

## **Executive Summary**

This Plan analyses the risk posed to people and property in Sonoma County by earthquakes, landslides, floods, and wildland fires, and presents a list of mitigation actions that the County can implement prior to such events to reduce the personal harm and property damage caused by them. This Plan represents the County's commitment to pre-disaster mitigation, prevention and preparation. It helps fulfill the County's regulatory obligations as established by law and serves as a guide for decision makers as they commit resources to reduce the impacts of such hazards. It also serves as the basis for the State and/or Federal government to provide technical and financial assistance for mitigation programs and projects.

Hazard Mitigation is defined as any sustained action taken to reduce or eliminate long term risk to human life and property. Mitigation can reduce the enormous cost of disasters to property owners and all levels of government. In addition, it can protect critical community facilities, reduce exposure to liability, and minimize community disruption.

No amount of planning or mitigation can prevent disasters from occurring or eliminate the risk and impacts of such events all together. Natural disasters will continue to occur. This Plan seeks to identify where the County can take reasonable actions to minimize the adverse effects and dangers from these disaster events before they occur. Though the County will take actions to increase readiness to respond to such events and/or reduce the potential for damage and harm from such events, the potential for significant harm and damage arising from natural disasters remains. Therefore each individual has a responsibility to be aware of the potential hazards where they live and to do what they can as an individual to minimize their own household's vulnerability to such events.

## **Hazard and Risk Assessment**

Sonoma County is home to a variety of hazards, all of which have the potential to cause death, injury, property damage and economic loss. This Plan focuses on those hazards considered to be significant in Sonoma County, earthquakes, landslides, floods and wildland fires. Each of these hazards is examined in depth by describing:

- their physical characteristics;
- past occurrences in the County;
- likelihood of future occurrence;
- vulnerability of the people and structures in the County, especially critical facilities; and
- potential impact of future events on the County's people, built environment, economy, and way of life.

Earthquake, although less frequent than other hazards, has a high probability of future occurrence, and has the greatest potential for loss of life and property. Every resident and structure in the County is exposed to a high earthquake hazard, and a major active fault runs directly beneath the most densely populated areas of the County. Every part of Sonoma County could be shaken by an earthquake. Therefore, every building, road, pipeline, and other structure in the county is vulnerable to earthquakes and could be damaged. Some of these structures face an elevated risk because they are located in high hazard zones, such as near the fault, on liquefiable soils, or on slopes subject to landslides. Other structures face high risk because their construction quality is inadequate to withstand strong shaking, primarily because

they were built decades ago before modern building codes were enacted. Some structures house critical County functions, such as emergency response activities, and it is important that these structures remain functional after an earthquake.

Landslides are also a common hazard in the County, occurring frequently during high rainfall years. The rolling hills, coastal ranges, and steep canyons that characterize Sonoma County's landscape contribute to a widespread landslide hazard. Although generally confined to site-specific incidences, there is potential for future large landslide or debris flow events such as the Rio Nido debris flow that occurred during the 1998 El Nino storms. Areas of the County that are vulnerable to landslide hazards contain hundreds of structures, roads, sidewalks, underground utilities (water pipes, sewer lines, storm drains, natural gas lines, conduits) and aboveground utilities (electricity, telecommunications, cable). They include roads that are critical for emergency access and evacuation for some communities. And, of course, many homes, businesses and some government offices are located in areas at risk. As development spreads into the County's hilly regions, the potential for damage, casualties and economic losses grow.

The frequency of flooding in Sonoma County far exceeds that of any other hazard. The County experienced twelve flood events since 1991, with seven of those events resulting in both state and federal disaster declarations. Sonoma County has the highest number of repetitive flood loss properties west of the Rockies. Damaging floods most frequently occur along the Russian River, the Petaluma River, and Sonoma Creek; the tributaries to these flooding sources; and along the coastal areas, including the bay. Approximately 77 square miles of unincorporated County land is located within a Special Flood Hazard Area (100-Year Floodplain), representing approximately five percent of the total unincorporated area of Sonoma. Approximately 3,000 private buildings are located within the 100-year floodplain. County infrastructure including roads and water treatment facilities are also exposed to the flood hazard.

Wildland fires, particularly wildland/urban interface fires, have historically occurred in Sonoma County, with two fires resulting in both state and federally declared disasters. The increasing development in the County places many more people in the path of potential future wildfires. The combination of highly flammable fuel, long dry summers and steep slopes creates a significant natural hazard of large wildland fires in many areas of Sonoma County. An estimated 33,900 people in unincorporated Sonoma County live in areas potentially at risk of wildland fires, representing seven percent of the total population. The main type of government facility located in high wildfire risk areas is fire stations: thirty fire stations are located in high wildfire risk areas in the County. Numerous County, state and federal roads and highways pass through high wildfire risk areas. Any of these roads could be temporarily closed if a fire is burning in its vicinity. Closure of these routes would cause serious transportation problems for County residents. It could also hamper access of emergency responders. The increasing development in the County places many more people in the path of potential future wildfires.

## **Capability Assessment**

One of the ways the County of Sonoma helps protect and maintain the health, safety and welfare of the community is by working to reduce the County's level of risk to natural disasters such as earthquakes, landslides, floods and wildland fires. The County can use a variety of different tools, assets, and authorities to effectively reduce or mitigate the impacts of natural disasters. These include voluntary and mandatory measures; individual and community efforts; private and public actions; and preventive as well as responsive approaches. Example

mitigation activities include educating citizens, enforcing building and development codes, carrying out capital improvement projects, adopting plans setting forth goals, policies and actions, establishing incentive programs and, in some cases, improving emergency response and preparation.

The capabilities available to Sonoma County fall into the following broad categories: Agencies and People, Plans, Codes and Regulations, Programs and Mitigation Activities, and Financial Resources. The County's efforts to minimize harm to County residents caused by disasters go above and beyond many state and federal requirements, but there are some areas where the County may have the capability to do more.

## **Mitigation Strategy**

The Sonoma County mitigation strategy is derived from the in-depth review of the existing vulnerabilities and capabilities outlined in this plan, combined with a vision for creating a disaster resistant and sustainable community for the future. This vision is based on informed assumptions, recognizes both mitigation challenges and opportunities, and is demonstrated by the goals and objectives outlined below.

The cornerstone of mitigation in Sonoma County is to ensure all construction is properly sited and built. This is best accomplished through the County's land use, zoning, and building code requirements. Implicit in this plan is the assumption that the County will continue to enforce the existing policies, plans, and codes. The greatest challenge the County faces in mitigating the impacts of future natural hazard events lies in the vulnerability of its existing public and private buildings and infrastructure.

It must be recognized that increasing the disaster resiliency and sustainability of Sonoma County will require a substantial investment of resources. Improvements can continue to be made through traditional programs; however many of the mitigation objectives and actions included in this plan cannot be implemented without external funding sources.

Multiple factors were considered to establish the mitigation priorities included in this plan. Highest priority rankings were assigned to those mitigation measures that met three primary criteria: 1) greatest potential for protecting life and property; 2) greatest potential for maintaining critical county functions and operability following a disaster; and 3) achievability in terms of community support, environmental factors, and cost effectiveness.

Clearly earthquakes have the potential to affect the largest number of people, critical facilities, and buildings and to cause the greatest economic losses. This fact combined with the relatively high probability of an earthquake occurrence in the next several decades makes increasing disaster resistance and readiness to earthquakes a high priority. Because of their frequency, and the high number of past disasters and repetitive losses, flood measures are given a high priority as well. Wildland fire has the potential for significant property damage in the urban interface areas, and is the only event where a rapid response can have a dramatic impact on fire spread. Therefore, measures that improve emergency communications and response are considered a high priority. Unlike earthquake and flood, it is more difficult to project where and when the next landslide event may occur. Landslides tend to be more localized, generally affect smaller numbers of people, and can be extremely costly to mitigate. Therefore, they have been assigned a lower priority for purposes of this plan.

Given the extreme importance of maintaining critical government functions in times of disaster and the large number of the population who depend and rely on government services and infrastructure, those mitigation measures which improve government disaster resistance, readiness, or recovery ability are generally given higher priority than mitigation of privately owned buildings in which the loss or damage affects relatively few. The exception to this is private buildings which serve or house larger numbers of people or which have incurred repetitive losses, such as homes along the Russian River.

Using the above rationale for establishing mitigation priorities, each mitigation action included in the plan is assigned a priority ranking of either (a) highest, (b) high, or (c) important. Implementation plans are included for the mitigation actions receiving the highest ranking.

## **Goals, Objectives and Actions**

Four goals have been identified to reduce the risk of natural hazards in Sonoma County.

**Goal 1:** Reduce the vulnerability of people and property exposed to earthquake hazards in Sonoma County.

**Goal 2:** Reduce the vulnerability of people and property exposed to landslide hazards in Sonoma County.

**Goal 3:** Reduce the vulnerability of people and property exposed to flood hazards in Sonoma County.

**Goal 4:** Reduce the vulnerability of people and property exposed to wildland fire hazards in Sonoma County.

Six objectives have been identified to organize mitigation actions within each hazard. These are:

1. Assure that adequate and up to date natural hazard information and maps are available and utilized to guide decisions that impact risk.
2. Update and enforce County codes to minimize the risks of natural hazards.
3. Reduce vulnerability of public buildings at risk from natural hazards.
4. Improve the ability of county infrastructure to withstand natural hazard events.
5. Reduce natural hazard risk and increase the mitigation capability of Sonoma County residents, businesses and others who could be affected by hazards.
6. Increase the County capability to respond to and recover from emergencies and disasters caused by natural hazards.

The County identified 108 actions to meet these objectives in three priority categories. Fifty-one of those mitigation actions are assigned the highest priority ranking and are listed below. Some mitigation actions meet objectives for multiple hazards, others are hazard specific.

### **Multi-Hazard Mitigation Actions:**

- Provide hazard information to building and design professionals, land developers, real estate agencies and others so that they have access to all maps identifying natural hazards in Sonoma County.
- Enhance appropriate county websites to provide convenient public access to natural hazard maps, and educational materials.
- Consider and apply available natural hazard information in the review of project applications and other decision-making that impact risk.
- Improve county communications capacity and interoperability capabilities.
- Where needed to facilitate disaster recovery, adopt code regulations to set forth the requirements and procedures applicable to the repair and reconstruction of structures damaged by natural and man-made disasters.

### **Earthquake Mitigation Actions:**

- Adopt an ordinance to require strengthening and/or reinforcement of unreinforced masonry buildings, except residential structures, considering the cost of the work and the value, frequency of use, and level of occupancy of the buildings.
- Seek funding to engage an engineering consultant to conduct a seismic evaluation of facilities critical to emergency response or recovery operations and buildings with high occupancy. Incorporate seismic assessment upgrades in major remodel projects at existing buildings. All new construction shall conform to current codes at the time of the permit.
- Develop a strategy to strengthen or replace county owned and used emergency response facilities that have structural weaknesses as determined by the priorities identified through the engineering analysis cited above.
- Seek funding and authorization to include seismic upgrades to planned major repairs of county buildings to increase resistance to earthquake damage, especially buildings critical to emergency response and recovery. These include, but shall not be limited to, the buildings proposed for remodeling in the 2006-2011 Capital Project Plan.
- For critical county leased facilities constructed before the current edition of the California Building Code (2001), review seismic vulnerability prior to renewing leases on buildings that do not meet appropriate seismic safety standards for the use of such buildings.
- Carry out seismic retrofitting or replacement of County owned bridges to make them more earthquake resistant. Seek to fund and commence improvements and/or replacements on 14 additional bridges.
- Work with Caltrans and other appropriate government agencies to retrofit or replace state highway bridges.

- Develop a strategy and secure funding to relocate critical Information Systems Department equipment and facilities from their current location to reduce their vulnerability to earthquake groundshaking.
- Develop a strategic plan for damage assessment and recovery of essential public facilities following earthquakes, particularly those of high public occupancy, as part of the County's emergency response planning.
- Evaluate existing emergency power systems at county facilities and provide emergency power generation capacity, or have rental/lease agreements for these generators, at county facilities critical for emergency response and recovery to ensure continuity of government services.

### **Flood Mitigation Actions:**

- Incorporate digital flood hazard maps when they become available from FEMA and maintain updated flood hazard maps in County GIS. Review and update the County F1 and F2 Combining District and make changes as appropriate.
- Consider participation in FEMA's Map Modernization Program through participation as a Cooperating Technical Partner (CTP). Request that FEMA carry out flood studies to provide more accurate mapping of the floodway and floodplain boundaries. Actively participate in the review of these maps to assure they are based on updated topographic maps and flood models, and incorporate up-to-date flood data available from flood damage assessment reports, consultant reports, repetitive loss studies, site specific flood evaluation determinations, and other local, regional, state or federal sources.
- Comply with and enforce all applicable design and siting requirements established by County Codes to increase the safety and disaster resistance of new or existing buildings whether private or public.
- Prepare and adopt an ordinance expanding zero net fill requirements to all unincorporated areas subject to the FEMA flood zones.
- Update the County's Flood Damage Prevention ordinance (Chapter 7b of the County Code) where necessary to comply with FEMA and NFIP requirements.
- Evaluate and confirm condition assessments. Develop a strategy to elevate, relocate or floodproof Emergency Response and Critical Facilities that are known to be in a flood zone or have a history of repetitive flooding. Incorporate flood hazard assessments into site selection and design for new buildings.
- Incorporate flood hazard mitigation into major repair, rehabilitation or remodeling projects involving County Emergency Response and Critical Facilities to the extent feasible.
- Incorporate flood hazard assessment and mitigation into all infrastructure repair, maintenance or improvement projects within the 100-year flood zone to the extent possible.

- Implement citizen and contractor education and awareness programs via community outreach, information kiosks, media and County websites. Continue cooperation with other agencies and jurisdictions such as the Red Cross.
- Seek funding to continue and accelerate the flood elevation program to address the remaining repetitive loss properties both within and outside the mapped flood zones as well as other qualifying properties within the flood zones.
- In addition to continuing the flood elevation program, explore other means to reduce flood risks such as, but not limited to, public acquisition, flood proofing, and relocation of flood prone properties.
- Encourage and provide incentives for private landowners to consolidate undeveloped substandard lots in flood zones.
- Encourage wider compliance with flood insurance requirements and provide more frequent verification of flood insurance coverage on parcels in the flood zones.
- Work with the Sonoma County Redevelopment Agency, the Chamber of Commerce and others to reduce the level of flood damage to commercial properties where elevation is not an option.
- Provide emergency power generation capacity, or have rental/lease agreements for these generators, in critical county facilities and buildings to ensure continuity of government and services.

#### **Wildland Fire Mitigation Actions:**

- Prepare maps showing secondary private roadways, ranch roads and timber roads in high fire hazard areas as well as water bodies that may be utilized in fire fighting operations.
- Consider code amendments to increase fire prevention and resistance in high fire hazard severity zones including, but not limited to, establishing a greater buffer zone between residential properties and wildfire hazard areas.
- Ensure uniform enforcement of the Fire safety regulations in Chapter 13 of the County Code, particularly the Firesafe Standards.
- Increase Fire Marshal capacity to periodically inspect properties for compliance with vegetation management standards.
- Provide assistance to local fire service agencies in adopting and enforcing fire safety regulations and work with local agencies to develop proposed improvements to county codes and standards.
- Conduct a systematic fire safety analysis of all county owned and used emergency response and critical facilities that have been identified as being in wildland fire zones.

Prioritize evaluations based on use and occupancy with a focus on those facilities critical to emergency response or recovery operations and buildings with high occupancy.

- Conduct an analysis of County emergency response and critical facilities identified as being in Wildland Fire Zones to verify reliable water source for fire suppression for existing development. Develop a strategy to make improvements as required.
- Work with the California Division of Forestry and Fire Protection and local fire districts to improve vegetation management consistent with the Public Resources and County Codes and scenic resource policies. Support hazardous fuel reduction programs developed through “Community Wildfire Protection Plans” within the fire districts included in County Service Area 40.
- Ensure a reliable water source for fire suppression for existing development.
- Continue cooperation with other fire-fighting agencies, districts and jurisdictions, including the California Division of Forestry and Fire Protection to ensure that all fire management decisions are based on the most current information and fire-fighting efforts are coordinated.

## **Plan Implementation**

An implementation strategy is the key to any successful planning effort. For this first five year local hazard mitigation plan, an implementation strategy is prepared for only the highest priority actions listed above. Subsequent updates to this mitigation plan may address the other priorities identified in this plan. The implementation strategy identifies who has responsibility for the action, the estimated timeframe for completion, and estimated funding and/or funding sources to support implementation.

The mitigation objectives and actions outlined in the previous section are designed to be carried out through the normal governmental and operational mechanisms used by the County in the performances of its duties and responsibilities on a day to day basis. To the extent possible, mitigation projects are most successful when fully integrated into on-going programs and mechanisms rather than establishing parallel or new mechanisms for implementation. Therefore, the County will strive to fully incorporate the Mitigation Strategy Implementation Plan into existing programs. Additionally, to ensure consistency with overall County development policies, once adopted by the County and accepted by FEMA, the Sonoma County Hazard Mitigation Plan will be integrated with the General Plan Public Safety Element.

However, in this era of increased demands and constrained resources at all levels of government, the lack of resources, especially from external sources, may hamper the ability of the County to implement some mitigation actions identified in the plan or to implement them within the timeframe specified.

To stay compliant with the Disaster Mitigation Act of 2000, Sonoma County will make every effort to update this plan every five years. However, the County may update this plan at its own discretion any time prior to that if new hazard information becomes available, priorities for implementation change, an actual hazard event occurs, or other circumstances prompt an update.