



Local Hazard Mitigation Plan

November 2015

Funded by CDBG





FEMA

November 16, 2015

Francie Sullivan
Mayor
City of Redding
777 Cypress Avenue
Redding, CA 96001

Dear Mayor Sullivan:

We have completed our review of the *City of Redding Local Hazard Mitigation Plan*, officially adopted by the City of Redding, CA on September 16, 2014 and found the Plan to be in conformance with Title 44 Code of Federal Regulations (CFR) Part 201.6 *Local Mitigation Plans*.

The approval of this Plan ensures the City of Redding's continued eligibility for project grants under FEMA's hazard mitigation assistance programs, including Hazard Mitigation Grant Program, Pre-Disaster Mitigation and Flood Mitigation Assistance grant programs. All requests for funding, however, will be evaluated individually according to the specific eligibility, and other requirements of the particular program under which applications are submitted. Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). Additional information regarding the CRS can be found at www.fema.gov/business/nfip/crs.shtm or through your local floodplain manager.

FEMA's approval of the *City of Redding Local Hazard Mitigation Plan* is for a period of five years, effective starting the date of this letter. Prior to November 16, 2020, the City of Redding is required to review and revise its Plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding.

If you have any questions regarding the planning or review processes, please contact Phillip Wang, Hazard Mitigation Planner at (510) 627-7753, or by email at phillip.wang@fema.dhs.gov.

Sincerely,

Jeffrey D. Lusk
Division Director
Mitigation Division
FEMA Region IX

Enclosure

cc: Lily Toy, Associate Planner, City of Redding
Marcia Sully, State Hazard Mitigation Officer
Jose Lara, Chief, Hazard Mitigation Planning



3.3. Resolution

RESOLUTION NO. 2014-095

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF REDDING ADOPTING THE LOCAL HAZARD MITIGATION PLAN 2014 UPDATE

WHEREAS, the City of Redding having developed a Local Hazard Mitigation Plan meeting the requirements of Section 409 of the Robert T. Stanford Disaster Relief and Emergency Assistance Act of 1988 and Section 322 of the Disaster Mitigation Act of 2000; and

WHEREAS, the City of Redding recognizes the consequences of disasters and the need to reduce impacts of natural- and human-caused hazards; and

WHEREAS, the toll on families, individuals, and businesses can be immense after a disaster, both emotionally and economically; and

WHEREAS, time, money, and the emotional effort to respond and recover from these disasters diverting public resources and attention from other important programs and problems;

NOW, THEREFORE, IT IS RESOLVED that the City of Redding does hereby adopt the Local Hazard Mitigation Plan 2014 Update, incorporated by reference and available for review in the City Clerk's office.

I HEREBY CERTIFY that the foregoing resolution was introduced, read, and adopted at a regular meeting of the City Council on the 16th day of September, 2014, by the following vote:

AYES:	COUNCIL MEMBERS:	Cadd, Jones, McArthur, & Sullivan
NOES:	COUNCIL MEMBERS:	None
ABSENT:	COUNCIL MEMBERS:	Bosetti
ABSTAIN:	COUNCIL MEMBERS:	None

/s/ Francie Sullivan

FRANCIE SULLIVAN, Vice Mayor

ATTEST:

APPROVED AS TO FORM:

/s/ Pamela Mize

PAMELA MIZE, City Clerk

/s/ Richard A. Duvernay

RICHARD A. DUVERNAY, City Attorney



1.0 INTRODUCTION

People and property in Redding are at risk from a variety of hazards that have the potential for causing widespread loss of lives and damage to property, infrastructure, and the environment. Hazards are part of the world around us. Natural occurrences such as wildland fires, floods, winter storms, and earthquakes are inevitable and are natural phenomena which we cannot control. The occurrence of a natural hazard can result in damages and hardships for an entire community for many years following the event.

Disasters result when the man-made environment, such as buildings and infrastructure, take place in areas subject to forces of nature. The frequency of disasters is rising at a substantial rate due to the fact that more and more people have chosen to live and work in locations that put them at risk.

The purpose of hazard mitigation is to implement and sustain actions that reduce vulnerability and risk from hazards or reduce the severity of the effects of hazards on people and property. Mitigation actions are both short-term and long-term activities which reduce the cause or occurrence of hazards; reduce exposure to hazards; or reduce effects of hazards through various means, including preparedness, response, and recovery measures. Effective mitigation actions will also reduce the adverse impact and cost of future disasters.

The City of Redding Local Hazard Mitigation Plan includes resources and information to assist in planning for hazards. The plan provides a list of actions that may assist the City of Redding in reducing risk and preventing loss from future hazard events. The actions address hazards, as well as specific activities for, Wildland Fire, Flood, Hazardous Material, Severe Winter Weather, Earthquakes, Utility Disruption, Aviation Disaster, Chemical, Biological, Radiological, Nuclear, Explosives (CBRNE), Dam Overflow or Failure, and Volcanic issues.



7.4 Wildland Fire

7.4.1 Nature

Hills and mountains surround the westerly portion of the City of Redding, which is covered mostly with grasses, brush, Manzanita, oak trees, and gray pines. The climate in this area is generally referred to as "Mediterranean," with rainfall concentrated during the cool winter months. The rains usually cease sometime in April and resume in November.

Summer drought causes vegetation to become extremely dry, and a regional weather phenomenon, the northerly winds, can aggravate an already very hazardous fire situation. The hillside areas of the western portion of the City have, therefore, been classified as a very high fire hazard severity zone. With extreme dryness, relative humidity often 10 percent or less, high temperatures over 100 degrees, and 20 to 40 mph winds, a wildfire can become uncontrolled, spreading through vegetative fuels and exposing and possibly consuming structures.

The fires often begin unnoticed, spreading very quickly, and are usually signaled by dense smoke that fills the air in the immediate area.

Wildfires are ignited 90 percent of the time by human action. Over one-third of all wildland fires originate alongside roads and highways, probably as a result of equipment failure or cigarettes or matches being thrown by passing automobiles. Despite the rising penalties, approximately 22 percent of all fires recorded statewide result from an act of arson. Other causes of wildfires include the following:

Approximately 23 percent of all wildfires that burn over 5,000 acres are caused by power-line failures. Wildfires can also be ignited by sparks from off-road vehicles, construction equipment, and other power-driven equipment used for residential or recreational purposes. In the developed areas, wildfires can start from children playing with matches, unattended recreational fires, equipment use, and sparks from chimneys. Natural causes, primarily lightning, are now relatively minor for most local disastrous fires.

The following three factors contribute significantly to wildland fire behavior:

- **Topography:** As slope increases, the rate of wildland fire spread increases. South-facing slopes are also subject to greater solar radiation, making them drier and thereby intensifying wildland fire behavior. However, ridge tops may mark the end of wildland fire spread, since fire spreads more slowly or may even be unable to spread downhill unless wind-driven.
- **Fuel:** Weight and volume are the two methods of classifying fuel, with volume also referred to as fuel loading (measured in tons of vegetation material per acre). Each fuel is assigned a burn index (the estimated amount of potential energy released during a fire), an estimate of the effort required to contain a wildfire and an expected flame length. The fuel's continuity is also an important factor, both horizontally and vertically.



- Weather: Variation on weather conditions has a significant effect on the occurrences and behavior of wildfires. Short-term conditions, such as high heat, low humidity and high winds, facilitate the ignition and rapid spread of fires. Conversely, cool temperatures, high humidity and little to no wind reduce the risk of wildfires and allow fires to be contained more readily. Long-term conditions, such as prolonged droughts, also play a major role in fire susceptibility.

Other factors increase the wildfire hazard. These include dense vegetation growth and large accumulation of dead plant materials in areas that have not been mitigated or burned for many years. Steep terrain compounds the wildfire risk because fires normally burn much faster uphill. Rugged terrain also hinders fire-suppression attempts by hampering the mobility effectiveness of firefighters and equipment.

If not promptly controlled, wildland fires may grow into an emergency or disaster. Firestorms occur during extreme weather with such intensity that fire suppression is virtually impossible. These events typically burn until the conditions change or the fuel is exhausted. Even small fires can threaten lives and resources and destroy improved properties.

It is also important to note that in addition to affecting people, wildland fires may severely affect livestock and pets. Such events may require the emergency watering/feeding, sheltering, evacuation, and even burying of animals.

7.4.2 Effects of Wildfires

Wildfires generally have the most impact on the natural environment. Although some ecosystems are dependent upon recurrent fire to survive, these communities are unique. Watershed, wildlife, and recreational areas are lost due to wildfire. After the fire has been extinguished, the burned land is laid bare of its protective vegetation cover and is susceptible to excessive runoff and erosion. The fire will often destroy the root system of shrubs and grasses that aid in stabilizing slope material. When the winter rains come, the possibility of landslides and debris/mud flows are greatly increased.

The impacts of wildfire often strain public resources, including emergency response and utilities. Water reserves are drawn down, power lines become disabled, telephone service can be disrupted, roads can be blocked, etc. Flood-control facilities may be inadequate to handle the increased storm-runoff debris from barren and burned hills.

Integration of five fire determinants (human proximity, vegetation, access, slope, and wind direction) has delineated two natural fire hazard potential zones for the City of Redding. Very high fire hazard severity risk areas lie to the immediate west of central Redding and north and northeast Redding, with Manzanita, buck brush, and other highly combustible vegetation, along with steep 20 to 40 percent slope, and somewhat limited access. The medium to low risk areas lie in the vicinity of developed property with grass and scattered oak over more level to gentle (flat to 20 percent) slope and with available access. Areas not threatened by fire risk are within developed areas with cultivated urban cover and available urban access.



7.4.3 Wildland Urban Interface (WUI)

Wildland Urban Interface (WUI) fires are a significant hazard. In a study conducted by the U.S. Fire Administration in 2002, the history of urban interface fires, which have caused significant property loss, was discussed, with one of the most destructive fires occurring in the State of California with the 1991 WUI fire in the East Bay Hills of Oakland, in which 25 lives were lost and more than 3,000 structures destroyed. Fire crews were overwhelmed and the fire destroyed, for the most part, everything in its path.

In general, wildfire is not a major threat in the flat, developed areas of Redding when adequate emergency resources are available. However, fire is a major problem in the fringe-urban and hill areas on the west side of Redding and those additional areas, approximately 39 percent, of the City that are identified as very high fire severity zone. This increased risk is due primarily to a predominance of the north-facing slopes that are characteristically more vegetated than those of the southern aspect. Within the west side, the highest fire risk areas are located in the hilly populated regions. All major determinants of fire risk point to this area as the most critical area for the City of Redding.

The City of Redding has numerous subdivisions on the west side of town which are built on ridge tops with significant fuels with valleys and ravines in alignment with prevailing summer winds which results in a significant fire risk to the community. This is further compounded by the hot, dry, and low humidity levels experienced in Redding during the summer, along with wind events that can result in rapid fire growth and spread.

Once a fire starts, it is influenced by several factors, including fuels, topography, weather, drought, and development, along with the ability to quickly access and contain the fire. The combined conditions are key elements which affect the risk and severity of the fire.

The major risk involves loss of lives and property which lie in those developed areas identified as in the very high fire severity zones. Here property damage is not an uncommon occurrence. These interfacing and transitional areas are constantly vulnerable. As development extends more and more into the areas identified as very high fire severity zones, the situation becomes increasingly acute.



The wildland risk to the City of Redding can be attributed to three factors. The first are the ignition sources, the second is the fuel loading, and the third is resources available to address fires. Mitigation must address reducing the fuel-ignition sources, such as juveniles playing with matches and lighters in the open vegetated areas, transient populations occupying areas within the urban interface and utilizing fire, educating the public on better abatement procedures when using mechanical equipment, and disposing properly of cigarettes. The second is reducing the immediate fuel load surrounding the urbanized area within and around the City of Redding on public and private property. The third is adequate staffing and equipment for handling emergency incidents.

The risks associated with future events will continue to increase as the City sees development on previously approved projects in the very high fire hazard severity zone and as new developments are proposed and constructed.

7.4.6 Present and Future Mitigation Efforts

The City has over the last 16 years abated over 749 acres of brush behind homes in the very high fire hazard severity zone on public property. Continuation of fuel-reduction mitigation must continue throughout the very high fire hazard severity zone on both public and private lands.

The City also maintains an Emergency Operations Center to help coordinate information and resources for any type of disaster or threat. Yearly ongoing training, updating of critical information, and drills are conducted to help protect people and property.

All new subdivisions have been approved using the new General Plan regulations and Building and Fire Code adoptions, including residential sprinkler requirements which help mitigate the spread of fire from a residential fire incident to the WUI area. In addition, this may also include one or more of the following: (1) adequate defensible space and development of landscape maintenance districts to maintain defensible space, (2) utilizing noncombustible construction on the exterior, (3) providing two ways in and out, and (4) meeting fire-flow requirements in accordance with the California Fire Code.

7.4.7 Vulnerability:

The City of Redding recently ran a fire scenario on the west side, which was derived from an actual fire occurrence in the area. As a result of the fire-scenario information, it was discovered that 17 percent of all structures in the City could be affected by this fire, with a potential dollar loss of \$135,300,000. This fire would be 10,250 acres in size and displace approximately 13,437 people (See Figure 6).



7.4.8 Mitigations

- Goal 5: Reduce the possibility of property damage and life losses due to wildland fires.*
- Objective 5.A: Enforce Fire and Building Codes and the General Plan for the City of Redding, which will minimize damage to homes and structures from wildland fires.
- Action 5.A.1: Ensure that new subdivisions have adequate fire-protection measures, such as multiple accesses for fire apparatus, noncombustible building construction, residential sprinkler systems, appropriate defensible space, and street widths and grade to accommodate emergency vehicles and evacuees simultaneously.
- Action 5.A.2: Ensure that defensible space is being provided for all new and existing homes. Ensure that roofing material is noncombustible on new homes and that wood shake roofs on existing homes, when replaced, meet Code requirements for non-combustibility. Install a spark-arresting system on chimneys of homes with wood-burning fireplaces. Partial funding is provided for abatement of City properties.
- Action 5.A.3: Continue the development of landscape maintenance districts for new developments to fund ongoing fuel reduction and maintenance of defensible space.
- Objective 5.B: Educate the public about wildland fire dangers and the steps that can be taken to prevent or minimize their effects.
- Action 5.B.1: Ensure that the City provides sufficient resources for public education, wildland fire mitigation and guidance, and emergency planning for the public, as funding becomes available.
- Action 5.B.2: Distribute wildland fire mitigation information to persons applying for building permits in the City of Redding in the very high fire hazard severity zone.
- Objective 5.C: Reduce the probability of fire ignitions.
- Action 5.C.1: Focus on human causes of ignition and address the problem through education and enforcement actions, to include vigorous investigation and prosecution of arson.
- Objective 5.D: Maintain Emergency Operations Center for coordination of information and resources.
- Action 5.D.1: Ensure that annual emergency Operations Center exercise is performed. Funding is available to conduct exercises.
- Objective 5.E: Reduce the potential for destructive actions of the fire once ignition occurs, utilizing fire pre-plans, ensuring a properly trained, staffed, and equipped emergency response capability, and timely response to prevent the spread of the fire, minimizing risks to humans and property.



Objective 4.B: Develop a program to enhance the disaster response skills of City employees.	
Action 4.B.1:	As resources permit, continue to develop the disaster response orientation for City employees.
Action 4.B.2:	Continue to update information for employees that describe their responsibilities following a disaster.
Action 4.B.3:	Continue Emergency Operations Center drills to prepare for city wide emergencies and disasters.
Action 4.B.4:	The City participates in the Cal EMA Safety Assessment Program including assisting in the training of SAP evaluators and SAP coordinators. Currently there are 68 registered SAP evaluators residing within the Shasta County. The City employs approximately 8.
Objective 4.C: Prevent, monitor, and respond to local emergencies by maintaining an up-to-date City Geographic Information System (GIS).	
Action 4.C.1:	Make GIS available to emergency response personnel during an emergency.
Action 4.C.2:	Ensure GIS resources are adequate to maintain critical data base.
Objective 4.D: Enhance the Police and Fire Department's ability to effectively function in disasters.	
Action 4.D.1:	Seek grants to conduct a variety of training programs, classroom and field drills for Police and Fire personnel, including terrorism response, the Incident Command System, NIMS and other appropriate topics.
Action 4.D.2:	Seek Department of Homeland Security Grants to equip field personnel for terrorism incidents.
Action 4.D.3:	Conduct Annual County-Wide Disaster Drills.
Action 4.D.4:	Attend Mutual Aid Region Advisory Committee
Action 4.D.5:	Train personnel in basic ICS/SEM concepts for the purpose of managing large-scale natural and/or manmade disasters.
Action 4.D.6:	Maintain a mobile communication center for special events, emergency responses, drills, or trainings.
Action 4.D.7:	Conduct monthly training for the Redding Police Department's SWAT Team.
Objective 4.E: Continue to implement all current hazard mitigation programs and projects.	
Action 4.E.1:	Review all current hazard mitigation activities and seek to continue their implementation.
Action 4.E.2:	Review all current hazard mitigation activities, as necessary, to develop better ways to implement them.
WILDLAND FIRE	
Goal 5: <i>Reduce deaths, injuries, structural damage and losses from wildfires/structure fires.</i>	
Objective 5.A: Enforce Fire and Building Codes and the General Plan for the City of Redding which will minimize damage to homes and structures from wildland fires.	
Action 5.A.1:	Ensure new subdivisions have adequate fire protection measures such as multi-access for fire apparatus, noncombustible building construction, residential sprinkler systems, appropriate defensible space, street widths and grade to accommodate emergency vehicles and evacuees simultaneously.
Action 5.A.2:	Ensure defensible space is being provided for all new and existing homes; ensure roofing material is noncombustible on new homes and wood shake roofs on existing homes, when replaced, meet code requirements for non-combustibility; and installation of a spark arresting system on chimneys of homes with wood burning fireplaces. Partial funding is provided for abatement of City properties.
Action 5.A.3:	Continue the development of landscape maintenance districts for new developments to fund ongoing fuel reduction and maintenance of defensible space.
Objective 5.B: Educate the public about wildland fire dangers and the steps that can be taken to prevent or minimize their effects.	
Action 5.B.1:	Ensure the City provides sufficient resources for public education, wildland fire mitigation and guidance, and emergency planning for the public, as funding becomes available.
Action 5.B.2:	Distribute wildland fire mitigation information to persons applying for building permits in the City of Redding in the very high fire hazard severity zone.
Action 5.B.3:	Continue to participate with Shasta County Fire Agencies and California Department of Forestry and Fire Protection in fire prevention education fair at various locations.
Action 5.B.4:	Continue to participate in annual school fire prevention visits to provide fire prevention education.
Objective 5.C: Reduce the probability of fire ignitions.	



City of Redding Hazard Mitigation Plan

Ongoing/ New	Action Item #	Action	Lead Agency	Time Line	Fund Source	Cost	Priority Rating
New	4.D.6	Maintain a mobile communication center for special events, emergency responses, drills, or trainings.	PD	1-5	GF	EC	1
New	4.D.7	Conduct monthly training for the Redding Police Department's SWAT Team.	PD	1-5	GF	EC	1
Ongoing	4.E.1	Review all current hazard mitigation activities and seek to continue their implementation.	FD/PPD	1	DHS	EC	1
Ongoing	4.E.2	Review all current hazard mitigation activities, as necessary; develop better ways to implement them.	All Agencies	1 - 5	GF	EC	1
Ongoing	5.A.1	Ensure new subdivisions have adequate fire protection measures such as multi-access for fire apparatus, noncombustible building construction, residential sprinkler systems, appropriate defensible space, street widths and grade to accommodate emergency vehicles and evacuees simultaneously.	All Agencies	1	GF	EC	1
Ongoing	5.A.2	Ensure defensible space is being provided for all new and existing homes; ensure roofing material is noncombustible on new homes and wood shake roofs on existing homes, when replaced, meet code requirements for non-combustibility; and installation of a spark arresting system on chimneys of homes with wood burning fireplaces. Partial funding is provided for abatement of City properties.	FD	1	GF	EC	1
Ongoing	5.A.3	Continue the development of landscape maintenance districts for new developments to fund ongoing fuel reduction and maintenance of defensible space.	FD	1 - 5	GF	EC	1
Ongoing	5.B.1	Ensure the City provides sufficient education and guidance on wildland fire mitigation and emergency planning for the public as funding becomes available.	FD	1	GF	EC	1
Ongoing	5.B.2	Distribute wildland fire mitigation information to persons applying for building permits in the City of Redding in the very high fire hazard severity zone.	DS/FD	1 - 5	GF	EC	1
New	5.B.3	Continue to participate with Shasta County Fire Agencies and California Department of Forestry and Fire Protection in fire prevention education fair at various locations.	FD	1-5	GF	EC	1
New	5.B.4	Continue to participate in annual school fire prevention visits to provide fire prevention education.	FD	1-5	GF	EC	1
Ongoing	5.C.1	Focus on human causes of ignition and address the problem through education and enforcement actions to include vigorous investigation of prosecution of arson.	FD	1 - 5	GF	EC	1

LEAD	TIME LINE	FUNDING	COST	PRIORITY
CM - City Manager	1: One Year or Less	GF - General Fund	EC - Existing Cost	1 - Highest Priority
DS - Development Services Department	2 - 4: Years	EF - Enterprise Fund	TBD - To Be Determined	2 - Medium Priority
FD - Fire Department	5+: Five Years or More	HMGP - Federal Hazard Mitigation Grant Program		3 - Lowest Priority
MU - Municipal Utilities	1 - 5: Continuous	DHS - Department of Homeland Security		
PD - Police Department		CIP - Capital Improvement Project Funding		
PW - Public Works Department		DS - Development Fees		
SS - Support Services		CDBG - Community Development Block Grants		
EL - Electric		LLAP - Local Levee Assistance Program		

Part 2. Liability of Public Entities and Public Employees (Refs & Annos)

Chapter 1. General Provisions Relating to Liability (Refs & Annos)

Article 2. Liability of Public Entities (Refs & Annos)

West's Ann.Cal.Gov.Code § 815.6

§ 815.6. Mandatory duty of public entity to protect against particular kinds of injuries

Currentness

Where a public entity is under a mandatory duty imposed by an enactment that is designed to protect against the risk of a particular kind of injury, the public entity is liable for an injury of that kind proximately caused by its failure to discharge the duty unless the public entity establishes that it exercised reasonable diligence to discharge the duty.

Credits

(Added by Stats.1963, c. 1681, p. 3268, § 1.)

Editors' Notes

LAW REVISION COMMISSION COMMENTS

This section declares the familiar rule, applicable to both public entities and private persons, that failure to comply with applicable statutory or regulatory standards is negligence unless reasonable diligence has been exercised in an effort to comply with those standards. *Alarid v. Vanier*, 50 Cal.2d 617, 327 P.2d 897 (1958) (setting forth general rule); *Lehmann v. Los Angeles City Bd. of Educ.*, 154 Cal.App.2d 256, 316 P.2d 55 (1957) (applying rule to public entity).

In the sections that follow in this division, there are stated some immunities from this general rule of liability. See, for example, Section 818.2. [4 Cal.L.Rev.Comm. Reports 801 (1963)].

Notes of Decisions (354)

West's Ann. Cal. Gov. Code § 815.6, CA GOVT § 815.6

Current with urgency legislation through Ch. 1016 of 2018 Reg.Sess, and all propositions on 2018 ballot.

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