities must adopt and enforce minimum floodplain management regulations to reduce the risk of damage from future floods.
Policies (Municipal Code)	Division 3 Building	Chapter 1 Building Regulations	Adoption of Model Codes building codes as they are adopted, amended, or repealed of the Health and Safety Code and the appendices contained in the model codes including the Uniform Building Code, the Uniform Plumbing Code, and the Uniform Mechanical Code, as respectively adopted by the International Conference of Building Officials (ICBO), and the International Association of Plumbing and Mechanical Officials (IAPMO).
		Chapter 2 Earthquake Hazard Reduction in Existing Buildings	The purpose of this Chapter is to promote the public safety and welfare by reducing the risk of death or injury that may result from the effects of earthquakes on buildings with unreinforced masonry bearing walls. There is a substantial risk that such buildings may sustain life-hazardous damage during moderate to strong earthquakes.
	Division 6 Safety	Chapter 2 Emergency Services	The declared purposes of this Chapter are to provide for the preparation and carrying out of plans for the protection of persons and property within this City in the event of an emergency
		Chapter 3 Fire Prevention Code	This adoption includes all amendments made to the California Code of Regulations, as approved by the California building standards commission, and referred to as the California Fire Code.
		Chapter 4 Ambulance Service	The Department of Public Safety will develop protocols for dispatching police, fire, medical aid and ambulance service in response to 911 emergency aid calls that ensure the coordinated delivery of services. The Department shall develop protocols that ensure that the City Police Department responds first to emergency calls for police aid and the City Fire Department responds first to emergency calls for fire, medical aid and ambulance service.

**Table K-6 City of Ukiah Legal and Regulatory Resources Available for Hazard Mitigation**

Regulatory Tool	Name		Effect on Hazard Mitigation
		Chapter 6 Outdoor Burning	No person, firm, corporation, association, or public agency shall ignite, cause to be ignited, permit to be ignited, or suffer, allow, or maintain any open outdoor fire within the corporate limits of the City, unless except by the provisions of this Chapter.
	Division 9 Planning and Development	Chapter 6 Flood Plain Management	<p>The purpose of this Article is to promote the public health, safety and general welfare and to minimize public and private losses due to flood conditions in specific areas</p> <p>In order to accomplish its purposes, this ordinance includes methods and provisions for:</p> <p>A. Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards or which result in damaging increases in erosion or in flood heights or velocities;</p> <p>B. Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;</p> <p>C. Controlling the alteration of natural flood plains, stream channels and natural protective barriers, which help accommodate or channel flood waters;</p> <p>D. Controlling filling, grading, dredging and other development which may increase flood damage; and,</p> <p>E. Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.</p>

**Table K-7 City of Ukiah Administrative and Technical Resources for  
Hazard Mitigation**

<b>Staff/Personnel Resources</b>	<b>Department/Division Position</b>
Planner(s) or engineer(s) with knowledge of land development and land management practices	Planning and Community Development
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Public Works
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	Public Works
Floodplain manager	Public Works
Personnel skilled in GIS and/or HAZUS-MH	Planning and Community Development
Director of Emergency Services	Fire
Finance (grant writers, purchasing)	Finance
Public Information Officers	Various

**Table K-8 City of Ukiah Financial Resources for Hazard Mitigation**

<b>Financial Resources</b>	<b>Effect on Hazard Mitigation</b>
General funds	General funds may be used for hazard mitigation.
Authority to levy taxes for specific purposes	Unknown, information being located.
Incur debt through general obligation bonds	Unknown, information being located.
Incur debt through special tax and revenue bonds	Unknown, information being located.
Incur debt through private activity bonds	Unknown, information being located.
Hazard Mitigation Grant Program (HMGP)	FEMA funding which is available to local communities after a Presidentially-declared disaster. It can be used to fund both pre- and post-disaster mitigation plans and projects.
Pre-Disaster Mitigation (PDM) grant program	FEMA funding which available on an annual basis. This grant can only be used to fund pre-disaster mitigation plans and projects only.
Flood Mitigation Assistance (FMA) grant program	FEMA funding which is available on an annual basis. This grant can be used to mitigate repetitively flooded structures and infrastructure to protect repetitive flood structures.
United State Fire Administration (USFA) Grants	The purpose of these grants is to assist state, regional, national or local organizations to address fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors and firefighters.
Fire Mitigation Fees	Finance future fire protection facilities and fire capital expenditures required because of new development within Special Districts.

**Table K-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
2.A	Develop a sustained public outreach program that encourages consistent hazard mitigation content. For example, consider publishing tsunami inundation maps in telephone books, wildland fire defensible space tips with summer water bills or along highway billboards, and the safe handling and disposal of hazardous waste and chemicals with garbage bills.	High Priority	Planning and Community Development	HMGP or PDM funding	Ongoing	A sustained mitigation outreach program will help build and support countywide capacity to enable the public to prepare for, respond to, and recover from disasters.
4.A	Strengthen, abate, or downgrade in occupancy, any structures that are owned or leased by Mendocino County or incorporated communities that do not meet the California Building Code (CBC) requirements for seismic safety or the California Codes Essential Services	High Priority	Planning and Community Development	HMGP or PDM funding	5 years	As shown in the exposure analysis, a major earthquake poses the greatest risk of any hazard to Ukiah critical facilities. Mitigating structures that do not meet code would reduce the risk of exposure and help Ukiah respond to and recover from this hazard.

**Table K-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
	Building Act.					
5.F	Carry out minor flood and stormwater management projects that would reduce damage to infrastructure and residential buildings due to flooding. These projects include the modifying or replacing existing culverts and bridges, upgrading capacity of storm drains, stabilizing streambanks, clearing streambanks of debris and vegetation, and creating of debris or flood/stormwater retention basins in small watersheds.	High Priority	Public Works	HMGP, FMA or PDM funding	3 years	As noted above, flooding causes significant damage to City infrastructure every 3-4 years, during a large winter storm events. Mitigating infrastructure from flooding will reduce the short-term interval of damage to these facilities from these events. In addition, these projects are not atypical in urbanized areas prone to flooding and are generally technically feasible.
5.H	Retrofit wastewater and potable water facilities that subject to flooding. Retrofitting activities may include elevating vulnerable equipment, electrical controls, and other equipment, fastening and sealing manhole covers to prevent floodwater	High Priority	Public Works	HMGP or PDM funding	2-4 years	Several critical facilities, including WW and PW facilities were damaged throughout the county in Disaster 1628. This action will help ensure that the

**Table K-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
	infiltration, and protecting wells and other potable water from infiltration and flood damage by raising controls and well pipes.					community/critical facilities can operate in some capacity before, during, and after a future flood/winter storm event.

**Appendix L**  
**City of Willits**

**Table L-1A City of Willits Estimated Population and Building Inventory**

Population		Residential Buildings		Nonresidential Buildings	
2000 Census	Estimated 2005 Census	Total Building Count	Total Value of Buildings (\$)¹	Total Building Count	Total Value of Buildings (\$)²
5,073	5,066	1,398	233,881,000	23	79,303,000

Sources: FEMA HAZUS-MH, Version 2006, and U.S. Census 2000.

¹Average insured structural value of all residential buildings (including single-family dwellings, mobile homes, etc.) is \$167,000 per structure.

²Averaged insured structural value of all nonresidential buildings (including industry, trade, professional and technical services, etc.) is \$3,448,000.

**Table L-1B City of Willits Repetitive Loss Properties**

Type	Town	Occupancy	No. of Losses	Flood Insurance	Value (\$)¹	Total Claims (\$)²
RL	Willits	Nonresidential	2	No	160,870	35,315

Source: FEMA SQANet.

¹Insured structural value as of 9/30/2007.

²Content and building claims.

**Table L-2 City of Willits Critical Facilities and Infrastructure**

Facility Type	Name / Number	Address	Value¹
Emergency Response	Little Lake Fire Protection District	74 E. Commercial St.	708,000
	Willits Police Department	125 E. Commercial St., #150	1,652,000
	Brookstrails Fire Department	24860 Birch St.	708,000
Educational	Blosser Lane Elementary School	1275 Blosser Ln.	590,000
	Baechtel Grove Middle School	1150 Magnolia St.	590,000
	New Horizons School	371 E. Commercial St.	590,000
	Willits Community Day School	1150 Magnolia St.	590,000
	Willits Secondary Community Day School	371 Commercial St.	590,000
	Willits Charter School	7 S. Marin St.	590,000
	San Hedrin Continuation School	120 N. Main St.	590,000
	Willits High School	299 N. Main St.	590,000

**Table L-2 City of Willits Critical Facilities and Infrastructure**

<b>Facility Type</b>	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
	Brookside Elementary School	Spruce and Lincoln Wy.	590,000
	Sherwood Elementary School	32600 Sherwood Rd.	590,000
Care	Frank R. Howard Memorial Hospital	One Madrone St.	4,130,000
Community	Brookstrails Golf Course	24860 Birch St.	NA
	Recreation Grove Park	Commercial and South Lenore St.	237,238
	City Park	Across from City Hall	237,238
	Babcock Park	Hwy. 101	237,238
	Municipal Pool	429 N. Main St.	237,238
	Mendocino County Museum	400 E. Commercial St.	1,219,578
	Willits Senior Center	1501 Baechtel Rd.	237,238
State and Federal Highways	3.49 miles	---	18,141,910
Railroads	3.68 miles	---	5,028,654
Bridges	11 miles	---	15,757,148
Ground and Air Facilities	Rail Facility	Commercial St.	25,725,000
	Ellis Field-Willits Municipal		6,431,000
Utilities	KZYZ Channel 218	NA	118,000
	KLLK Channel 1250	NA	118,000
	KMKX Channel 228	NA	118,000
	Willits Water Quality Control Plant	300 N. Lenore Ave.	78,588,000
Dams	Centennial	---	NA
	Morris	---	NA

**Sources:** FEMA HAZUS-MH, local jurisdictions.

<sup>1</sup>Estimated and/or insured structural value for critical facilities and estimated values for critical infrastructure.

NA = Not Available.

**Table L-3 City of Willits Potential Hazard Exposure Analysis Overview – Population and Buildings**

			Population	Buildings			
Hazard Type	Hazard Area	Methodology		Number	Residential		Nonresidential
			Number		Value (\$) <sup>1</sup>	Number	Value (\$) <sup>1</sup>
Dam Failure	High	Inundation area	52	14	2,518,000	0	0
Earthquake	Very strong	20-40% (g)	0	0	0	0	0
	Severe	>40-60% (g)	0	0	0	0	0
	Violent	>60-80% (g)	5,073	1,398	233,881,000	23	79,303,000
Flood	Moderate	500-year floodplain	192	49	8,786,000	1	3,634,000
	High	100-year floodplain	640	141	24,880,000	1	5,338,000
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	4,288	1,150	192,358,000	21	73,080,000
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	135	38	7,989,000	0	0
Landslide	Low	0-14 degrees	5,073	1,390	232,623,000	23	75,799,000
	Moderate	>14-32 degrees	88	28	5,152,000	0	0
	High	>32-56 degrees	0	0	0	0	0
Tsunami	Moderate	10-foot maximum run-up area	0	0	0	0	0
Urban Conflagration	Low	Low developed density	2,893	771	126,437,000	15	48,398,000
	Moderate	Moderate developed density	265	84	12,665,000	3	8,803,000
	High	High developed density	49	19	3,158,000	0	0
Wildland Fire	Low	Low fuel rank	40	8	1,781,000	0	0
	Moderate	Moderate fuel rank	4,717	1,287	214,719,000	23	77,788,000
	High	High fuel rank	198	62	11,461,000	0	0
	Very high	Very high fuel rank	118	41	5,919,000	0	0

<sup>1</sup>Estimated and/or insured structural value.

Table L-4 City of Willits Potential Exposure Vulnerability Analysis Overview – Critical Facilities

Hazard Type	Hazard Area	Methodology	Government		Emergency Response		Educational		Care		Community	
			No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹
Dam Failure	High	Inundation area	0	0	1	708,000	0	0	0	0	1	0
Earthquake	Very strong	20-40% (g)	0	0	0	0	0	0	0	0	0	0
	Severe	>40-60% (g)	0	0	0	0	1	590,000	0	0	0	0
	Violent	>60-80% (g)	0	0	3	3,068,000	9	5,310,000	1	4,130,000	7	2,405,768
Flood	Moderate	500-year floodplain	0	0	0	0	0	0	0	0	0	0
	High	100-year floodplain	0	0	0	0	2	1,180,000	0	0	1	237,238
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	0	0	2	2,360,000	8	4,720,000	1	4,130,000	6	2,405,768
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	0	0	0	0	1	590,000	0	0	1	237,238
Landslide	Low	0-14 degrees	0	0	3	3,068,000	10	5,900,000	1	4,130,000	7	2,405,768
	Moderate	>14 - 32 degrees	0	0	0	0	0	0	0	0	0	0
	High	>32 - 56 degrees	0	0	0	0	0	0	0	0	0	0
Tsunami	Moderate	10-foot maximum run-up area	0	0	0	0	0	0	0	0	0	0
Urban Conflagration	Low	Low developed density	0	0	2	2,360,000	5	2,950,000	1	4,130,000	5	2,168,530
	Moderate	Moderate developed density	0	0	0	0	2	1,180,000	0	0	0	0
	High	High developed density	0	0	0	0	0	0	0	0	0	0
Wildland Fire	Low	Low fuel rank	0	0	0	0	0	0	0	0	0	0
	Moderate	Moderate fuel rank	0	0	2	2,360,000	10	5,900,000	1	4,130,000	6	2,405,768
	High	High fuel rank	0	0	1	708,000	0	0	0	0	1	0
	Very high	Very high fuel rank	0	0	0	0	0	0	0	0	0	0

¹Estimated and/or insured structural value.

Table L-5 City of Willits Potential Hazard Exposure Analysis Overview – Critical Infrastructure

Hazard Type	Hazard Area	Methodology	Highways		Railroads		Bridges		G&A Facilities		Utilities		Dams	
			Miles	Value (\$)¹	Miles	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹
Dam Failure	High	Inundation area	0.0	0	0.0	0	1	1,432,468	0	0	2	78,706,000	1	NA
Earthquake	Very strong	20-40% (g)	0.0	0	0.0	0	0	0	0	0	0	0	0	NA
	Severe	>40-60% (g)	0.0	0	0.0	0	0	0	0	0	2	236,000	0	NA
	Violent	>60-80% (g)	3.5	18,141,910	6.6	9,184,566	11	15,757,148	2	32,156,000	2	78,706,000	2	NA
Flood	Moderate	500-year floodplain	0.0	51,983	0.8	1,108,243	0	0	0	0	0	0	0	NA
	High	100-year floodplain	0.1	259,913	0.9	1,177,508	3	4,297,404	0	0	1	78,588,000	0	NA
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	3.5	18,141,910	6.6	9,184,566	8	11,459,744	1	25,725,000	0	0	0	NA
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	0.5	2,651,110	0.0	0	0	0	0	0	1	78,588,000	0	NA
Landslide	Low	0-14 degrees	3.5	18,141,910	6.6	9,184,566	11	15,757,148	2	32,156,000	3	78,824,000	1	NA
	Moderate	>14-32 degrees	0.0	0	0.0	0	0	0	0	0	1	118,000	1	NA
	High	>32-56 degrees	0.0	0	0.0	0	0	0	0	0	0	0	0	NA
Tsunami	Moderate	10-foot maximum run-up area	0.0	0	0.0	0	0	0	0	0	0	0	0	NA
Urban Conflagration	Low	Low developed density	2.4	12,579,777	1.7	2,382,723	6	8,594,808	0	0	1	78,588,000	0	NA
	Moderate	Moderate developed density	0.3	1,663,442	0.3	360,179	1	1,432,468	0	0	0	0	0	NA
	High	High developed density	0.0	0	0.8	1,163,655	0	0	1	25,725,000	0	0	0	NA
Wildland Fire	Low	Low fuel rank	0.1	675,773	0.9	1,274,480	1	1,432,468	0	0	1	18,000	1	NA
	Moderate	Moderate fuel rank	3.3	17,310,189	5.7	7,910,086	10	14,324,680	2	32,156,000	2	78,706,000	1	NA
	High	High fuel rank	0.0	103,965	0.0	0	0	0	0	0	1	118,000	0	NA
	Very high	Very high fuel rank	0.0	0	0.0	0	0	0	0	0	0	0	0	NA

¹Estimated value.

### *Dam Failure*

The State of California regulates and inventories dams measuring greater than 25 feet in height and retaining greater than 15 acre-feet of water or those dams that are more than 6 feet in height and retaining greater than 50 acre-feet of water. Inundation maps were developed for larger dams. Critical facilities, infrastructure, and other buildings within the inundation area are considered to be in high hazard area in the event of dam failure.

There are 14 residential structures (worth \$2,518,000) and an estimated population of 52 people within the inundation area. Critical facilities within the inundation area include the Brooktrails Golf Course (value unknown), Brooktrails Fire Department (worth \$708,000), KLLK 1250 (worth \$118,000), Willits Water Quality Control Plant (worth \$78,588,000), and 1 bridge (worth \$1,432,468). The Morris Dam (value unavailable), a constant radius arch dam constructed in 1927, has a high risk of failure.

### *Earthquake*

PGA shake maps produced by the USGS show that no critical facilities, infrastructure, or non-critical facilities fall within a very strong shaking range (20 to 40 percent acceleration due to gravity). Three critical facilities are within a severe shaking range (40 to 60 percent acceleration due to gravity), including Sherwood Elementary School (worth \$590,000), and KZYZ Channel 218 and KMKX Channel 228 (each worth \$118,000).

The entire population of Willits is located within a violent shaking range (60 to 80 percent acceleration due to gravity) including 1,398 residences (worth \$233,881,000), 23 nonresidential buildings (worth \$79,303,000), and an estimated population of 5,073 people. In addition, all of the critical facilities and infrastructure, including 3 emergency response facilities (worth \$3,068,000), 9 educational facilities (worth \$5.31 million), 7 community facilities (worth \$2,405,768), the Frank R. Howard Memorial Hospital (worth \$4,130,000), 2 dams (value unknown), 2 utilities (worth \$78,706,000), 2 ground and air facilities (worth \$32,156,000), 11 bridges (worth \$15,757,148), 6.6 miles of rail (worth \$9,184,566), and 3.5 miles of highway (worth \$18,141,910).

### *Flood*

According to the FIRM, last updated for Willits in September 1988, 2 educational facilities (worth \$1,180,000), Recreation Groves Park (worth \$2,405,768), the Water Quality Control Plant (valued at \$78,588,000), 3 bridges (worth \$4,297,404), 0.9 mile of rail (worth \$1,177,508), and 0.1 miles of highway (worth \$259,913) are within the 100-year floodplain. There are 141 residential buildings (worth \$24,880,000), 1 nonresidential building (worth \$5,338,000), and an estimated population of 640 people within the 100-year floodplain. Facilities, utilities, infrastructure, and other buildings within the 100-year floodplain have a 1 percent probability of occurrence in any given year and are considered to be at high risk of flooding.

A moderate risk is assigned to facilities, utilities, and other buildings within the 500-year floodplain. The City of Willits has less than 0.1 mile of highway (worth \$51,983) and 0.8 mile of rail (worth \$1,108,243). In addition, there are 49 residential structures (worth \$8,786,000), 1

nonresidential building (worth \$3,634,000), and an estimated population of 192 people located in this moderate risk area.

There is 1 nonresidential RL property located in Willits with an estimated structural value of \$160,870. There is no flood insurance covering this property. The property has recorded two losses as a result of flooding from the Mill Creek and Broaddus Creek, with a total of \$35,315 in claims (including contents).

### ***Hazardous Materials Event***

Using the National Response Center and the EPA's Environmental Facts Multisystem Query to locate hazardous waste handling facilities and businesses that generate hazardous waste from their activities, we are able to determine that approximately 85 percent of the population (4,288 people) resides within ¼ mile of transportation routes in the City of Willits putting them at risk to exposure of a hazardous materials event. There are 18 critical facilities (worth \$39,340,768), 3.5 miles of highway (worth \$18,141,910), 6.6 miles of rail (worth \$9,184,566), and 8 bridges (worth \$11,459,744) at risk from a hazardous materials event within this buffer zone as well.

The Municipal Pool (worth \$237,238), Willits High School (worth \$590,000), the Water Quality Control Plant (worth 78,588,000), and 0.5 mile of highway (worth \$2,651,110) are located within ¼ mile of EHS sites. There are 38 residences valued at \$7,989,000 and an estimated population of 135 people within this buffer zone as well.

### ***Landslide***

USGS elevation datasets were used to determine the risk of landslides in Willits. The slope inclination data assigns landslide potentials at 0 to 14 degrees (0 to 25 percent) (low), 14 to 32 degrees (25 to 65 percent) (medium), and 32 to 72 degrees (65 percent and above) (high). This analysis reveals approximately 5,073 people are situated in an area of low risk to this hazard with 1,390 residences (worth \$232,623,000) and 20 nonresidential buildings (worth \$75,799,000). Only 2 critical facilities are not located within an area of low risk to this hazard. The total value of critical facilities including utilities, government, emergency response, educational, care, community, and ground and air facilities at low risk is \$126,483,768. There are also 3.5 miles of highway (worth \$18,141,910), 6.6 miles of rail (worth \$9,184,566), 11 bridges (worth \$15,757,148), and the Morris Dam (value unknown).

KZYZ Channel 218 (worth \$118,000), the Morris Dam (worth \$118,000), 28 residences valued at \$5,152,000, and an estimated population of 88 people are located in a moderate landslide risk area.

No critical facilities, infrastructure, or non-critical facilities are located in an area of high landslide risk.

### ***Tsunami***

A 10-foot maximum run-up area was used to categorize moderate risk to facilities, infrastructure, and other buildings based on NOAA models for maximum run-up future scenarios. There are no critical facilities, infrastructure, non-critical facilities, or people living in residences at risk of tsunami impacts.

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### *Urban Conflagration*

Intensity of development, determined by the percentage of impervious surfaces, determines the risk of urban conflagration. Impervious surfaces accounting for 20 to 49 percent of total cover is considered low developed density and facilities, infrastructure, and other buildings categorized as such are at low risk to this hazard. There are 14 critical facilities (worth \$90,196,530) including 5 community facilities, 5 educational facilities, 2 emergency response facilities, the Wastewater Control Plant, and the Frank R. Howard Memorial Hospital in an area of low risk to this hazard. Critical infrastructure includes 2.4 miles of highway (worth \$12,579,777), 1.7 miles of rail (worth \$2,382,723), and 6 bridges (worth \$8,594,808). Non-critical facilities in this area of low risk include 771 residences (worth \$126,437,000), 15 nonresidential buildings (worth \$48,398,000), and an estimated population of 2,893 people.

Moderate developed density includes areas with impervious surfaces accounting for 50 to 79 percent of total cover and facilities, infrastructure, and other buildings categorized as such are at moderate risk to this hazard. The Brookside Elementary School and the Willits Community Day Schools (worth \$1,180,000), 1 bridge (worth \$1,432,468), 0.3 miles of rail (worth \$360,179), and 0.3 mile of highway (worth \$1,663,442) are at moderate risk to urban conflagration. Non-critical facilities within the moderate risk area include 84 residences (worth \$12,665,000), 3 nonresidential facilities (worth \$8,803,000), and an estimated population of 265 people.

Areas with high risk to urban conflagration include high density areas with large numbers of people who reside and/or work in areas with impervious surfaces that account for 80 to 100 percent of total cover. There are 19 residences valued at \$3,158,000, as well as 0.8 mile of rail (worth \$1,163,655), the city's rail facility (worth \$25,725,000), and an estimated 49 people located in areas at high risk to this hazard.

### *Wildland Fire*

Wildland fire hazard areas were identified for this plan by determining the amount of fuel in a given area. The wildland fire model takes into account slope, aspect, and fuel to determine the ranking. This model indicates that in the low risk area for wildland fire there are 0.1 mile of highway (worth \$675,773), 0.9 miles of rail (worth \$1,274,480), 1 bridge (worth \$1,432,468), and the Centennial Dam (value unknown). There are also 8 residences (worth \$1,781,000 with an estimated population of 40 people in the low risk area for this hazard.

Over 90 percent of the population (4,717 people) is located in areas of moderate risk with 1,287 residences valued at \$214,719,000 and 23 nonresidential buildings worth \$77,788,000. There are 24 critical facilities including 2 emergency response facilities (worth \$2,360,000), 10 educational facilities (worth \$5,900,000), the Frank R Howard memorial Hospital (worth 4,130,000), 6 community facilities (worth \$2,405,768), 2 utilities (worth \$78,706,000), and 2 ground and air facilities (worth \$32,156,000), 10 bridges (worth \$14,323,680), 5.7 miles of rail (worth \$7,910,086), 3.3 miles of highway (worth \$17,310,189), and the Morris Dam (value unknown).

In areas with high risk to wildland fire, there are 62 residences (worth \$11,461,000) with an estimated population of 198 people. There is less than 0.1 mile of highway (worth \$103,965), KMKX Channel 228 (worth \$118,000), Brooktrails Fire Department (worth \$708,000), and the Brooktrails Golf Course (value unknown) located within areas of high risk to wildland fire.

Within the very high-risk wildland fire area there are no critical facilities or infrastructure; however, there are 41 homes with a value of \$5,919,000 and an estimated population of 118 people.

**Table L-6 City of Willits Legal and Regulatory Resources Available for Hazard Mitigation**

<b>Regulatory Tool</b>	<b>Name</b>	<b>Effect on Hazard Mitigation</b>
Plans	General Plan Safety Element	The underlying assumption of this element is that the City can reduce the hazards caused by certain natural occurrences if the probabilities of such conditions are known in advance and plans for dealing with them are prepared. State law requires that the Safety Element address the protection of the community from unreasonable risks associated with the effects of natural hazards.
	Emergency Preparedness Plan	Provides easy steps, regardless of the nature of the potential emergency or disaster, you can take to prepare for possible disruptions.
Programs	National Flood Insurance Program (NFIP)	Makes affordable flood insurance available to homeowners, business owners, and renters in participating communities. In exchange, those communities must adopt and enforce minimum floodplain management regulations to reduce the risk of damage from future floods.

**Table L-7 City of Willits Administrative and Technical Resources for Hazard Mitigation**

<b>Staff/Personnel Resources</b>	<b>Department/Division Position</b>
Planner(s) or engineer(s) with knowledge of land development and land management practices	Community Development
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	Public Works
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	Public Works
Floodplain manager	Public Works
Personnel skilled in GIS and/or HAZUS-MH	Community Development
Director of Emergency Services	Police
Finance (grant writers, purchasing)	Finance
Public Information Officers	Various

**Table L-8 City of Willits Financial Resources for Hazard Mitigation**

<b>Financial Resources</b>	<b>Effect on Hazard Mitigation</b>
General funds	Information not available.
Authority to levy taxes for specific purposes	Information not available.
Incur debt through general obligation bonds	Information not available.
Incur debt through special tax and revenue bonds	Information not available.
Incur debt through private activity bonds	Information not available.
Hazard Mitigation Grant Program (HMGP)	FEMA funding which is available to local communities after a Presidentially-declared disaster. It can be used to fund both pre- and post-disaster mitigation plans and projects.
Pre-Disaster Mitigation (PDM) grant program	FEMA funding which available on an annual basis. This grant can only be used to fund pre-disaster mitigation plans and projects only.
Flood Mitigation Assistance (FMA) grant program	FEMA funding which is available on an annual basis. This grant can be used to mitigate repetitively flooded structures and infrastructure to protect repetitive flood structures.
United State Fire Administration (USFA) Grants	The purpose of these grants is to assist state, regional, national or local organizations to address fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors and firefighters.
Fire Mitigation Fees	Finance future fire protection facilities and fire capital expenditures required because of new development within Special Districts.

**Table L-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
2.A	Develop a sustained public outreach program that encourages consistent hazard mitigation content. For example, consider publishing tsunami inundation maps in telephone books, wildland fire defensible space tips with summer water bills or along highway billboards, and the safe handling and disposal of hazardous waste and chemicals with garbage bills.	High Priority	Community Development	HMGP or PDM funding	Ongoing	A sustained mitigation outreach program will help build and support countywide capacity to enable the public to prepare for, respond to, and recover from disasters.
4.A	Strengthen, abate, or downgrade in occupancy, any structures that are owned or leased by Mendocino County or incorporated communities that do not meet the California Building Code (CBC) requirements for seismic safety or the California Codes	High Priority	Community Development	HMGP or PDM funding	5 years	As shown in the exposure analysis, a major earthquake poses the greatest risk of any hazard to Ukiah critical facilities. Mitigating structures that do not meet code would reduce the risk of exposure and help Ukiah respond to and recover from this hazard.

**Table L-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
	Essential Services Building Act.					
4.B	Develop a voluntary building inspection program in which homes and/or businesses are inspected by a building official for weak or poorly anchored parapets, signs, glass, machinery, shelving, fixtures, and other nonstructural elements or architectural detailing that might cause injury if they were to fall or break during an earthquake.	High Priority	Community Development	HMGP or PDM funding	1-2 years	This action will prevent future residential and nonresidential losses of unreinforced masonry buildings in the future. The retrofitting of unreinforced masonry buildings is a high priority for the State of California.
5.A	Explore mitigation opportunities, including acquisition, relocation, and elevation, for the three repetitively flooded properties throughout the county (1 RL property in Willits).	High Priority	Public Works	FMA funding	2-3 years	The mitigation of repetitively flooded properties is a priority for FEMA grant programs. Technical feasibility to mitigate a RL property will be determined by a County engineer. In addition, a County engineer or the NFIP coordinator will determine the mitigation RL project's BCA using

**Table L-9 Mitigation Action Plan Matrix**

<b>Action Number</b>	<b>Description</b>	<b>Ranking/Prioritization</b>	<b>Administering Department</b>	<b>Potential Funding</b>	<b>Timeframe</b>	<b>Benefit-Costs / Technical Feasibility</b>
						FEMA-approved BCA software and methodologies.
5.B	Continue to participate in the NFIP program by enforcing the floodplain management ordinance to reduce future flood damage. In addition, join the Community Rating System (CRS) program. A community that participates in additional floodplain management activities, such as those outlined in the CRS program, will reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance.	High Priority	Public Works	General funds	Ongoing, 1-2 years for CRS program	The City already participates in the NFIP and is very knowledgeable about floodplain management. Additional technically-feasible floodplain management activities to consider may include mitigation, outreach, and educational activities that go well beyond minimum NFIP requirements.

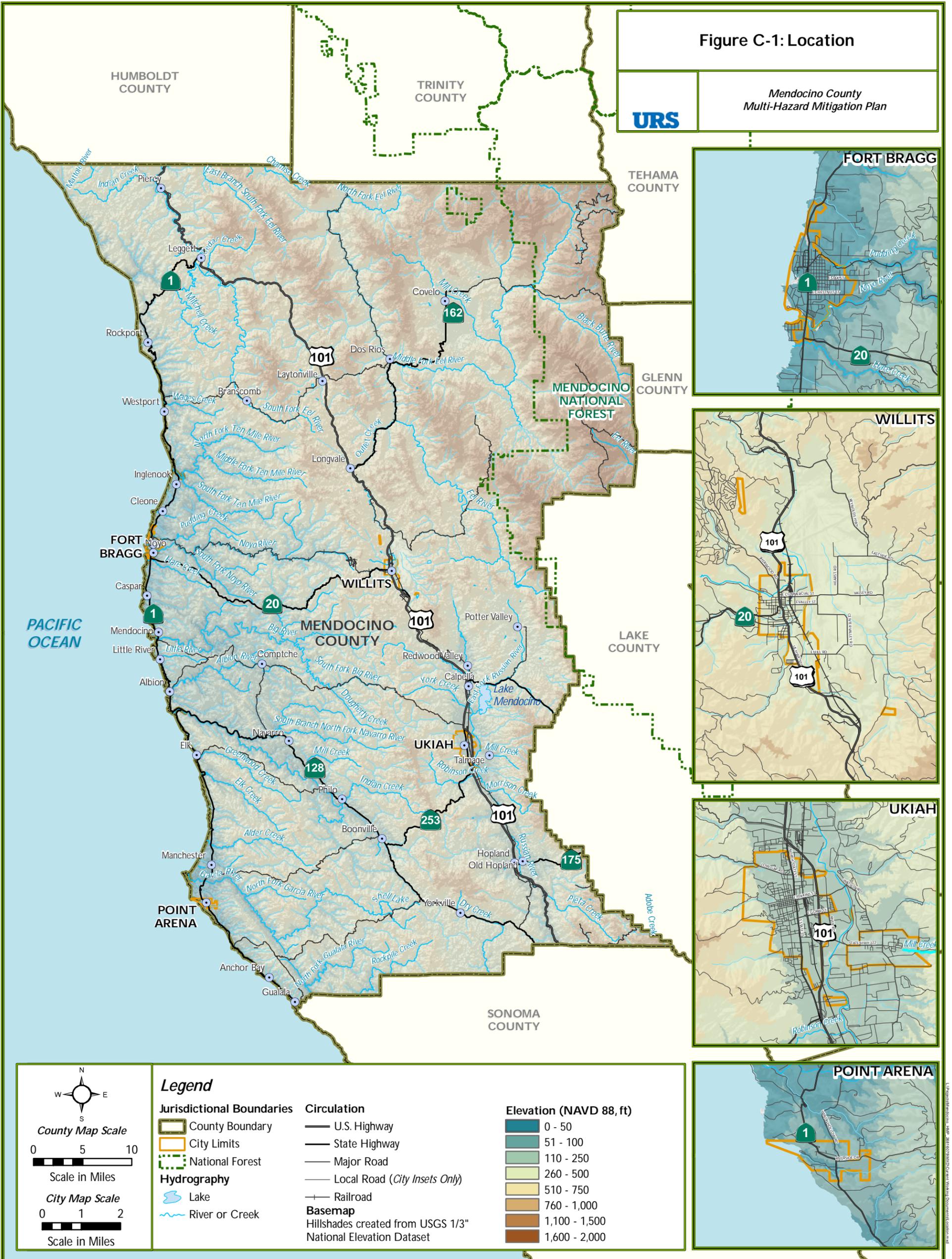
**Appendix M**  
**Electronic Files**



Figure C-1: Location

URS

Mendocino County  
Multi-Hazard Mitigation Plan

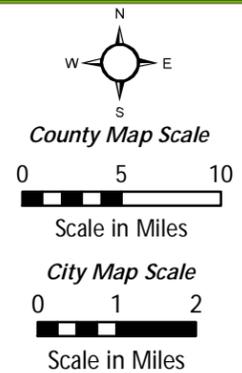
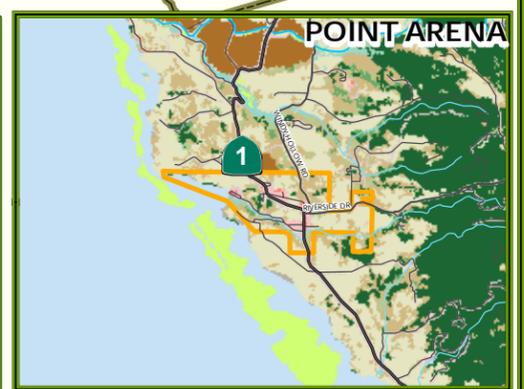
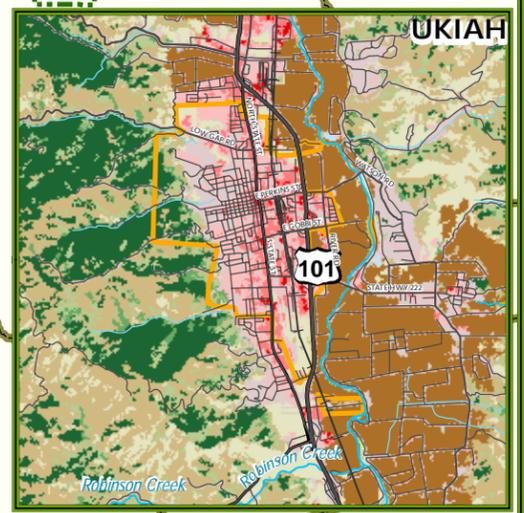
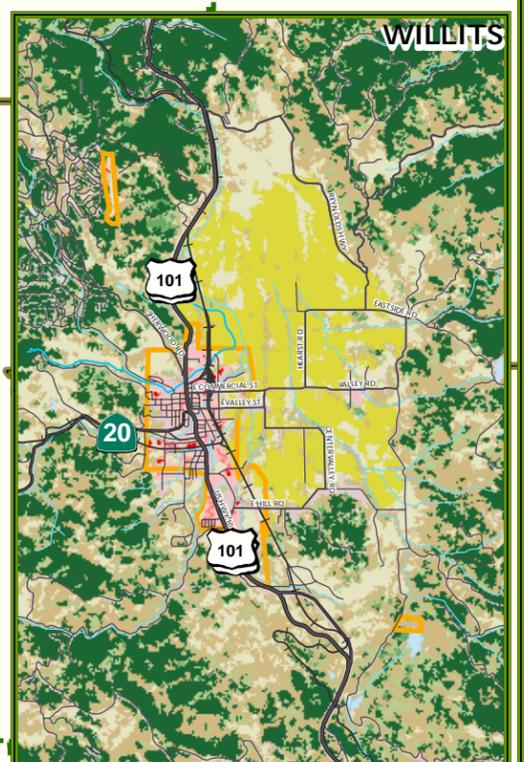


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Figure C-2: Land Cover



Mendocino County  
Multi-Hazard Mitigation Plan



**Legend**

- Jurisdictional Boundaries**
- County Boundary
  - City Limits
  - National Forest
- Hydrography**
- Lake
  - River or Creek

- Circulation**
- U.S. Highway
  - State Highway
  - Major Road
  - Local Road (City Insets Only)
  - Railroad
- Basemap**
- Hillshades created from USGS 1/3" National Elevation Dataset

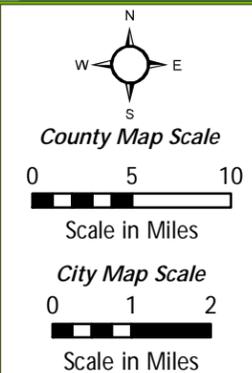
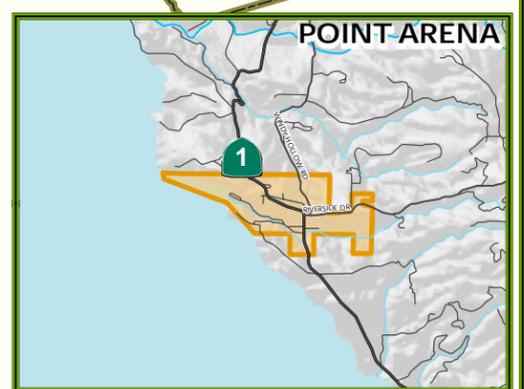
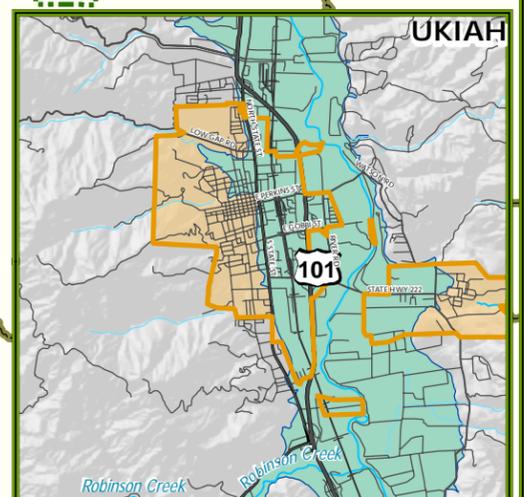
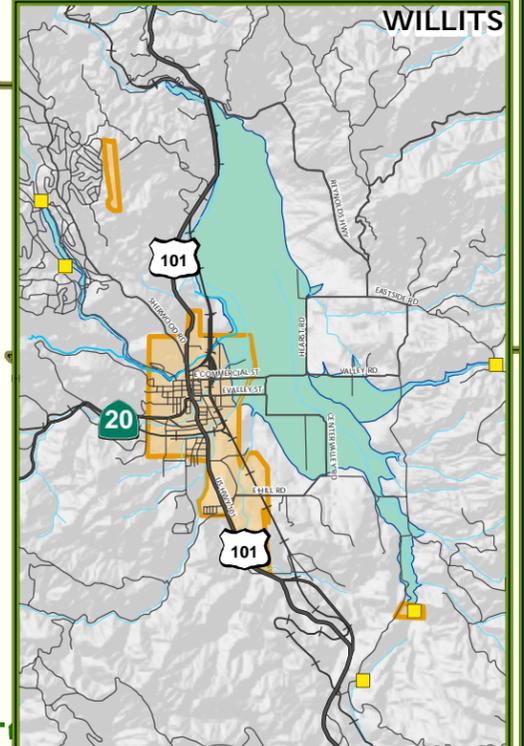
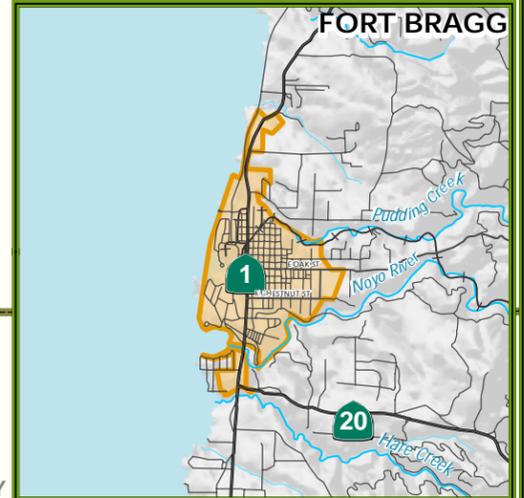
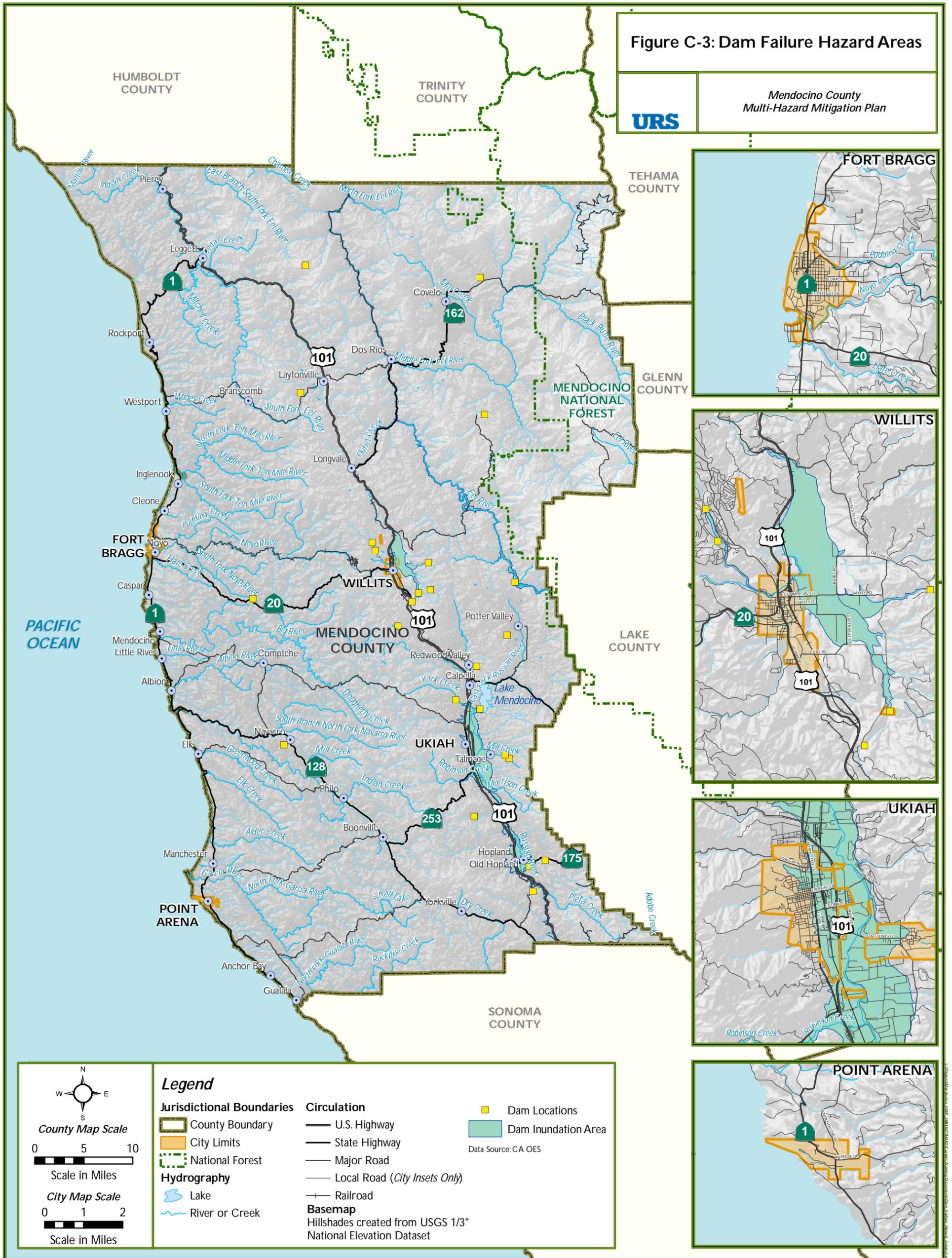
- Land Cover**
- |                  |                              |
|------------------|------------------------------|
| Evergreen Forest | Herbaceous                   |
| Deciduous Forest | Emergent Herbaceous Wetlands |
| Mixed Forest     | Developed, High Intensity    |
| Woody Wetlands   | Developed, Medium Intensity  |
| Shrub/Scrub      | Developed, Low Intensity     |
| Hay/Pasture      | Developed, Open Space        |
| Cultivated Crops | Barren Land                  |
| Open Water       | Data Source: NLCD            |

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Figure C-3: Dam Failure Hazard Areas



Mendocino County  
Multi-Hazard Mitigation Plan



Legend	
<b>Jurisdictional Boundaries</b>	<b>Circulation</b>
County Boundary	U.S. Highway
City Limits	State Highway
National Forest	Major Road
<b>Hydrography</b>	Local Road (City Insets Only)
Lake	Railroad
River or Creek	<b>Basemap</b>
Dam Locations	Hillshades created from USGS 1/3" National Elevation Dataset
Dam Inundation Area	

Data Source: CA OES

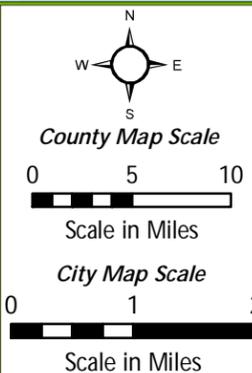
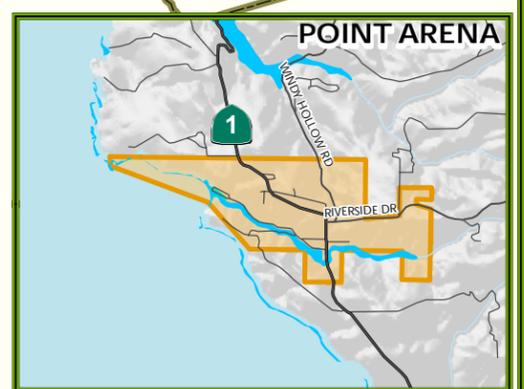
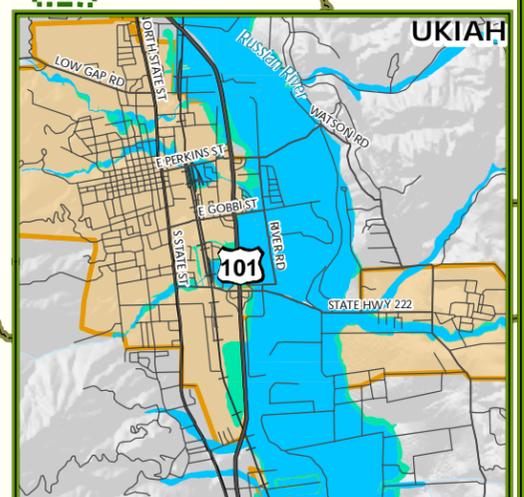
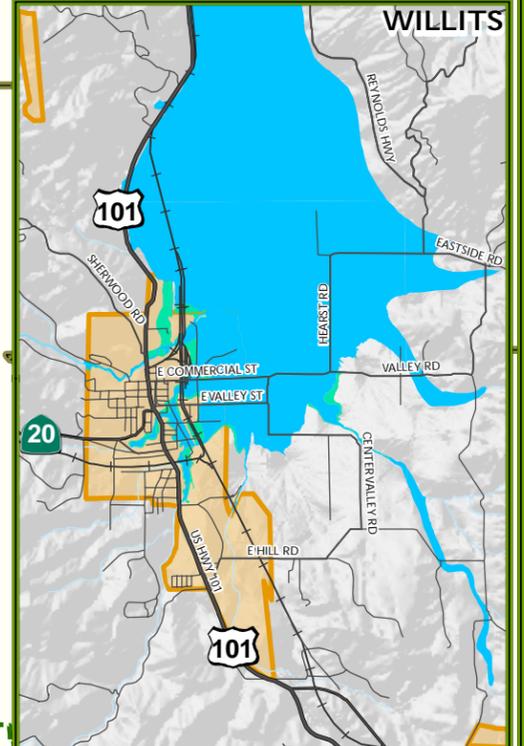
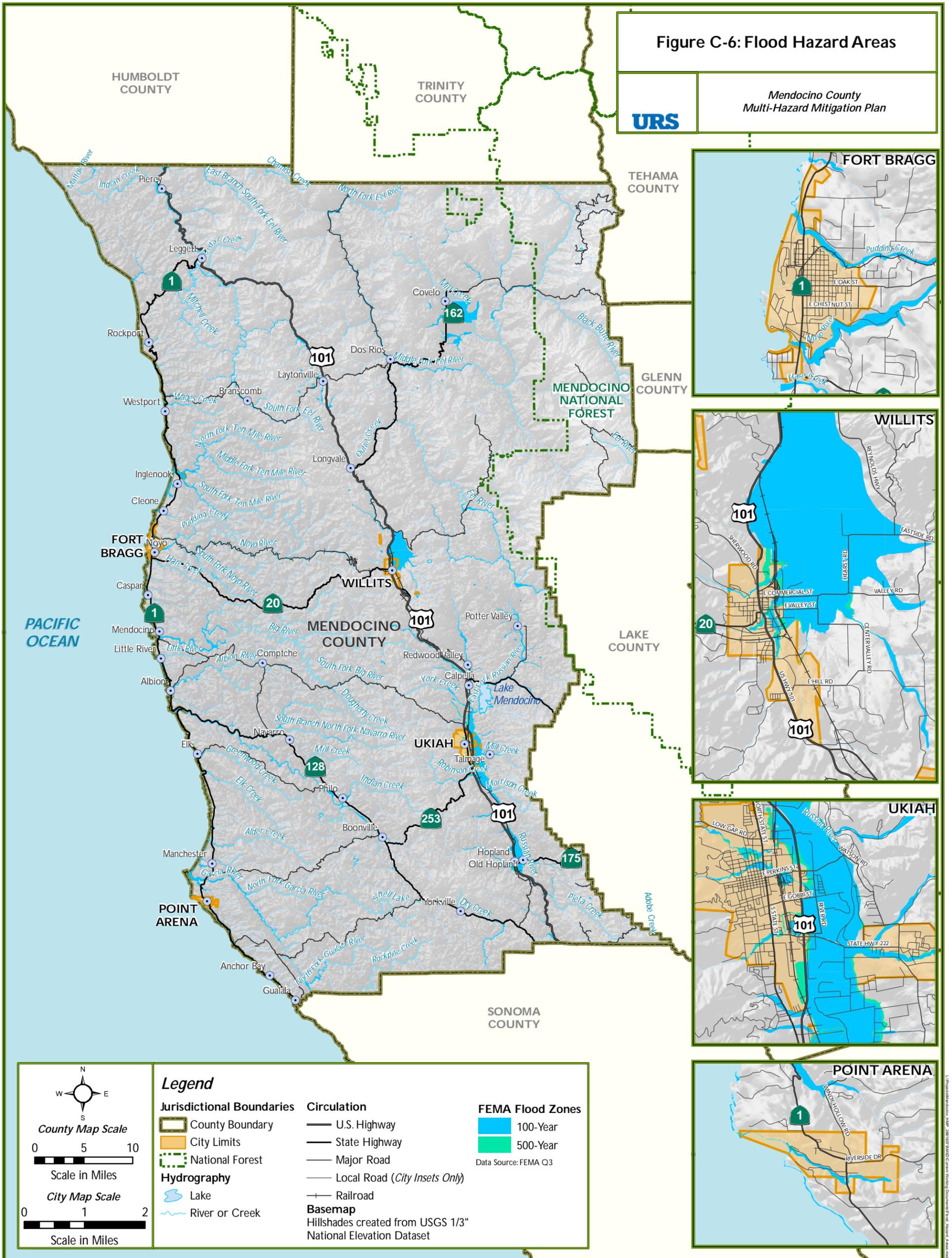




Figure C-6: Flood Hazard Areas

URS

Mendocino County  
Multi-Hazard Mitigation Plan



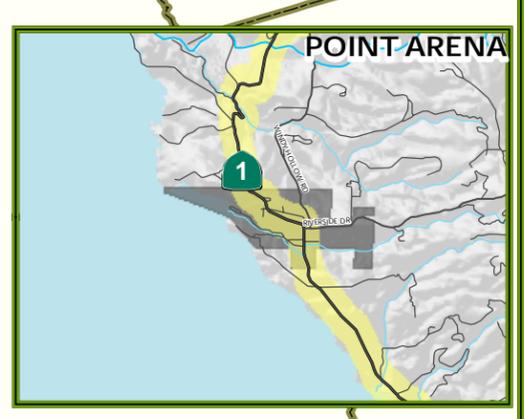
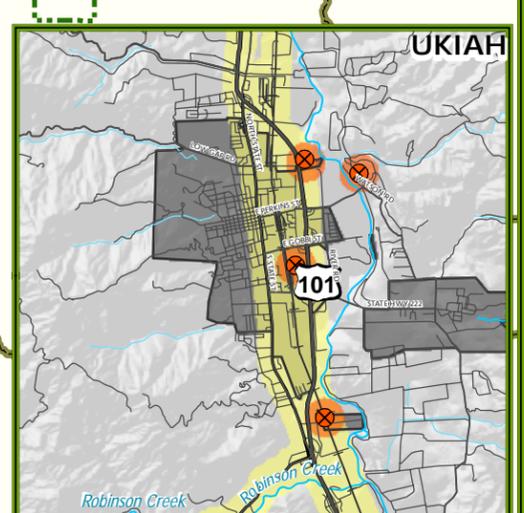
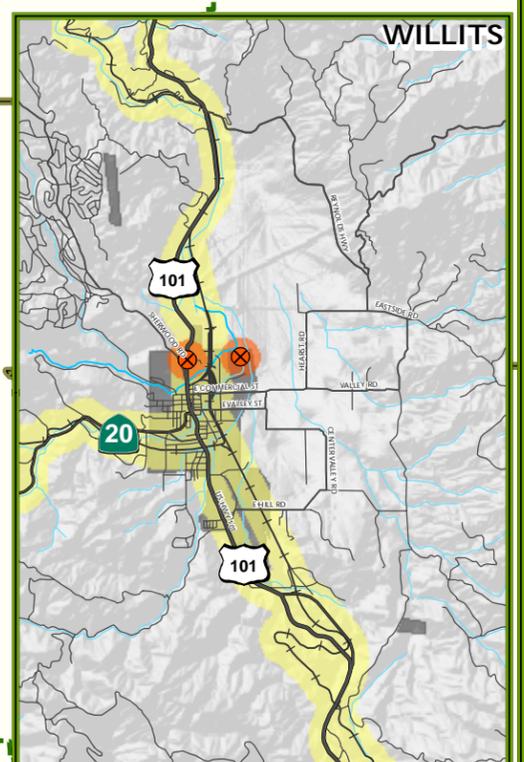
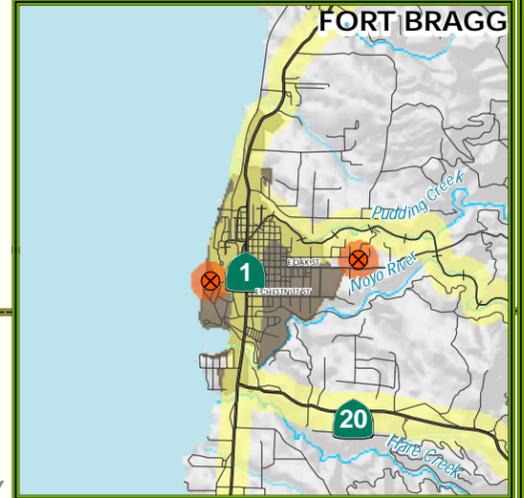
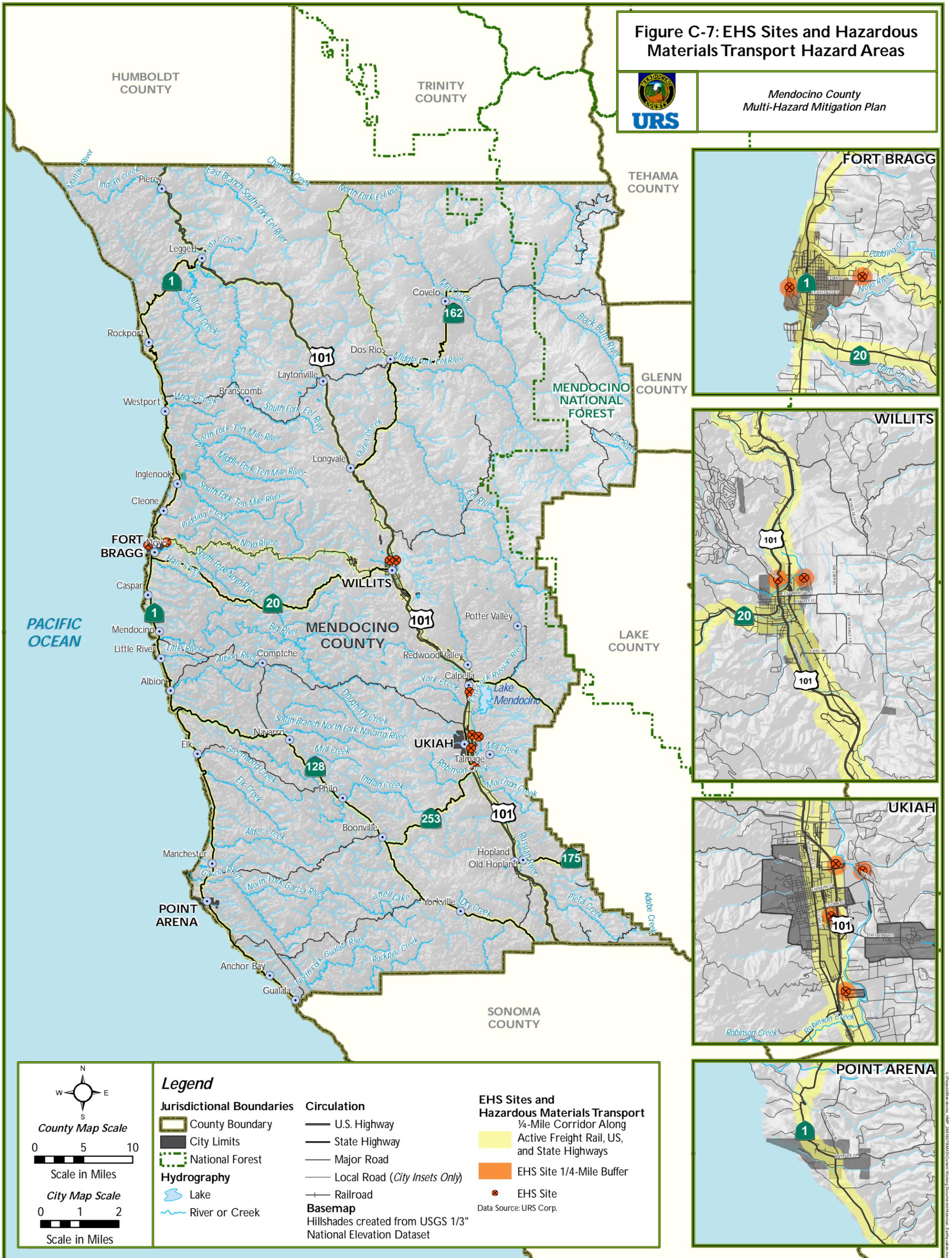
Legend		Circulation		FEMA Flood Zones	
	County Boundary		U.S. Highway		100-Year
	City Limits		State Highway		500-Year
	National Forest		Major Road	Data Source: FEMA Q3	
	Lake		Local Road (City Insets Only)		
	River or Creek		Railroad		
		<b>Basemap</b>			
		Hillshades created from USGS 1/3" National Elevation Dataset			

Map data by URS, FEMA, USGS, and other sources. All rights reserved.

**Figure C-7: EHS Sites and Hazardous Materials Transport Hazard Areas**



Mendocino County  
Multi-Hazard Mitigation Plan

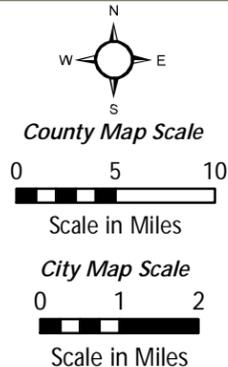
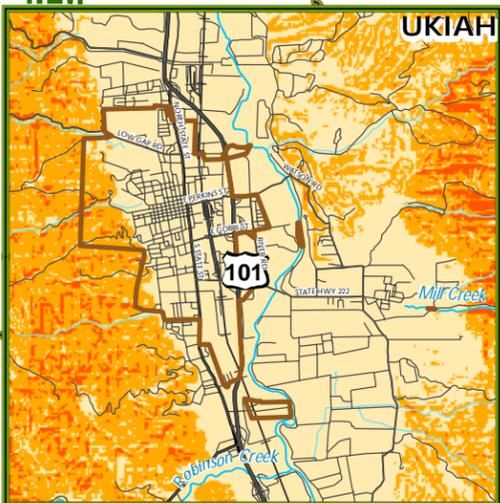
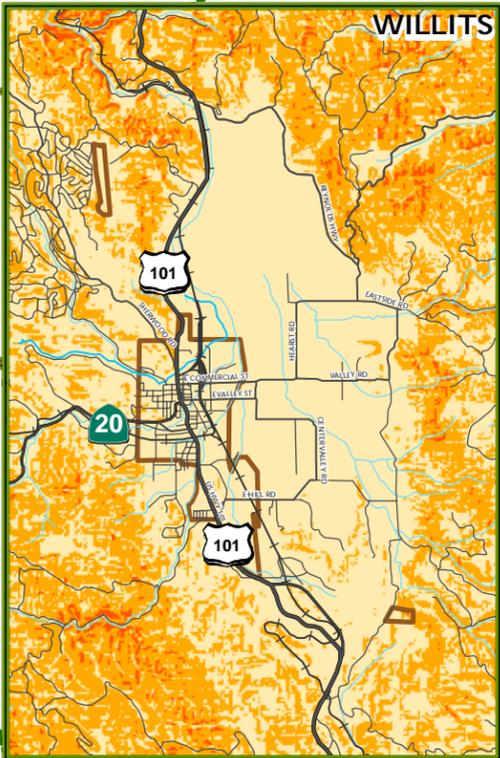


U.S. Department of Transportation, Federal Highway Administration, 2015 National Inventory of Roadway Inventory Data, EHS Sites, 2015

Figure C-8: Landslide Hazard Areas



Mendocino County  
Multi-Hazard Mitigation Plan



**Legend**

**Jurisdictional Boundaries**

- County Boundary
- City Limits
- National Forest

**Hydrography**

- Lake
- River or Creek

**Circulation**

- U.S. Highway
- State Highway
- Major Road
- Local Road (*City Insets Only*)
- Railroad

**Basemap**

Slope created from USGS 1/3" National Elevation Dataset

**Landslide Hazard (Slope)**

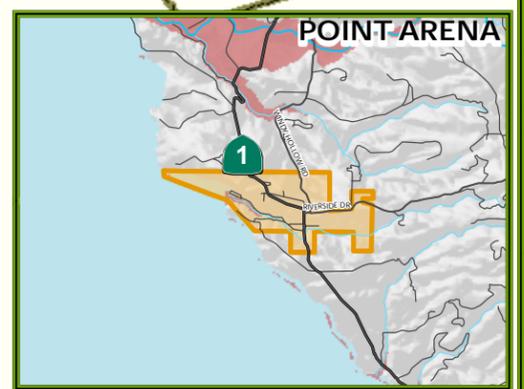
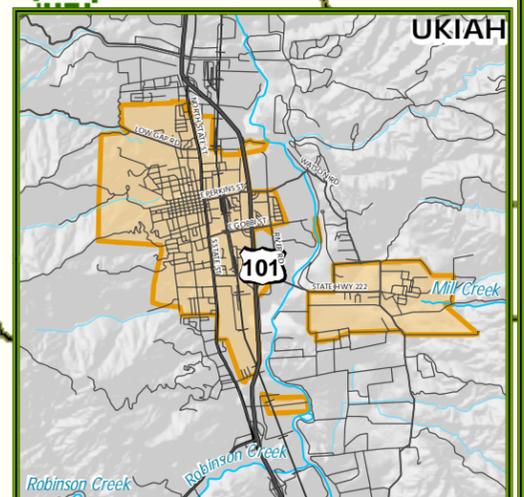
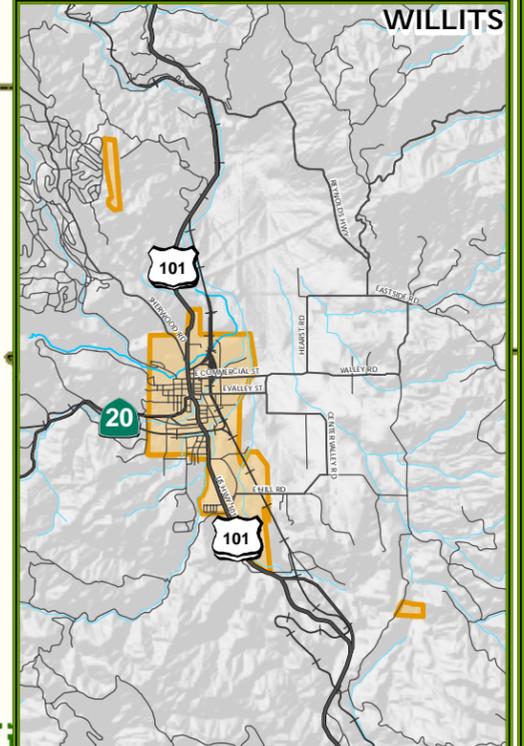
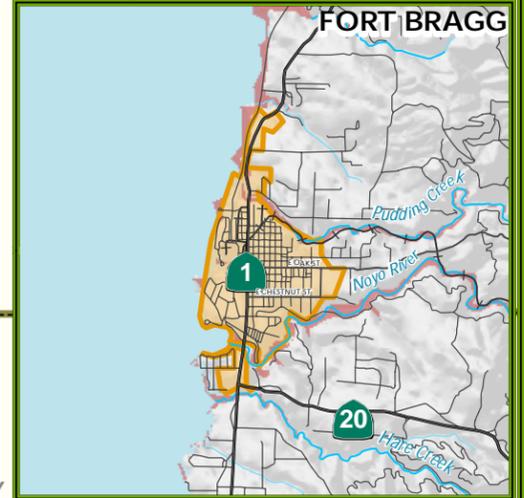
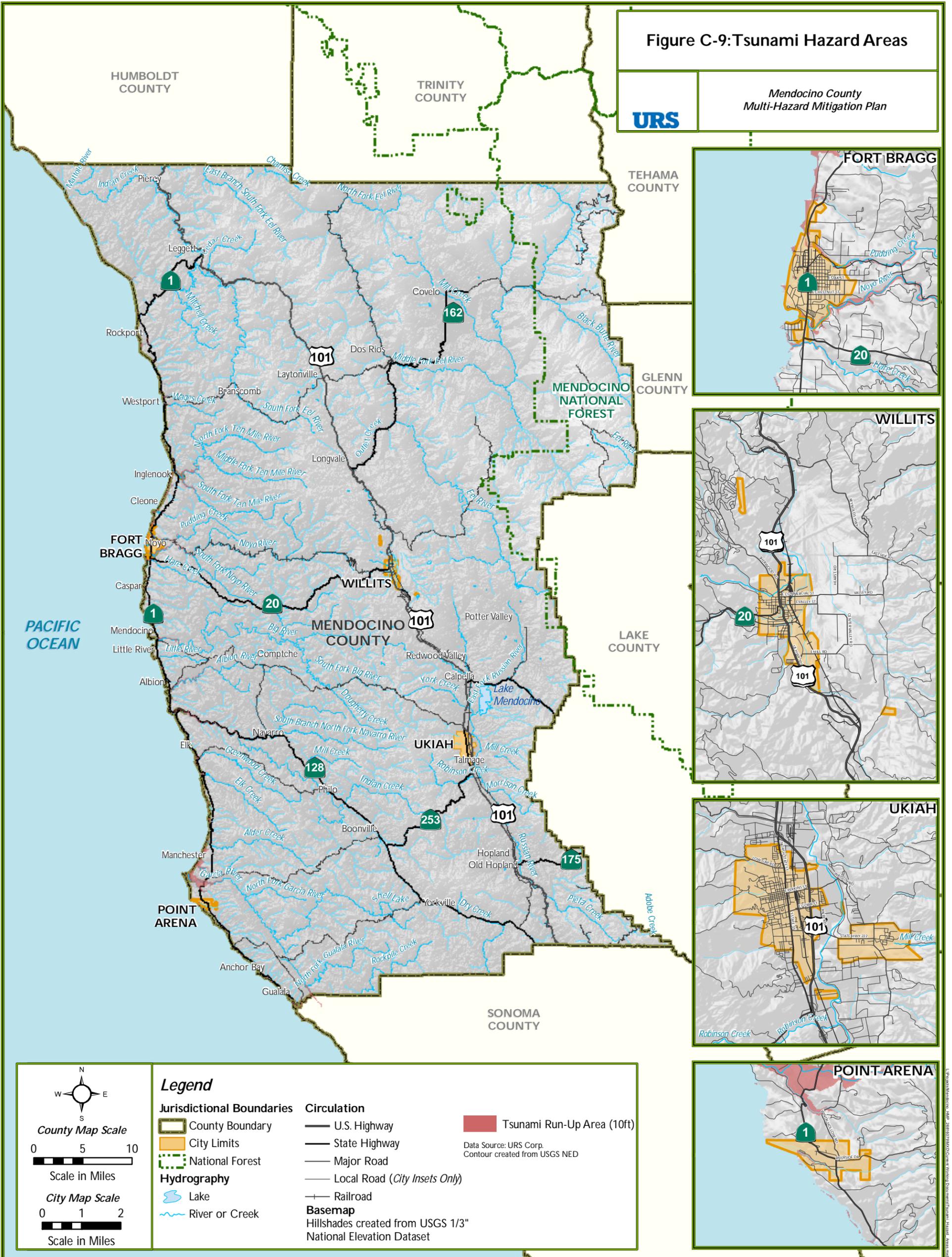
- Low, 0 - 14 Degrees
- Moderate, 14 - 32 Degrees
- High, 32 - 72 Degrees

The main factors contributing to landslides are loose or weakly consolidated rock or soils, steep slopes, and water. Human influences include septic tank systems, excessive irrigation, and poorly constructed or incorrectly graded cuts and fills. The potential for landslides is high in most of the coastal zone; slides most frequently occur along road cuts, steep valleys and stream canyons, and along coastal cliffs. They are particularly common in the San Andreas fault zone along the Garcia and Gualala Rivers. - Mendocino County General Plan

Figure C-9: Tsunami Hazard Areas

URS

Mendocino County  
Multi-Hazard Mitigation Plan



**Legend**

**Jurisdictional Boundaries**

- County Boundary
- City Limits
- National Forest

**Hydrography**

- Lake
- River or Creek

**Circulation**

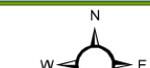
- U.S. Highway
- State Highway
- Major Road
- Local Road (*City Insets Only*)
- Railroad

**Basemap**

Hillshades created from USGS 1/3" National Elevation Dataset

Tsunami Run-Up Area (10ft)

Data Source: URS Corp.  
Contour created from USGS NED



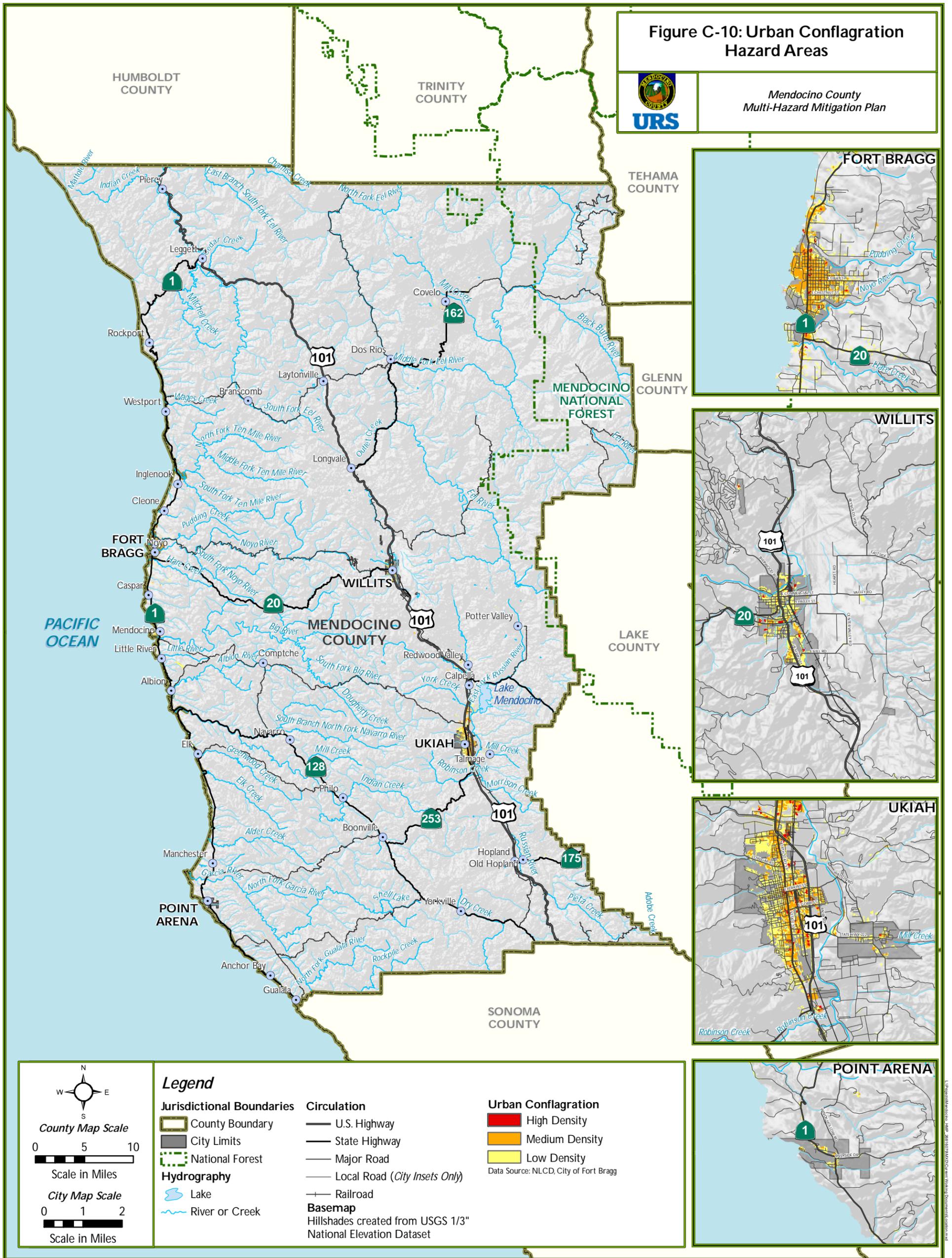
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Scale in Miles

City Map Scale  
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Scale in Miles

**Figure C-10: Urban Conflagration Hazard Areas**



*Mendocino County  
Multi-Hazard Mitigation Plan*



HUMBOLDT COUNTY

TRINITY COUNTY

TEHAMA COUNTY

GLENN COUNTY

LAKE COUNTY

SONOMA COUNTY

PACIFIC OCEAN

**FORT BRAGG**

**WILLITS**

**UKIAH**

**POINT ARENA**

**Legend**

**Jurisdictional Boundaries**

- County Boundary
- City Limits
- National Forest

**Hydrography**

- Lake
- River or Creek

**Circulation**

- U.S. Highway
- State Highway
- Major Road
- Local Road (*City Insets Only*)
- Railroad

**Basemap**

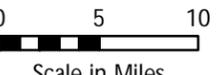
Hillshades created from USGS 1/3" National Elevation Dataset

**Urban Conflagration**

- High Density
- Medium Density
- Low Density

Data Source: NLCD, City of Fort Bragg

County Map Scale

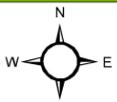


Scale in Miles

City Map Scale



Scale in Miles

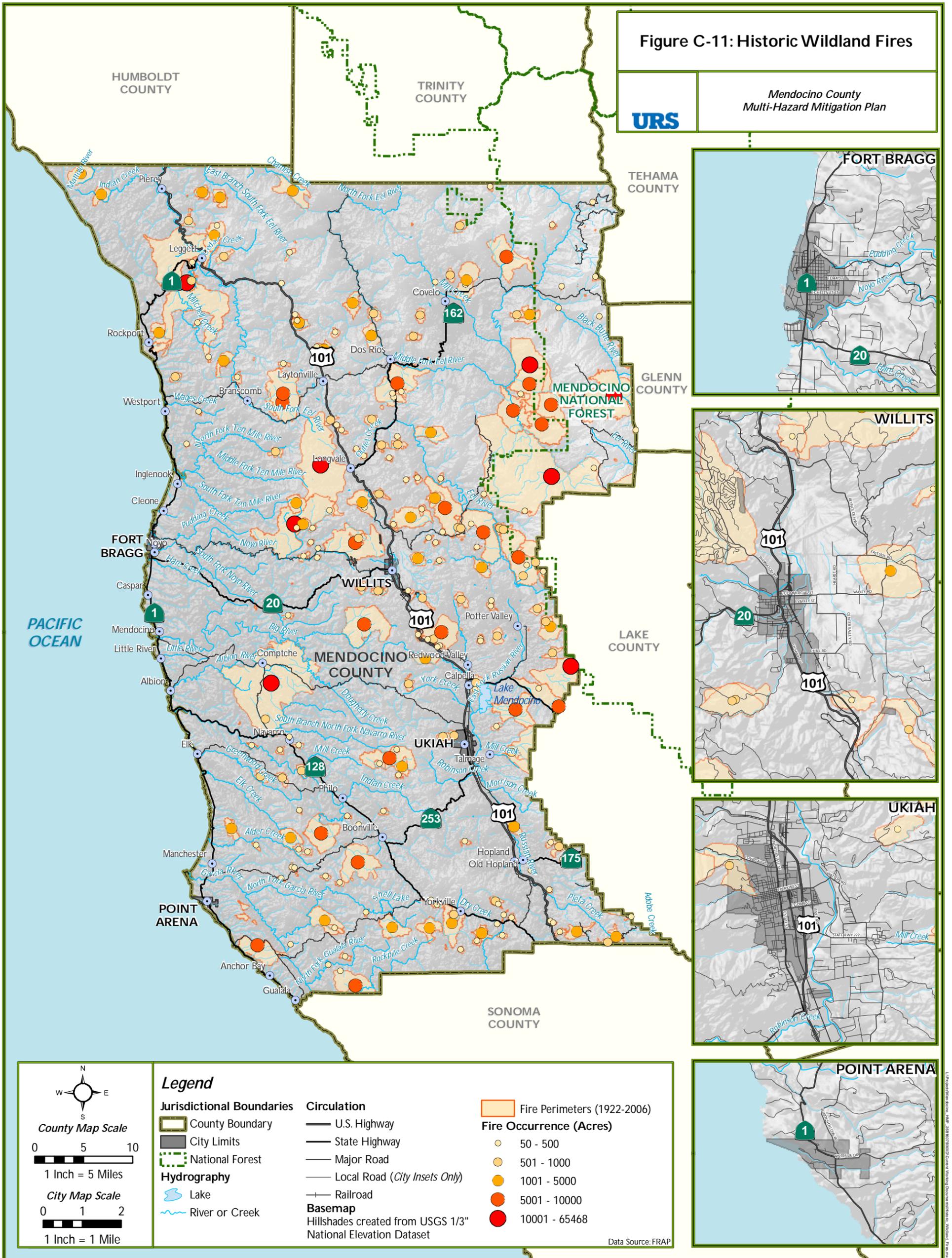


L:\Projects\MapInfo\1488\_2015\1073\MapInfo\MapInfo Documents\Urban Conflagration.mxd

Figure C-11: Historic Wildland Fires

URS

Mendocino County  
Multi-Hazard Mitigation Plan



PACIFIC OCEAN

HUMBOLDT COUNTY

TRINITY COUNTY

TEHAMA COUNTY

GLENN COUNTY

LAKE COUNTY

SONOMA COUNTY

FORT BRAGG

WILLITS

UKIAH

POINT ARENA

**Legend**

**Jurisdictional Boundaries**

- County Boundary
- City Limits
- National Forest

**Hydrography**

- Lake
- River or Creek

**Circulation**

- U.S. Highway
- State Highway
- Major Road
- Local Road (*City Insets Only*)
- Railroad

**Basemap**

Hillshades created from USGS 1/3" National Elevation Dataset

Fire Perimeters (1922-2006)

**Fire Occurrence (Acres)**

- 50 - 500
- 501 - 1000
- 1001 - 5000
- 5001 - 10000
- 10001 - 65468

Data Source: FRAP

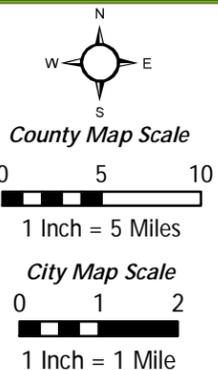
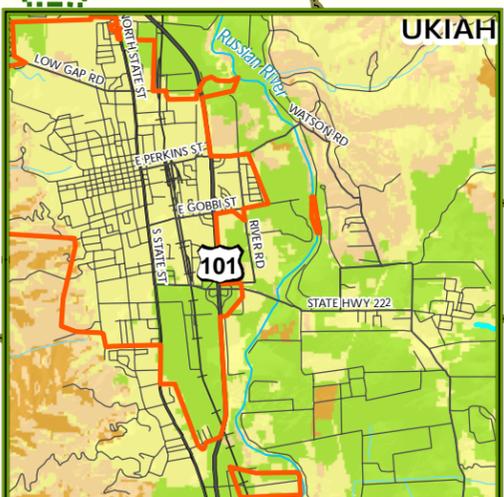
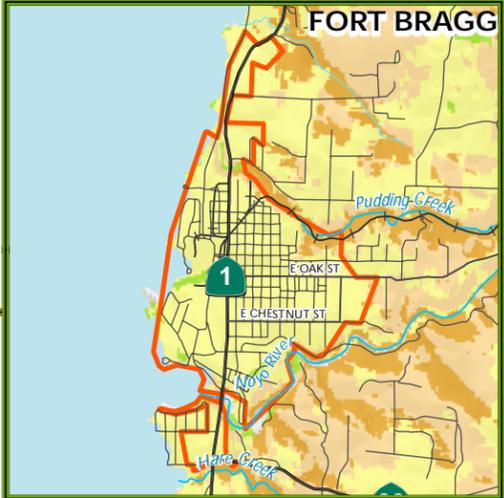


Figure C-12: Wildland Fire Hazard Areas

URS  
Mendocino County  
Multi-Hazard Mitigation Plan



**County Map Scale**  
0 5 10  
Scale in Miles

**City Map Scale**  
0 1  
Scale in Miles

**Legend**

**Jurisdictional Boundaries**  
 County Boundary  
 City Limits  
 National Forest

**Hydrography**  
 Lake  
 River or Creek

**Circulation**  
 U.S. Highway  
 State Highway  
 Major Road  
 Local Road (City Insets Only)  
 Railroad

**Fuel Rank**  
 Low  
 Moderate  
 High  
 Very High  
 Data Source: FRAP

**Basemap**  
 Hillshades created from USGS 1/3" National Elevation Dataset

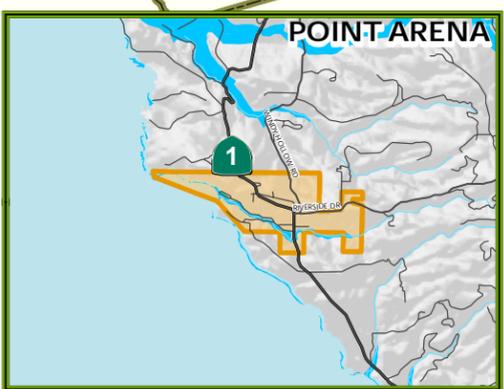
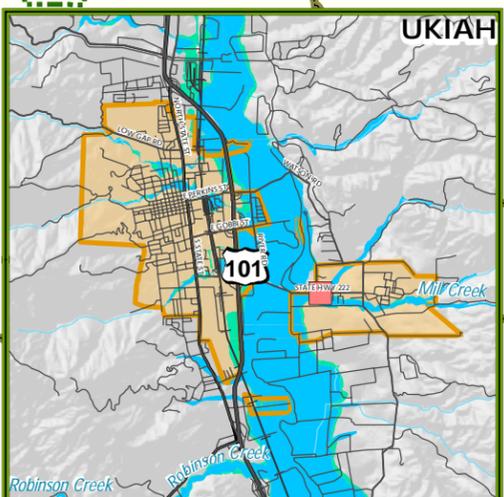
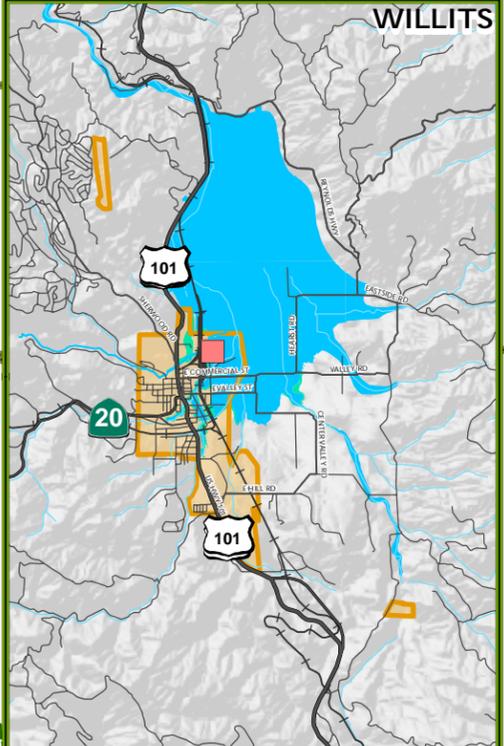
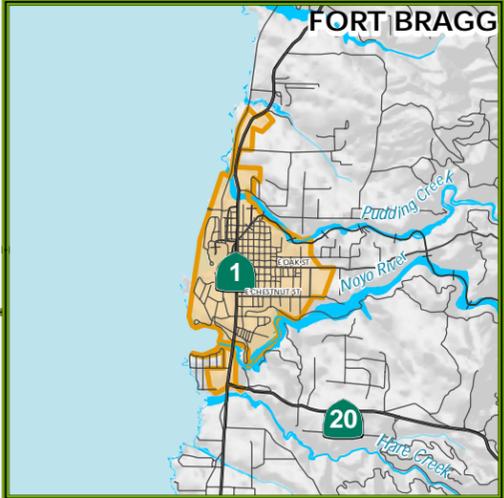
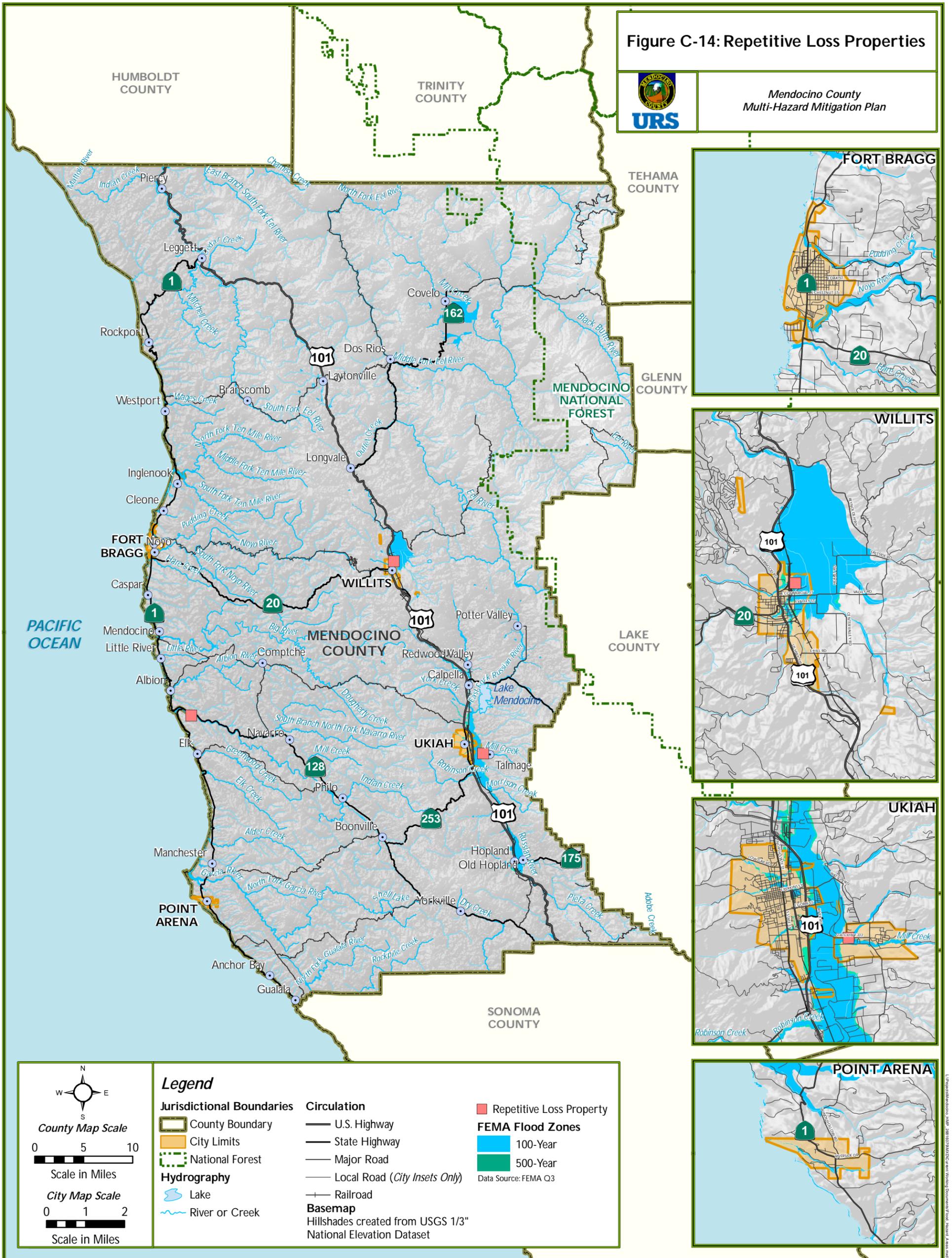
U:\GIS\Projects\2018\20180727\MDC\Multi-Hazard Mitigation Plan\Map Documents\Figure C-12: Wildland Fire Hazard Areas.mxd



Figure C-14: Repetitive Loss Properties



Mendocino County  
Multi-Hazard Mitigation Plan



C:\Users\james\Documents\2018\2018\2018\MDC\MDC\Multi-Hazard Mitigation Plan\Figure C-14: Repetitive Loss Properties.mxd

Figure C-15: Critical Facilities



Mendocino County  
Multi-Hazard Mitigation Plan



HUMBOLDT COUNTY

TRINITY COUNTY

TEHAMA COUNTY

GLENN COUNTY

LAKE COUNTY

SONOMA COUNTY

PACIFIC OCEAN

FORT BRAGG

WILLITS

UKIAH

POINT ARENA

**Legend**

**Jurisdictional Boundaries**

- County Boundary
- City Limits
- National Forest

**Hydrography**

- Lake
- River or Creek

**Circulation**

- U.S. Highway
- State Highway
- Major Road
- Local Road (City Insets Only)
- Railroad

**Critical Facilities**

- Care
- Community
- Educational
- Emergency Response
- Government

**Basemap**

Hillshades created from USGS 1/3" National Elevation Dataset

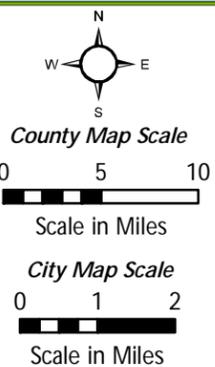
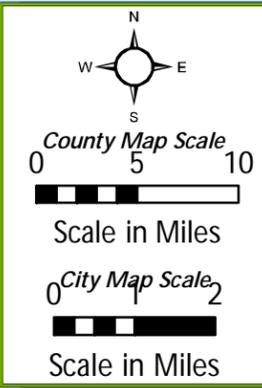
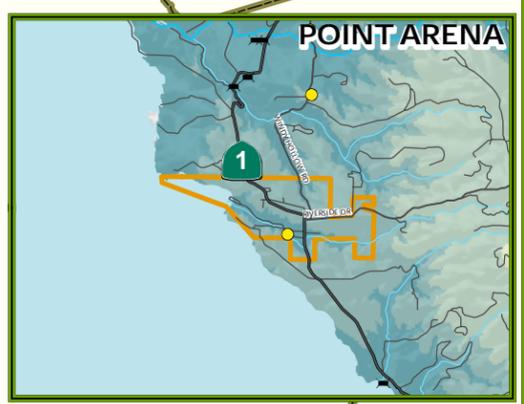
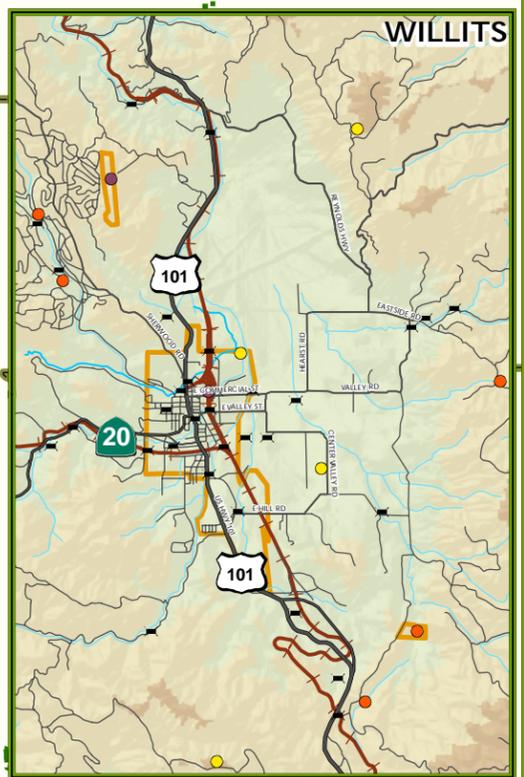


Figure C-16: Critical Infrastructure



Mendocino County  
Multi-Hazard Mitigation Plan



Legend		Critical Facilities	
<b>Jurisdictional Boundaries</b>	<b>Circulation</b>	<span style="color: red;">●</span> Dams	<b>Basemap</b> Hillshades created from USGS 1/3" National Elevation Dataset
<span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> County Boundary	<span style="border-bottom: 2px solid black; width: 20px;"></span> U.S. Highway	<span style="color: purple;">●</span> Transportation	
<span style="border: 1px dashed orange; display: inline-block; width: 10px; height: 10px;"></span> City Limits	<span style="border-bottom: 1px solid black; width: 20px;"></span> State Highway	<span style="color: yellow;">●</span> Utility	
<span style="border: 1px dashed green; display: inline-block; width: 10px; height: 10px;"></span> National Forest	<span style="border-bottom: 1px solid gray; width: 20px;"></span> Major Road		
<b>Hydrography</b>	<span style="border-bottom: 1px solid gray; width: 20px;"></span> Local Road (City Insets Only)		
<span style="display: inline-block; width: 10px; height: 10px; background-color: lightblue;"></span> Lake	<span style="border-bottom: 1px solid red; width: 20px;"></span> Railroad		
<span style="display: inline-block; width: 10px; height: 10px; background-color: lightblue; border-bottom: 1px solid blue;"></span> River or Creek	<span style="border-bottom: 1px dashed black; width: 20px;"></span> Bridge		