BIG BEAR FIRE AUTHORITY/CITY OF BIG BEAR LAKE/BIG BEAR CITY COMMUNITY SERVICES DISTRICT

LOCAL HAZARD MITIGATION PLAN

January 2020

Primary Points of Contact:

Mike Maltby
Asst. Chief – Fire Marshal

Big Bear Fire Authority
P. O. Box 2830
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(909) 866-7566 (Office)

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Director of Community Services/
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City of Big Bear Lake
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Big Bear Lake, CA 92315
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Planning Team and Promulgation Authority

This Hazard Mitigation Plan for the Big Bear Fire Authority, City of Big Bear Lake and Big Bear City Community Services District was:

Prepared by:

Signature:_____ Date:_____
Name: Mike Maltby
Title: Asst. Chief – Fire Marshal
Organization: Big Bear Fire Authority

Signature:_____ Date:_____
Name: Phillip K. Mosley
Title: Director of Community Services
Organization: City of Big Bear Lake

Signature:_____ Date:_____
Name: Mary Reeves
Title: General Manager
Organization: Big Bear City Community Services District

Approved by the Big Bear Fire Authority Board:

Approval Attested To By:

Signature:_____ Date:_____
Name: Jeff Willis
Title: Fire Chief
Organization: Big Bear Fire Authority

Approved by the City of Big Bear Lake City Council:

Approval Attested To By:

Signature:_____ Date:_____
Name: Erica Stephenson
Title: City Clerk
Organization: City of Big Bear Lake

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RESOLUTION NO. 2020-XX

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE BIG BEAR FIRE AUTHORITY, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ADOPTING THE 2020 LOCAL HAZARD MITIGATION PLAN UPDATE, AND AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN

WHEREAS, the preservation of life and property is an inherent responsibility of local, State
and Federal government; and

WHEREAS, the Big Bear Fire Authority joined with the City of Big Bear Lake, the Big Bear City Community Services District and agencies in San Bernardino County to develop, adopt and maintain a multi-jurisdictional Hazard Mitigation Plan; and

WHEREAS, the Big Bear Fire Authority is charged and entrusted with the protection of persons and property prior to and during emergencies, and/or disaster conditions; and

WHEREAS, the goal of a Hazard Mitigation Plan is to minimize, reduce or eliminate loss of life and/or property; and

WHEREAS, this Hazard Mitigation Plan represents a comprehensive description of the Big Bear Fire Authority's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural and human-caused hazards; and

WHEREAS, the Big Bear Fire Authority has undertaken a comprehensive planning effort in developing the Local Hazard Mitigation Plan by organizing resources, assessing risks, and developing and implementing a mitigation plan and monitoring process; and

WHEREAS, the Hazard Mitigation Plan is a Federal requirement under the Disaster Mitigation Act of 2000 for the Big Bear Fire Authority, City of Big Bear Lake and the Big Bear City Community Services District to receive Federal funds for disaster recovery and mitigation; and

WHEREAS, the Hazard Mitigation Plan established a coordinated effort to support mitigation activities and identifies measures to combat natural and man-made hazards within our jurisdiction; and

WHEREAS, the Hazard Mitigation Plan is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed and exercised periodically and revised as necessary to meet changing conditions; and

WHEREAS, the Big Bear Fire Authority agrees to adopt this Hazard Mitigation Plan and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the goals and objectives of hazard mitigation within the Big Bear Fire Authority.

NOW, THEREFORE, the Board of Directors of the Big Bear Fire Authority District DOES HEREBY RESOLVE, DETERMINE AND ORDER AS FOLLOWS:

Section 1. The Board approves the Local Hazard Mitigation Plan of the Big Bear Fire Authority.

Section 2. The Board authorizes the Fire Chief to make necessary administrative and operational changes to the plan that are in keeping with the intent of the plan as approved.

Section 3. The Board authorizes the Fire Chief, or his duly appointed representative, to perform all duties required to carry out the Local Hazard Mitigation Plan.

Section 4. That the Board Secretary shall certify to the passage and adoption of this resolution and enter it into the book of original resolutions.

PASSED, APPROVED and ADOPTED this XXth day of XXXXX, 2020.

AYES:
NOES:
ABSENT:

Date

XXXXX, Chairman

ATTEST:

Dawn Marschinke, Board Secretary

RESOLUTION NO. 2020-XX

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BIG BEAR LAKE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ADOPTING THE 2020 LOCAL HAZARD MITIGATION PLAN UPDATE, AUTHORIZING FUTURE NON-SUBSTANTIVE AMENDMENTS TO THE PLAN, AND RESCINDING RESOLUTION NO. 2020-XX

WHEREAS, the preservation of life and property is an inherent responsibility of local, State and Federal government; and

WHEREAS, the City of Big Bear Lake joined with agencies in San Bernardino County to develop, adopt and maintain a multi-jurisdictional Hazard Mitigation Plan; and

WHEREAS, the City is charged and entrusted with the protection of persons and property prior to and during emergencies, and/or disaster conditions; and

WHEREAS, the goal of a Hazard Mitigation Plan is to minimize, reduce or eliminate loss of life and/or property; and

WHEREAS, this Hazard Mitigation Plan represents a comprehensive description of the City's commitment to reducing, preventing or eliminating potential impacts of disasters caused by natural and human-caused hazards; and

WHEREAS, the City of Big Bear Lake previously adopted its Hazard Mitigation Plan with the adoption of Resolution No. 2020-XX; and

WHEREAS, the City Council desires to rescind Resolution No. 2020-XX and adopt the updated Hazard Mitigation Plan in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS, the City has undertaken a comprehensive planning effort in developing the Local Hazard Mitigation Plan by organizing resources, assessing risks, and developing and implementing a mitigation plan and monitoring process; and

WHEREAS, the Hazard Mitigation Plan is a Federal requirement under the Disaster Mitigation Act of 2000 for the City to receive Federal funds for disaster recovery and mitigation; and

WHEREAS, the Hazard Mitigation Plan established a coordinated effort to support mitigation activities and identifies measures to combat natural and man-made hazards within our City; and

WHEREAS, the Hazard Mitigation Plan is an extension of the State of California Multi-Hazard Mitigation Plan, and will be reviewed and exercised periodically and revised as necessary to meet changing conditions; and

WHEREAS, the City of Big Bear Lake agrees to adopt this Hazard Mitigation Plan and urges all officials, employees, public and private organizations, and citizens, individually and collectively, to do their share in furthering the goals and objectives of hazard mitigation within the City of Big Bear Lake.

NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF BIG BEAR LAKE DOES HEREBY RESOLVE, DETERMINE AND ORDER AS FOLLOWS:

Section 1. Resolution No. 2012-04 is hereby rescinded.

Section 2. The City Council approves the Local Hazard Mitigation Plan of the City of Big Bear Lake.

Section 3. The City Council authorizes the Director of Emergency Services to make necessary administrative and operational changes to the plan that are in keeping with the intent of the plan as approved.

Section 4. The City Council authorizes the Director of Emergency Services, or his duly appointed representative, to perform all duties required to carry out the Local Hazard Mitigation Plan.

Section 5. That the City Clerk shall certify to the passage and adoption of this resolution and enter it into the book of original resolutions.

PASSED, APPROVED and ADOPTED this XXth day of XXXXX, 2020.

AYES:
NOES:
ABSENT:

Date , Mayor

ATTEST:

Erica Stephenson, City Clerk

Section 1 – Introduction

1.1 General Description

Emergencies and disasters cause death and/or leave people injured or displaced, cause significant damage to our communities, businesses, public infrastructure and our environment, and cost tremendous amounts in terms of response and recovery dollars and economic loss.

This Local Hazard Mitigation Plan (LHMP) is a multi-jurisdictional plan developed jointly between the City of Big Bear Lake, the Big Bear City Community Services District and the Big Bear Fire Authority. This collaborative plan was developed to ensure that each participating agency has met the requirements of 44 CFR 201.6.

The mission of the Local Hazard Mitigation Plan is to promote sound public policy designed to protect residents, visitors, critical facilities, infrastructure, key resources, private property and the environment from natural hazards throughout the Community Services District, Big Bear Fire Authority and City of Big Bear Lake service areas.

1.2 Purpose and Authority

The Disaster Mitigation Act of 2000 (DMA 2000), Section 322 (a-d) requires that local governments, as a condition of receiving federal disaster mitigation funds, have a mitigation plan that describes the process for identifying hazards, risks and vulnerabilities, identify and prioritize mitigation actions, encourage the development of local mitigation and provide technical support for those efforts. This mitigation plan serves to meet those requirements.

As a multi-jurisdictional plan, the document focuses on mitigating all natural hazards impacting the City of Big Bear Lake and the Big Bear City Community Services District. The Big Bear Fire Authority provides fire suppression and prevention services to the City of Big Bear Lake and the Big Bear City Community Services District under their joint powers authority. As a result, the fire mitigation strategies in this plan are inclusive of all areas served by the Big Bear Fire Authority. In addition to the local coordination of the review and update of this plan, hazard, risk and vulnerability assessment and mitigation strategy development for Big Bear Valley Community Service District areas and Big Bear Fire Authority areas outside of the City of Big Bear Lake's jurisdictional boundaries are included in the San Bernardino County Multi-Jurisdictional Hazard Mitigation Plan approved by FEMA on July 13, 2017.

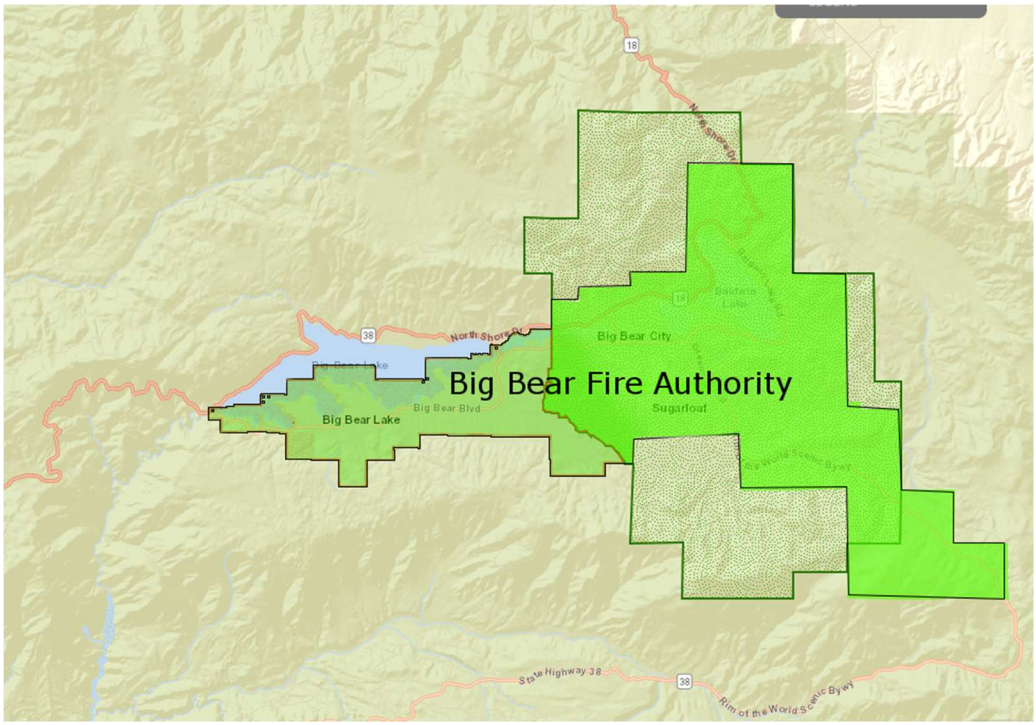
1.3 Community Information

This section is to provide a broad perspective, brief history and describes the makeup and development of the community.

1. Community Makeup and the Big Bear Fire Authority

The City of Big Bear Lake and the Big Bear City Community Services District are independent governmental bodies, but conjoined jurisdictions, which collectively make up what is commonly known as the "Big Bear Valley". The two jurisdictions share many commonalities and would likely be mutually affected by any hazards and/or disasters. In 2012 a Joint Powers Authority was formed combining the Big Bear Lake Fire Department and the Big Bear City Community Services District Fire Department into one agency; the Big Bear Fire Authority. The Big Bear Fire Authority is charged with the protection of lives and property, prior to and during

emergencies, and/or disaster conditions throughout the City of Big Bear Lake and the Big Bear City Community Services District jurisdictions.



2. Topography

The Big Bear Valley is located at an elevated mountain basin formed by the San Bernardino Mountains, with elevations ranging from 6,800 to 7,500 feet above mean sea level. The elevated surrounding terrain effectively isolates the greater Big Bear Basin from all but the coastal influences to the west. Distinguished by its high elevation, mild summers and winter snow, the Big Bear Valley is an important venue for winter sports and year-round recreation.

2. Climate:

The Big Bear Valley enjoys an alpine climate and is located in an area that intercepts water-laden clouds, resulting in annual rainfall and/or snow of 20-35 inches. Precipitation at Big Bear Lake's National Weather Service station from 1960 to 1995 averaged about 18 inches for each six-month season from October to March. The coolest month of the year is January with a mean monthly temperature of 32.4 degrees Fahrenheit. The warmest month is July with a mean monthly temperature of 63.8 degrees Fahrenheit. The area's watershed is mountainous with steep upper slopes leading to a mildly sloping valley.

3. Major River/Watersheds:

Big Bear Lake is a human-made lake, utilized to collect water for irrigation purposes. The Lake is the Northeastern head of the Santa Ana River and is the collection point for watersheds within

the Big Bear Valley. Big Bear Lake is located adjacent to and north of the City boundary with a surface elevation of about 6,743 feet above mean sea level.

4. Population/Demographics:

The City of Big Bear Lake has a population of approximately 5,269.

Male population - 1,998
Female population – 2,164
Median age (years) - 42.8
Under 6 years - 318
6 years to 16 years – 789
16 years and over – 4,162

White - 3,530
Black or African American - 63
American Indian and Alaska Native - 58
Asian - 58
Some other race - 137
Hispanic or Latino (of any race) – 1,423

Average household size - 2.3
Average family size - 2.8
Total housing units - 9,896
Occupied housing units - 2,250
Owner-occupied housing units - 1,238
Renter-occupied housing units – 1,012
Vacant housing units - 7,646
The Big Bear City Community Services District has a population of approximately 13,400.

Male population – 6,525
Female population – 6,875
Under 6 years – 1,031
6-16 years – 1,723
16 years and older – 10,658
Median age - 40

White – 11,400
Hispanic or Latino – 1,680
All others - 320

Average household size - 2.52
Average family size - 2.96
Total housing units - 9,240
Occupied housing units - 3,918
Owner occupied units - 2,917
Renter occupied units - 1,001
Vacation housing units - 5,322

5. Economy:

In labor force (population 16 years and over) – 2,859

Average travel time to work in minutes (population 16 years and over) - 22.55

Median household income (dollars) - 48,529
Median family income (dollars) - 60,060
Per capita income (dollars) - 29,251

Families below poverty - 179
Individuals below poverty level - 796

The above-referenced data was obtained from U.S. Census Bureau "FactFinder" 2013-2017 American Community Survey 5-Year Estimates and statistical information from the 2018 Southern California Association of Governments "Local Profiles Report 2019" specific to the City of Big Bear Lake.

6. Industry:

Tourism is the primary industry in the Big Bear Valley, creating full-time and part-time jobs for local residents. The San Bernardino Mountains play host to more than five million visitors annually. These visitors are predominantly part-time homeowners, friends, guests, and travelers from Southern California.

The most common industries / occupations are:

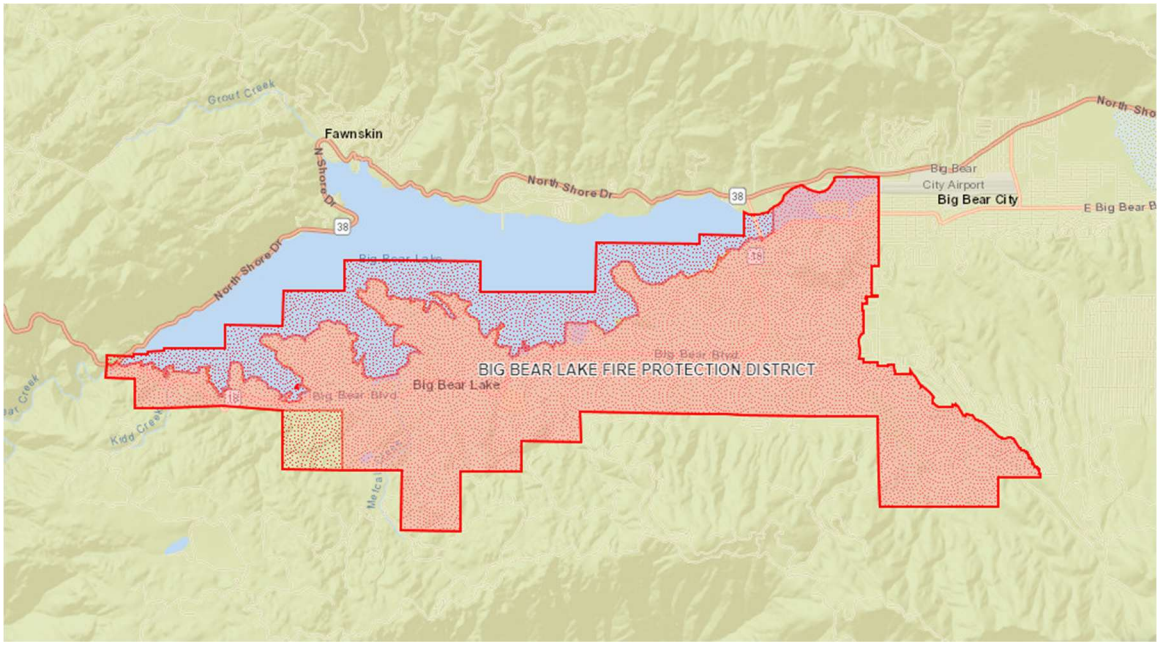
Males:
- Construction (19%)
- Accommodation and food services (18%)
- Public administration (9%)
- Educational services (7%)
- Arts, entertainment, and recreation (4%)
- Food and beverage stores (4%)
- Building material and garden equipment and supplies dealers (3%)

Females:
- Accommodation and food services (20%)
- Educational services (10%)
- Real estate and rental and leasing (9%)
- Health care (7%)
- Food and beverage stores (6%)
- Professional, scientific, and technical services (6%)
- Administrative and support and waste management services (5%)

1.4 Land Uses and Development Trends

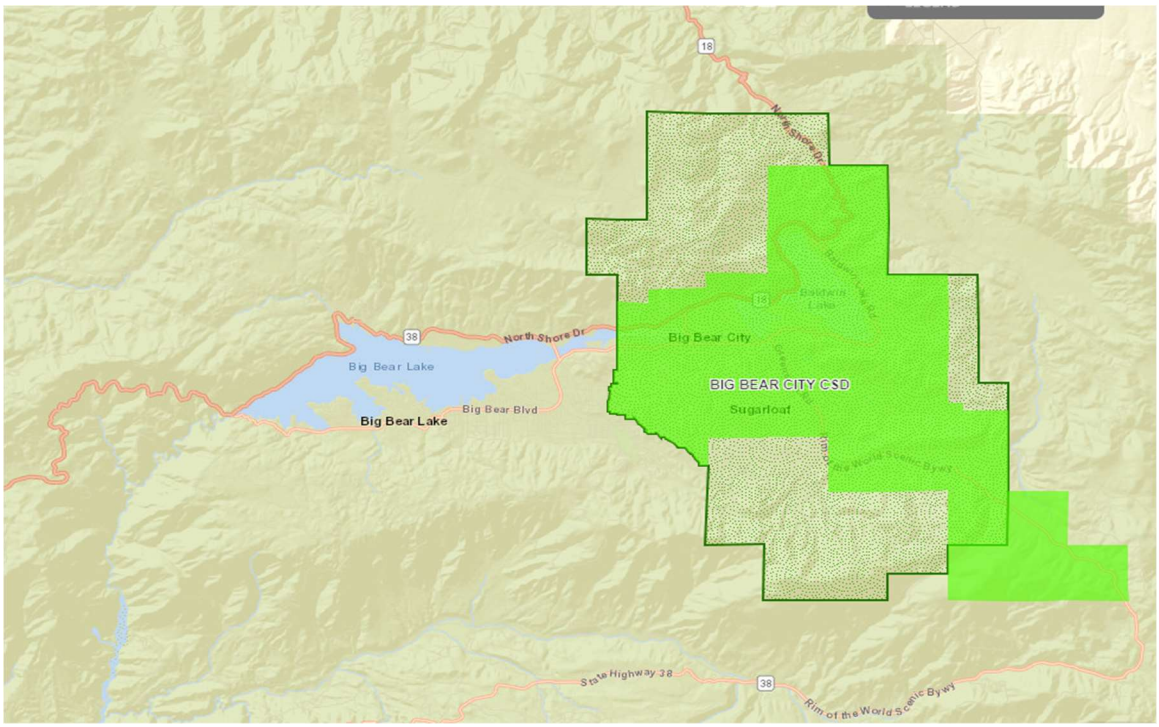
City of Big Bear Lake:

The City of Big Bear Lake encompasses approximately 7.0 square miles designated for a broad range of land uses, including residential, commercial, and industrial designations. 2,665 acres are zoned for single-family and multi-family development and 1,262 acres are zoned for commercial, industrial, public space and open space use. Roads occupy 518 acres of the City area. Existing residential, commercial and industrial developments occupy approximately 75% of the acreage identified above. There are no undeveloped parcels that would allow for any type of large scale development within the City. Future development will consist of small to moderately sized infill projects. Between 1990 and 2010, the City experienced a population growth rate of only 0.8%, ranking it 47th out of 48 cities in the Inland Empire. It is anticipated that the upcoming 2020 Census will identify a very similar to negligible population growth rate for the period from 2010 to 2020.



Big Bear City Community Services District:

The Big Bear City Community Services District encompasses 21.13 square miles that is bordered on the south, north and east by the San Bernardino National Forest, and bordered on the west by the City of Big Bear Lake. Approximately 85% is zoned for single-family and multi-family development and approximately 15% is zoned for commercial, industrial, public space and open space use. Future development will likely consist of small to moderately sized projects.



Section 2 - Jurisdiction Information

2.1 Adoption by local governing body

Primary Point of Contact

The Point of Contact for information regarding this plan is:

Mike Maltby
Asst. Fire Chief – Fire Marshal
Big Bear Fire Authority
P.O. Box 2830
Big Bear Lake, CA 92315
(909) 866-7566 (Office)
mmaltby@bigbearfire.org

Phil Mosley
Director of Community Services/
Deputy Director of Emergency Services
P.O. Box 10,000
Big Bear Lake, CA 92315
(909) 752-2892 (Office)
pmosley@citybigbearlake.com

Promulgation Authority Information

This Hazard Mitigation Plan was reviewed and approved by the following Promulgation Authorities:

Big Bear Lake Fire Authority/Big Bear Community Services District and the City of Big Bear Lake

Description of Involvement: Plan review & approval

Contact Information:

Big Bear Fire Authority
P.O. Box 2830
Big Bear Lake, CA 92315
(909) 866-7566

City of Big Bear Lake
P.O. Box 10,000
Big Bear Lake, CA 92315
(909) 866-5831

Fire Authority Board (ten members consisting of the Big Bear Lake City Council and the Big Bear City Community Services District Board of Supervisors)
Governing Board of the Big Bear Fire Authority
Description of Involvement*:* Plan review & approval
Contact Information:
41090 Big Bear Boulevard
Big Bear Lake, CA 92315
(909) 866-7566

City of Big Bear Lake (Five member City Council)
Description of Involvement*:* Plan review & approval
Contact Information:
39707 Big Bear Boulevard
Big Bear Lake, CA 92315
(909) 866-5831

2.2 Multi-Jurisdictional plan adoption

Once all requisite State, and Federal approvals have been achieved, the Fire Authority's Hazard Mitigation Plan will be brought before the Big Bear Lake City Council and the Big Bear Community Services District Board for adoption.

Section 3 - Planning Process Documentation and Public Involvement

3.1 Planning Team Member Information

This Hazard Mitigation Plan was reviewed, discussed and updated by members of the following Planning Team:

Phil Mosley
Director of Community Services/Deputy Director of Emergency Services – City of Big Bear Lake

Contact Information:
City of Big Bear Lake
39707 Big Bear Boulevard, P. O. Box 10000
Big Bear Lake, CA 92315-8900
(909) 866-5831
pmosley@citybigbearlake.com

Mary Reeves
General Manager – Big Bear City Community Services District

Contact Information:
Big Bear City Community Services District
P. O. Box 558
Big Bear City, CA 92314
(909) 585-2565
mreeves@bbccsd.com

Mike Maltby
Assistant Fire Chief/Fire Marshal – Big Bear Fire Authority

Contact Information:
Big Bear Fire Authority
P.O. Box 2830
Big Bear Lake, CA 92315
(909) 866-7566
mmaltby@bigbearfire.org

This Hazard Mitigation Plan also includes data and update information provided during the review and discussion of this plan by a Big Bear Valley Multi-Jurisdictional/Agency Planning Team comprised of the following jurisdictions and agencies:

City of Big Bear Lake (Phil Mosley, Deputy Director of Emergency Services), Big Bear City Community Services District (Mary Reeves, General Manager), City of Big Bear Lake Department of Water and Power (Sierra Orr, Water Conservation and Public Information Supervisor), Bear Valley Unified School District (Shelli Black, Executive Assistant to the Superintendent), San Bernardino County Sheriff's Department (Lt. Ryan Collins), Municipal Water District (Tim Bowman, Facilities Manager-Lake Management), Big Bear Valley Mountain Mutual Aid Association (General Membership and Board), Big Bear Airport District (Ryan Gross, Operations and Maintenance Manager), Southwest Gas Corp. Durst, Operations Supervisor), Bear Valley Electric Corporation (Paul Marconi, General Manager).

3.2 Multi-Jurisdictional Planning Team Information

The Hazard Mitigation Plan update prepared by the County of San Bernardino Office of Emergency Services includes the Big Bear City Community Services District and Big Bear Fire Authority jurisdictional areas outside of the City of Big Bear Lake's jurisdictional boundaries. The County MJHMP update was approved by FEMA on July 13, 2017.

Contact Information:

San Bernardino County Fire Department, Office of Emergency Services
1743 Miro Way
Rialto, CA 92376
(909) 356-3998

3.3 Public Involvement Items

Public Involvement consisted of the following items:

Big Bear Valley Mountain Mutual Aid Association
On-going Bi-Monthly Meetings

Topics of discussion included and will continue to include:

- On going hazard mitigation projects of the City, CSD, Fire Authority, County of San Bernardino and our local utility companies
-Disaster Mitigation Act of 2000 and mitigation project planning for compliance with this act
-Plan update process
-Public involvement
-Hazard identification
-Examples of existing mitigation efforts

BBVMMAA members (which include individual members of each of the Planning Team agencies identified in Section 3.1 above) in attendance at these bi-monthly meetings provide individual reports on the current status of the activities of their agency or organization. These reports include any response their agency or organization provided in addressing a recent natural hazard event and input as to how effective existing mitigation measures were during the event and recommendation regarding implementing potential mitigation measures to address the natural hazard prior to a recurrence in the future. Copies of past meeting agendas and meeting minutes attached as Appendix H.

Location:
Civil Air Patrol/Valley Wide EOC

100 W. Meadow Lane
Big Bear City, CA 92314

Public Input

January 2020

Description: This updated LHMP was posted on the City's website and public service announcements were made on our local radio station KBHR 93.3 requesting public review and comment. Additionally, public announcements were made regarding this update and posting of the draft document on the City's website at both City Council meetings in January 2020, which included requests for public input on the document.

Section 4 - Risk Assessment

The goal of mitigation is to reduce the future impacts of a hazard including property damage, disruption to local and regional economies, and the amount of public and private funds spent to assist with recovery; however, mitigation should be based on risk assessment.

A risk assessment is measuring the potential loss from a hazard event by assessing the vulnerability of buildings, infrastructure and people. It identifies the characteristics and potential consequences of hazards, how much of the community could be affected by a hazard, and the impact on community

assets. A risk assessment consists of three components: hazard identification, vulnerability analysis and risk analysis. Technically, these are three different items, but the terms are sometimes used interchangeably.

4.1 Hazard Identification

The following table represents the Critical Priority Risk Index for each hazard facing the community.

Hazard	Probability	Magnitude/ Severity	Warning Time	Duration	Priority Risk Index
Wildfires	High Likely	Catastrophic	Less 6 Hours	More than one week	4
Infestation	High Likely	Catastrophic	24+ Hours	More than one week	3.55
Drought	High Likely	Critical	24+ Hours	More than one week	3.25
Earthquake	Likely	Critical	Less 6 Hours	Less than 6 hours	2.95
Winter Storms	Likely	Critical	12-24 Hours	Less than one week	2.85
Lightning	High Likely	Limited	12-24 Hours	Less than 6 hours	2.8
Severe Thunderstorm	High Likely	Limited	12-24 Hours	Less than 6 hours	2.8
High Winds/Straight Line Winds	Likely	Limited	12-24 Hours	Less than one week	2.55
Flooding	Possible	Limited	Less 6 Hours	Less than 6 hours	2.95
Flash Flooding	Possible	Limited	12-24 Hours	Less than 6 hours	1.9

The following is a list of each hazard/threat confronting the Big Bear Valley.

Natural Hazards

1. Drought

General Definition:

A drought is a period of drier-than-normal conditions that results in water-related problems. Precipitation (rain or snow) falls in uneven patterns across the country. When no rain or only a small amount of rain falls, soils can dry out and plants can die. When rainfall is less than normal for several weeks, months, or years, the flow of streams and rivers declines, water levels in lakes and reservoirs fall, and the depth to water in wells increases.

If dry weather persists and water supply problems develop, the dry period can become a drought. The first evidence of drought usually is seen in records of rainfall. Within a short period of time, the amount of moisture in soils can begin to decrease. The effects of a drought on flow in streams and rivers or on water levels in lakes and reservoirs may not be noticed for several weeks or months. Water levels in wells may not reflect a shortage of rainfall for a year or more after the drought begins.

A period of below-normal rainfall does not necessarily result in drought conditions. Some areas of the United States are more likely to have droughts than other areas. In humid, or wet, regions, a drought of a few weeks is quickly reflected in a decrease in soil moisture and in declining flow in streams. In arid or dry regions, people rely on ground water and water in reservoirs to supply their needs. They are protected from short-term droughts, but may have severe problems during long dry periods because they may have no other water source if wells or reservoirs go dry.

Description: Seven years of drought (commencing in the 1999/2000 winter season) and exacerbated by the driest and warmest period in recorded history (January 2003) dramatically impacted large stands of trees in and around the City of Big Bear Lake. Drought is the predominant stressor, weakening trees and allowing pathogens such as Bark Beetles, root rot, and mistletoe to kill not only young trees, but old growth trees as well. Additionally, brush and chaparral have lower moisture content, contributing to a higher dead to live fuel ratios and mortality.

Historical Profile: The San Bernardino Mountains experiencing seven (7) years of drought. Precipitation was less than half of normal over this time period. Even though annual precipitation levels have been at or above normal over the past three winter seasons, the severity and duration of the previous drought conditions has resulted in lingering effects to trees and vegetation, which continues to provide for below normal fuel moisture in live fuels from spring through fall, increasing the fire hazard in this area. Approximately 350,000 acres in and around the San Bernardino National Forest have experienced significant mortality in timber and brush.

2. Earthquake

General Definition:

An earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth as the huge plates that form the Earth's surface move slowly over, under, and past each other. Sometimes the movement is gradual. At other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet; however, some earthquakes occur in the middle of plates.

Ground shaking from earthquakes can collapse buildings and bridges; disrupt gas, electric, and phone service; and sometimes trigger landslides, avalanches, flash floods, fires, and huge, destructive ocean waves (tsunamis). Buildings with foundations resting on unconsolidated landfill and other unstable soil, and trailers and homes not tied to their foundations are at risk because they can be shaken off their mountings during an earthquake. When an earthquake occurs in a populated area, it may cause deaths and injuries and extensive property damage.

Earthquakes strike suddenly, without warning. Earthquakes can occur at any time of the year and at any time of the day or night. On a yearly basis, 70 to 75 damaging earthquakes occur throughout the world. Estimates of losses from a future severe earthquake in the United States approach $200 billion. There are 45 states and territories in the United States at moderate to very high risk from earthquakes, and they are located in every region of the country. California experiences the most frequent damaging earthquakes; however, Alaska experiences the greatest number of large earthquakes—

most located in uninhabited areas. The largest earthquakes felt in the United States were along the New Madrid Fault in Missouri, where a three-month long series of quakes from 1811 to 1812 included three quakes larger than a magnitude of 8 on the Richter scale. These earthquakes were felt over the entire Eastern United States, with Missouri, Tennessee, Kentucky, Indiana, Illinois, Ohio, Alabama, Arkansas, and Mississippi experiencing the strongest ground shaking.

Description: The City of Big Bear Lake is in close proximity to several major earthquake faults.

Historical Profile: Many major earthquakes, greater than 5.5 magnitude, have struck in Southern California since the mid 1800's: San Jacinto, April 21, 1918; Whittier Narrows, October 1987; Big Bear/Lander's, June 28, 1992; Northridge, January 17, 1994; and the Ridgecrest earthquakes, July 4 & 5, 2019.

All of the above-referenced earthquakes were in close proximity to the San Bernardino Mountain Range.

3. Flash Flooding

General Definition:

Flash flooding is a sudden flood of great volume, usually caused by a heavy rain.

Historical Profile: The City of Big Bear Lake and the CSD experience isolated areas of flash flooding during a torrential rainfall incident on February 14, 2019.

4. Flooding

General Definition:

Floods are the most common and widespread of all natural disasters--except fire. Most communities in the United States have experienced some kind of flooding, after spring rains, heavy thunderstorms, or winter snow thaws.

A flood, as defined by the National Flood Insurance Program is: "A general and temporary condition of partial or complete inundation of two or more acres of normally dry land area or of two or more properties (at least one of which is your property) from:

*Overflow of inland or tidal waters,*Unusual and rapid accumulation or runoff of surface waters from any source, or a mudflow. The collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood.
Floods can be slow or fast rising but generally develop over a period of days. Mitigation includes any activity that prevents an emergency, reduce the chance of an emergency happening, or lessen the damaging effects of unavoidable emergencies. Investing in mitigation steps now, such as, engaging in floodplain management activities, constructing barriers, such as levees, and purchasing flood insurance will help reduce the amount of structural damage to your home and financial loss from building and crop damage should a flood or flash flood occur.
Flooding tends to occur in the summer and early fall because of the monsoon and is typified by increased humidity and high summer temperatures.

The standard for flooding is the so-called "100-year flood," a benchmark used by the Federal Emergency Management Agency to establish a standard of flood control in communities throughout the country. Thus, the 100-year flood is also referred to as the "regulatory" or "base" flood.

Actually, there is little difference between a 100-year flood and what is known as the 10-year flood. Both terms are really statements of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. In fact, the 500-year flood and the 10-year flood are only a foot apart on flood elevation-which means that the elevation of the 100-year flood falls somewhere in between. The term 100-year flood is often incorrectly used and can be misleading. It does not mean that only one flood of that size will occur every 100 years.

What it actually means is that there is a one percent chance of a flood of that intensity and elevation happening in any given year. In other words, it is the flood elevation that has a one percent chance of being equaled or exceeded each year and it could occur more than once in a relatively short period of time. By comparison, the 10-year flood means that there is a ten percent chance for a flood of its intensity and elevation to happen in any given year. Rod Bolin, The Ponca City News, July 18, 2002, Page 5-A.

Description: There are low lying areas within the community that may be affected by runoff from flooding. Coupled with winter snow, plugging culverts and runoff areas, areas have potential for flooding, especially if the snow turns to rain as temperatures increase.

Historical Profile: Heavy rain years exceeding normal precipitation have contributed to flooding in the past. Additionally, thunderstorms which produce a significant amount of rain in a short period of time have also caused areas to flood.

5. High Winds/Straight Line Winds

General Definition:

High winds can result from thunderstorm inflow and outflow, or downburst winds when the storm cloud collapses, and can result from strong frontal systems, or gradient winds (high or low pressure systems) moving across the San Bernardino County mountain ranges. High winds are identified as having wind speeds reaching 50 mph or greater, either sustaining or gusting.

Historical Profile: The Big Bear Valley experiences high wind episodes annually. These episodes have resulted in isolated instances of minor to severe structure damage and electric utility interruption caused by fallen trees.

6. Infestation

General Definition:

Damage and destruction caused by infestation of a natural organism. This hazard can include problems caused by insects, virus, or any identifiable living organism. This hazard can be related to or caused by other natural hazards and may have residual effects beyond the issues directly related to the infestation.

Historical Profile: Bark Beetles are a part of nature; tree mortality from the Bark Beetle has been mild to moderate in the past. The impact of a 7 year drought resulted in nearly 100,000 acres of dead and dying trees within the San Bernardino National Forest, primarily due to Bark Beetle infestation. In conjunction with drought, years of “zero tolerance” fire prevention practices and extremely prohibitive tree removal regulations have led to overstocking of trees, which increased competition for severely limited water resources and thereby increased their vulnerability to infestation.

7. Lightning

General Definition:

Lightning is a discharge of atmospheric electricity, accompanied by a vivid flash of light, from a thunderstorm, frequently from one cloud to another, sometimes from a cloud to the earth. The sound produced by the electricity in passing rapidly through the atmosphere causes thunder.

Within the thunderstorm clouds, rising and falling air causes turbulence, which results in a buildup of a static charge. The negative charges concentrate in the base of the cloud. Since like charges repel, some of the negative charges on the ground are pushed down away from the surface, leaving a net positive charge on the surface. Opposite charges attract, so the positive and negative charges are pulled toward each other.

This first, invisible stroke is called a stepped leader. As soon as the negative and positive parts of the stepped leader connect there is a conductive path from the cloud to the ground and the negative charges rush down it causing the visible stroke.
Thunder is caused by the extreme heat associated with a lightning flash. In less than a second, the air is heated to 15,000 to 60, 000 degrees. When the air is heated to this temperature, it rapidly expands. When lightning strikes very close by, the sound will be a loud bang, crack or snap.

Thunder can typically be heard up to 10 miles away. During heavy rain and wind this distance will be less, but on quiet nights, when the storm is many miles away, thunder can be heard at longer distances.

8. Severe Thunderstorm

General Definition:

A severe thunderstorm is an electrical storm, accompanied by heavy rain.

Historic Profile: There is an annual potential for severe thunderstorm activity. Generally, the greatest potential for severe thunderstorm activity is during the time period of late July through late August.

9. Wildfires

General Definition:

There are three different classes of wild land or wildfires. A surface fire is the most common type and burns along the floor of a forest, moving slowly and killing or damaging trees. A ground fire is usually started by lightning and burns on or below the forest floor. Crown fires spread rapidly by wind and move quickly by jumping along the tops of trees.

Wildfires are usually signaled by dense smoke that fills the area for miles around. Wildfires present a significant potential for disaster in the southwest, a region of relatively high temperatures, low humidity, and low precipitation during the summer, and during the spring, moderately strong daytime winds. Combine these severe burning conditions with people or lightning and the stage is set for the occurrence of large, destructive wildfires.

Description*:* Because the City is surrounded by National Forest, the threat of wildfire is of particular concern to the community.

Historical Profile: The San Bernardino Mountains have experienced numerous wildfires over the past two decades: Panorama Fire, 11/25/1980; Mill Fire, 09/01/1997; Willow Fire, 08/29/1999; Hemlock Fire, 06/14/2001; Arrowhead Fire, 06/14/2003; Bridge Fire, 09/05/2003 and the Old Fire, 10/25/2003.

10. Winter Storms

General Definition:

A winter storm can range from moderate snow over a few hours to blizzard conditions with high winds, freezing rain or sleet, heavy snowfall with blinding wind-driven snow and extremely cold temperatures that lasts several days.

Some winter storms may be large enough to affect several states while others may affect only a single community. All winter storms are accompanied by cold temperatures and blowing snow, which can severely reduce visibility. A severe winter storm is one that drops 4 or more inches of snow during a 12 –hour period, or 6 or more inches during a 24 hour span.

An ice storm occurs when freezing rain falls from clouds and freezes immediately on impact. All winter storms make driving and walking extremely hazardous. The aftermath of a winter storm can impact a community or region for days, weeks, and even months.

Storm effects such as extreme cold, flooding, and snow accumulation can cause hazardous conditions and hidden problems for people in the affected area. People can become stranded on the road or trapped at home, without utilities or other services. Residents, travelers and livestock may become isolated or stranded without adequate food, water and fuel supplies.

The conditions may overwhelm the capabilities of a local jurisdiction. Winter storms are considered deceptive killers as they indirectly cause transportation accidents, and injury and death resulting from exhaustion/overexertion, hypothermia and frostbite from wind chill, and asphyxiation; house fires occur more frequently in the winter due to lack of proper safety precautions.

"Wind chill" is a calculation of how cold it feels outside when the effects of temperature and wind speed are combined. On November 1, 2001, the National Weather Service (NWS) implemented a replacement Wind Chill Temperature (WCT) index for the 2001/2002 winter season. The reason for the change was to improve upon the current WCT Index, which was based on the 1945 Siple and Passel Index.

A winter storm watch indicates that severe winter weather may affect your area. A winter storm warning indicates that severe winter weather conditions are definitely on the way. A blizzard warning means that large amounts of falling or blowing snow and sustained winds of at least 35 miles per hour are expected for several hours.

Historic Profile: During a 72 hour period commencing on the morning of January 20, 2010 and ending on the morning of January 23, 2010, a series of severe winter storm systems moved through the San Bernardino Mountains resulting in snow fall accumulation within the City ranging in depth from sixty inches (60”) to (72”). Numerous structural collapses occurred, numerous power outages occurred (some lasting up to 7 days), and the ability to replenish dwindling food and gasoline supplies became a concern due to severely restricted or impassable roads into, throughout and out of the City.

4.2 Hazard Profile

The CPRI factors the elements of risk: Probability (P), Magnitude/Severity (M), Warning Time (WT) and Duration to create an index which allows for the prioritization of mitigation activities based on the level of risk. The following hazards are listed in order of decreasing CPRI score.

Natural Hazards

Drought

The San Bernardino Mountains has experienced two significant periods of drought in the past 20 years. The first being a seven year period extending seven (7) years between 1998 and 2004 and the second being a five year period extending between 2012 and 2017. Community impacts include restrictions on outdoor watering, limitations on the issuance of building permits, and a significant increase in tree mortality. Drought effects within the Big Bear City Community Services District area is addressed in 4.16 of the County of San Bernardino's MJHMP 2017 update.

Calculated Priority Risk Index (CPRI)

Probability: **4 Highly Likely**

Magnitude/Severity: **3 Critical**

Warning Time: **1 24+ Hours**

Duration: **4 More than one week**

The CPRI for the Drought hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

4 x .45 + **3** x .30 + **1** x .15 + **4** x .10 = **3.25**

Earthquake

The Big Bear area was impacted by two earthquakes on June 28, 1992. The Lander's Earthquake, centered 6 miles north of Yucca Valley, occurred at 4:57 am PDT and registered 7.3 on the Richter scale.

The Big Bear area was impacted by a second earthquake on June 28, 1992. The Big Bear Earthquake occurred at 8:05 am PDT, was centered 5 miles southeast of Big Bear Lake and registered 6.4 on the Richter scale.

While the July 4th and 5th 2019 Ridgecrest earthquakes garnered a significant amount of local attention, they did not generate significant ground motion in the Big Bear Area and did not result in any noticeable impacts within the Big Bear Valley.

Earthquake risk assessment information pertinent to the entire Big Bear Valley is provided in Section 4.13 of the County of San Bernardino MJHMP 2017 update.

Calculated Priority Risk Index (CPRI)

Probability: **3 Likely**

Magnitude/Severity: **3 Critical**

Warning Time: **4 Less 6 Hours**

Duration: **1 Less than 6 hours**

The CPRI for the Earthquake hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

3 x .45 + **3** x .30 + **4** x .15 + **1** x .10 = **2.95**

Flash Flooding

The Big Bear Valley experienced a flash flood event on February 14, 2019 which affected areas within the City of Big Bear Lake and Big Bear City. While there was a significant amount of private property damage, the damage was minor to moderate in nature and did not result in the loss of any residential structure. The damage to public infrastructure was significant, resulting in over $250,000 in damage to road ways and sanitary sewer facilities. Additionally, a portion of State Highway 18 between Snow Valley and Green Valley Lake washed out and was impassible for several weeks. This resulted is some loss of local business revenue.

Calculated Priority Risk Index (CPRI)

Probability: **2 Possible**

Magnitude/Severity: **2 Limited**

Warning Time: **1 Less than 6 Hours**

Duration: **1 Less than 6 hours**

The CPRI for the Flash Flooding hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

2 x .45 + **2** x .30 + **2** x .15 + **1** x .10 = **2.95**

Flooding

The City of Big Bear Lake experienced a single-day period of isolated flooding on January 11, 2005. A moderate snow event was immediately followed by a heavy rain event, which resulted in significant storm water flows being redirected by snow and ice dams into areas that did not normally receive storm water flows. Significant damage to Menlo Drive occurred when storm water flows crossed over the street and resulted in the washout of the down sloping side of the roadway. The resulting mud-flow/subsidence left Menlo Drive impassible, one residential structure destroyed and four other residential structures significantly damaged. Additionally, storm water inundations of a number of residential and commercial buildings resulted in storm water damage in the minor to moderate range. Rough damage estimates put the recovery/reconstruction costs associated with this flooding event in excess of $3,000,000. Flooding in the Big Bear Community Service District area is addressed in Section 4.15 of the County of San Bernardino's MJHMP 2017 update.

Calculated Priority Risk Index (CPRI)

Probability: **2 Possible**

Magnitude/Severity: **2 Limited**

Warning Time: **2 12-24 Hours**

Duration: **1 Less than 6 hours**

The CPRI for the Flooding hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

2 x .45 + **2** x .30 + **2** x .15 + **1** x .10 = **1.9**

High Winds/Straight Line Winds

Winter storm events generally produce strong winds that can gust as high as 80 miles per hour. General concerns relating to these wind events relate to interruption of electrical service and roadway obstruction due to fallen trees. The storm event of February 14, 2019 produced both significant rain fall and high winds. Several structures were significantly damaged by fallen trees during this event, resulting in estimated property and business losses exceeding $3,000,000. High wind events in the Big Bear Community Service District area are generally addressed in Section 4.9 of the County of San Bernardino's MJHMP 2017 update.

Calculated Priority Risk Index (CPRI)

Probability: **3 Likely**

Magnitude/Severity: **2 Limited**

Warning Time: **2 12-24 Hours**

Duration: **3 Less than one week**

The CPRI for the High Winds/Straight Line Winds hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

3 x .45 + **2** x .30 + **2** x .15 + **3** x .10 = **2.55**

Infestation

Various species of the "bark beetle" are always present within the City of Big Bear Lake and Big Bear City forest areas and the surrounding National Forest areas. Infestations of this parasite occur during extended drought periods and in densely treed areas where trees are stressed due to over competition for limited water resources. Pine tree mortality within the Big Bear Valley has been light to moderate during the past 20 years, but has not resulted in a harmful decline in the Big Bear Valley tree population during this time period. High wind events in the Big Bear Community Service District area are generally addressed in Section 4.9 of the County of San Bernardino's MJHMP 2017 update.

Calculated Priority Risk Index (CPRI)

Probability: **4 Highly Likely**

Magnitude/Severity: **4 Catastrophic**

Warning Time: **1 24+ Hours**

Duration: **4 More than one week**

The CPRI for the Infestation hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

4 x .45 + **4** x .30 + **1** x .15 + **4** x .10 = **3.55**

Wildfires

Holcomb Fire, *San Bernardino and east end of Big Bear City*, 6/19/17, originated northeast of Big Bear City, **Old Fire**, *San Bernardino*, 10/25/03, originated ¼ mile north of Arrowhead Springs on Waterman Canyon Road; **Bridge Fire**, *Running Springs,* 09/05/03, broke out along the west side of State Highway 330; **Arrowhead Fire,** *San Bernardino,* 05/31/02, started next to Arrowhead Springs Hotel at the base of State Highway 18; **Hemlock Fire**, *Running Springs,* 06/14/2001, fire escaped from a prescribed burn on the south side of Running Springs and burned to the Keller Peak Fire Lookout Tower.; **Willow Fire**, *Lake Arrowhead,* 08/29/1999, fire made its way from Lake Arrowhead to Big Bear Valley in a matter of days; **Mill Fire**, *Running Springs, 09/01/1997; and the* **Panorama Fire**, *Crestline, 11/25/1980.*

As witnessed by the number of events above and the devastating wildfires that ravaged Northern California in 2018 and 2019, Wildfire poses the most significant risk to the Big Bear Valley.

Calculated Priority Risk Index (CPRI)

Probability: **4 Highly Likely**

Magnitude/Severity: **4 Catastrophic**

Warning Time: **4 Less 6 Hours**

Duration: **4 More than one week**

The CPRI for the Wildfires hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

4 x .45 + **4** x .30 + **4** x .15 + **4** x .10 = **4**

Winter Storms

Three winter storm events have resulted in significant impacts to the City of Big Bear Lake and to a slightly lesser degree the Big Bear City area. The impacts of the flash flood and flood events of 2019 and 2005 are described in those specific sections above. Additionally, the Big Bear Valley as a whole received anywhere from 60" to 72" of snow during a 72 hour period extending from January 13 to January 16, 2010. During this period, extreme measures were implemented to address issues associated with blocked roadways, downed power lines and potential and actual structural collapse due to roof top snow accumulations. Costs associated with property/structure damage and emergency responses relating to this even exceeded $2,000,000.

Calculated Priority Risk Index (CPRI)

Probability: **3 Likely**

Magnitude/Severity: **3 Critical**

Warning Time: **2 12-24 Hours**

Duration: **3 Less than one week**

The CPRI for the Winter Storms hazard for the Big Bear area is:

Probability + Magnitude/Severity + Warning Time + Duration = CPRI

3 x .45 + **3** x .30 + **2** x .15 + **3** x .10 = **2.85**

Terrorism

As documented in Section 4.7.3 of the County of San Bernardino's MJHMP 2017 update, there have been two events identified as terrorist attacks in San Bernardino County. Neither of these events occurred within or near the Big Bear Valley. Due to our somewhat isolated location, limited access points, low population density and lack of significant terrorist targets, the probability of a terrorist attack within the Big Bear Valley is rated as extremely low.

Climate Change

The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the stat's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

The effects of climate change are varied: warmer and more varied weather patterns, melting ice caps, and poor air quality for example. As a result, climate change impacts a number of natural hazards.

4.3 Vulnerability Assessment

4.3.1 Asset Inventory

4.3.1.1 Community Asset Overview

This section provides an overview of the assets in the Big Bear area.

Civic Center, 39707 Big Bear Boulevard, Phil Mosley (contact person), (909) 866-5831 (office), (909) 633-6428 (after hours)

Big Bear City Community Services District, 139 E. Big Bear Boulevard, Mary Reeves (contact person) (909) 585-2565

Department of Water and Power, 41972 Garstin Drive, Reggie Lamson (contact person), (909) 866-5050 (office), (909) 584-2962 (after hours)

Municipal Water District, 40524 Lakeview Drive, Mike Stevenson (contact person), (909) 866-5796

Big Bear Fire Authority Headquarters/Station 281, 41090 Big Bear Boulevard, Jeff Willis (contact person), (909) 866-7566 (office)

Big Bear Fire Authority Station 282, 301 W. Big Bear Boulevard, Jeff Willis (contact person), (909) 866-7566 (Station 281 office)

Big Bear Fire Authority Station 283, 550 N Maple Lane, Jeff Willis (contact person), (909) 866-7566 (Station 281 office)

Big Bear Fire Authority Station 284

Big Bear Lake Public Works Division, 42040 Garstin Drive, John Harris (contact person), (909) 866-6831 (office)

Big Bear City Community Services District, Paradise Maintenance Yard, 417 Grenfall Lane, Mary Reeves (contact person) (909) 585-2565

San Bernardino County Sheriff's Department, Big Bear Lake Division, 477 Summit Boulevard, Captain Mitch Dattilo (contact person), (909) 866-0100 (office), (909) 866-7581 (after hours, general public), (909) 356-3854 (after hours, supervisor only)

Bear Valley Community Hospital, 41870 Garstin Drive, John Friel (contact person), (909) 878-8247 (office)

Big Bear Recreation and Park District, 41220 Park Avenue, Reese Troublefield (contact person), (909) 866-9700 (office)

Big Bear City Airport, 501 W. Valley Blvd., Jack Roberts (contact person) (909) 585-3219

Bear Valley Unified School District, 42271 Moonridge Road, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Big Bear Elementary School, 40940 Pennsylvania Avenue, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Big Bear Middle School, 41275 Big Bear Boulevard, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Big Bear High School, 351 N. Maple Lane, Sugarloaf, CA 92386, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Baldwin Lane Elementary School, 44500 Baldwin Lane, Sugarloaf, CA 92386, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Bear Valley Electric, 42020 Garstin Drive, Paul Marconi (contact person), (909) 866-4678, extension 100 (office)

Chautauqua High School, 525 N. Maple Lane, Sugarloaf, CA, 92386, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Southwest Gas Company, 40844 Big Bear Boulevard, Sam Pond (contact person), (760) 951-4030 (office), (800) 867-9091 (after hours)

Big Bear Area Regional Wastewater Agency, 121 Palomino Drive, Big Bear City, David Lawrence contact person), (909) 684-4521 (office), (909) 585-3125 (after hours)

Big Bear Disposal, 41974 Garstin Drive, Steve Galante (contact person), (909) 866-3942 (office), (909) 709-6113 (after hours), (909) 709-6113 (cell phone)

4.3.1.2 Critical Facility List

Critical Facilities in City of Big Bear Lake:

Civic Center, 39707 Big Bear Boulevard, Phil Mosley (contact person), (909) 866-5831 (office), (909) 633-6428 (after hours)

Facility Description: The Civic Center building containing the City Manager's Office, City Clerk's Office, Building & Safety Division, Code Compliance Division, Engineering Division, Film Office, Finance Division, MIS, Human Resources, Planning Division, and Performing Arts Center Auditorium.

Department of Water and Power, 41972 Garstin Drive, Reggie Lamson (contact person), (909) 866-5050 (office), (909) 584-2962 (after hours)

Facility Description: The Department of Water and Power provides domestic water service and fire flows to approximately 15,000 residential and commercial customers including the entire City of Big Bear Lake, Moonridge, Sugarloaf, the northern half of Erwin Lake, Lake Williams, Fawnskin, portions of Whispering Forest, and Rim Forest (near Lake Arrowhead. Key components of the water system include adequate source capacity (wells). and storage capacity (reservoirs) to meet peak holiday weekend demands; replacement of old leaky, undersized steel mainlines to provide adequate fire flow; and ongoing/recurring rehabilitation of older system components (buildings, reservoirs, pumps, motors, etc.) to assure reliable service.

Municipal Water District, 40524 Lakeview Drive, Mike Stephenson (contact person), (909) 866-5796

Big Bear Fire Authority Headquarters/Station 281, 41090 Big Bear Boulevard, Jeff Willis (contact person), (909) 866-7566

Facility Description: The Big Bear Fire Authority provides an all-risk/full service organization which serves and protects the community through public education, fire prevention, fire suppression, emergency rescue, disaster preparedness, and other services in order to minimize the loss of life and property, damage to the environment, and adverse economic impacts due to natural or human-made emergencies or events. The District's boundaries currently incorporate approximately nine square miles with a current annual call volume of approximately 4,200.

Public Works Division, 42040 Garstin Drive, John Harris (contact person), (909) 866-5831 (office)

Facility Description: The Public Works Street Maintenance Division manages and maintains approximately 90 miles of roadway within the City limits and assures use of proper traffic control methods, proper signage, flow-lines, tree trimming, drainage, pothole repair, striping, snowplowing, and cindering.

The Public Works Village Maintenance District provides for street, sidewalk, and lighting improvements within the Village. Properties within district boundaries that specifically benefit from the improvements pay an annual assessment based on front footage. City staff maintains the lighting systems and overhead signs; and provides maintenance and upkeep of the planters, including trees, shrubs, flowers, weed control, and the irrigation system in the Village.

The Public Works Sanitation Division services 8,300 properties providing for the collection and transportation of wastewater to the Big Bear Area Regional Wastewater Agency facility.

San Bernardino County Sheriff's Department, Big Bear Division, 477 Summit Boulevard, Captain Mitch Dattilo (contact person), (909) 866-0100 (office), (909) 866-7581 (after hours, general public), (909) 356-3854 (after hours, supervisor only)

Facility Description: The San Bernardino County Sheriff's Department provides for criminal law and traffic enforcement throughout the Big Bear area. The Sheriff's Department also provides all required

administration, dispatch and clerical services. Specialized services such as homicide, narcotics, child crimes, aviation, crime lab, and crime prevention are provided. The Sheriff's Department maintains very robust volunteer forces, including Line Reserves, Search and Rescue, Horse Posse, and Citizens on Patrol.

Bear Valley Community Hospital, 41870 Garstin Drive, John Friel (contact person), 909.878.8247 (office)

Facility Description: Bear Valley Community Hospital maintains a 24-hour standby Emergency Department, Family Health Center, Laboratory, rural health clinic and skilled nursing facilities.

Bear Valley Unified School District, 42271 Moonridge Road, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Big Bear Elementary School, 40940 Pennsylvania Avenue, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Big Bear Middle School, 41275 Big Bear Boulevard, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Bear Valley Electric, 42020 Garstin Drive, Paul Marconi (contact person), (909) 866-4678, extension 100 (office)

Southwest Gas Company, 40844 Big Bear Boulevard, Sam Pond (contact person), (760) 951-4030 (office), (800) 867-9091 (after hours)

Big Bear Area Regional Wastewater Agency, 121 Palomino Drive, Big Bear City, David Lawrence (contact person), (909) 684-4521 (office), (909) 585-3125 (after hours)

BBARWA Lake Interceptor System

Facility Description: The Lake Interceptor system conveys sewage from the City of Big Bear Lake to the Big Bear Area Water Agency treatment plant and consists of the Lake Pump Station and approximately 5.63 miles of 16-inch diameter force main. The Lake Interceptor force main is mostly ductile iron pipe with a small section of PVC pipe.

Big Bear Disposal, 41974 Garstin Drive, Steve Galante (contact person), 909.866.3942 (office), 909.709.6113 (after hours), 909.709.6113 (cell phone) - Refuse removal and hauling

Critical facilities within the Big Bear Community Services District:

Big Bear Fire Authority Station 282, 301 W. Big Bear Boulevard, Jeff Willis (contact person), (909) 866-7566 (Station 281 office)

Big Bear Fire Authority Station 283, 550 N Maple Lane, Jeff Willis (contact person), (909) 866-7566 (Station 281 office)

Big Bear City Community Services District, 139 E. Big Bear Boulevard, Mary Reeves (contact person) (909) 585-2565

Big Bear City Community Services District, Paradise Maintenance Yard, 417 Grenfall Lane, Mary Reeves (contact person) (909) 585-2565

BBARWA Treatment Plant, 122 Palomino Drive, David Lawrence (contact person), (909) 584-4018

Facility Description: The Big Bear Area Regional Wastewater Agency treatment plant is located in the community of Big Bear City and encompasses approximately 93.5 acres of land (approximately 11.2 acres for treatment plant and 82.3 acres for storage pond and lake evaporation). The BBARWA treatment plant is responsible for treating the sewage flow from surrounding member agencies as well as accepting the septic waste from those residents and businesses that are not connected or served by the existing sewer system

The treatment plant utilizes a biological treatment process (extended aeration activated sludge) with a biological treatment capacity of 4.89 MGD and a hydraulic capacity of 10 MGD. The treatment plant consists of the following unit processes and equipment:

-Preliminary treatment that includes a mechanical bar screen backed up by a redundant manual bar screen for removal of rags and large debris, and a grit removal system including an aerated grit chamber and grit washer.
-Secondary sedimentation consisting of two 75-foot diameter clarifiers and one 90-foot diameter clarifier.
-Two chlorine contact balancing chambers with a capacity of 500,000 gallons in each chamber.
-Effluent storage pond (Horseshoe Storage Pond) with a capacity of 5.25 MG.
-Effluent pumping stations including the main effluent pump station with a capacity of 5.2 MGD and an auxiliary pump station with a total effluent pumping capacity of 9.2 MGD.
-Emergency effluent storage pond with a capacity of 10 MG.
Sludge processing, consisting of a dissolved air floatation sludge thickener and a belt filter press for sludge de-watering.

Big Bear High School, 351 N. Maple Lane, Sugarloaf, CA 92386, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

Baldwin Lane Elementary School, 44500 Baldwin Lane, Shelly Black (contact person), (909) 866-4631 (office), (909) 878-3263 (after hours)

4.3.1.3 Non-Critical Facility List

Not applicable

4.3.1.4 Individual Hazard Vulnerability Analysis

This section serves to identify each hazard confronting the community and its vulnerabilities to that hazard.

Natural Hazards

1. Drought

a. Population. Approximately 100 percent of the community's population is vulnerable.

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

2. Earthquake

a. Population. Approximately 100 percent of the community's population is vulnerable.

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

3. Flash Flooding

a. Population. Approximately 20 percent of the community's population is vulnerable.

b. Critical Facilities.

(1) Approximately 0 percent of the community's critical facilities are vulnerable.

4. Flooding

a. Population. Approximately 30 percent of the community's population is vulnerable.

b. Critical Facilities.

(1) Approximately 2 percent of the community's critical facilities are vulnerable.

(2) The specific critical facilities vulnerable in the Big Bear area are:

Big Bear Fire Authority, Station 281

City of Big Bear Lake Performing Arts/Civic Center

Verizon Microwave Station

5. High Winds/Straight Line Winds

a. Population. Approximately 100 percent of the community's population is vulnerable.

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

6. Infestation

a. Population. Approximately 100 percent of the community's population is vulnerable.

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

7. Wildfires

a. Population. Approximately 100 percent of the community's population is vulnerable.

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

8. Winter Storms

a. Population. Approximately 100 percent of the community's population is vulnerable.

b. Critical Facilities.

(1) Approximately 100 percent of the community's critical facilities are vulnerable.

4.3.2 Potential Loss Estimation

4.3.2.1 Facility Replacement Cost Estimation

This section describes the replacement costs and economic impacts from lost facilities:

City Hall
Government Facilities
39707 Big Bear Boulevard
Facility Replacement Cost: $10,549,212

Public Works Division
Government Facilities
42040 Garstin Road
Facility Replacement Cost: $783,555

Big Bear Fire Authority
Fire Stations
281 - 41090 Big Bear Boulevard
282 - 301 W. Big Bear Boulevard
283 - 550 S. Maple Lane
284 -
Facility Replacement Cost: $5,523,794

Department of Water and Power
Water and Sewer
41972 Garstin Road
Facility Replacement Cost: $1,261,814

Big Bear City Community Services District
Government Facilities
139 E. Big Bear Boulevard
Facility Replacement Cost: $1,362,906

Paradise Maintenance Facility
Government Facilities
417 Grenfall Lane
Facility Replacement Cost: $4,046,997

Bear Valley Community Hospital
Emergency Medical Care Facilities
41870 Garstin Road
Facility Replacement Cost: Unknown

San Bernardino County Sheriff's Department, Big Bear Division
477 Summit Boulevard
Facility Replacement Cost: Unknown

Big Bear Area Regional Wastewater Agency
Wastewater Treatment Facilities:
122 Palomino Drive
Facility Replacement Cost: Unknown

Replacement costs and economic impacts for lost facilities was gained from August 2018 CJPIA Property Insurance Program.

4.3.2.2 Individual Hazard Economic Loss Estimation

This section describes the potential losses due to each hazard confronting the community or jurisdiction:

Natural Hazards

1. Drought

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $250,000 Annually
b. The loss from damage to structures from this hazard is approximately $0
c. The following is a description of the estimated losses:
Cost of tree removal, planting of drought-resistant landscape, reduced sales tax revenues due to reduced lake level resulting in lower tourism numbers

Estimated costs of damage and economic losses associated with severe and prolonged drought resulting in significant tree mortality and subsequent potential wildfire event are difficult to determine but would certainly be in the 100's of millions of dollars.

2. Earthquake

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $Unknown
b. The loss from damage to structures from this hazard is approximately $75,000,000
c. The following is a description of the estimated losses:
Loss of critical facilities/equipment, relocation costs.

Estimated costs of damage and economic losses associated with a large magnitude earth quake event on the southern portion of the San Andreas fault are difficult to determine but would certainly be in the 100's of millions of dollars.

3. Flash Flooding/Flooding

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $1,000,000
b. The loss from damage to structures from this hazard is approximately $2,500,000
c. The following is a description of the estimated losses:
Relocation costs, building and infrastructure repairs, business losses associated with obstructed/impassible roadways

4. High Winds/Straight Line Winds

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $500,000
b. The loss from damage to structures from this hazard is approximately $1,000,000
c. The following is a description of the estimated losses:
Building and infrastructure repairs from fallen trees and loss of business due power outages

6. Infestation

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $50,000
b. The loss from damage to structures from this hazard is approximately $0
c. The following is a description of the estimated losses:
Annual cost of tree removal, planting of pest-resistant plants/trees

Estimated costs of damage and economic losses associated with a severe bark beetle infestation resulting in significant tree mortality and subsequent potential wildfire event are difficult to determine but would certainly be in the 100's of millions of dollars.

9. Wildfires

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $250,000
b. The loss from damage to structures from this hazard is approximately $75,000,000
c. The following is a description of the estimated losses:
Loss of critical facilities/equipment, relocation costs, loss of tourism

Estimated costs of damage and economic losses associated with a severe wildfire event, which may be amplified by significant tree mortality associated with a severe and prolonged drought event, are difficult to determine but would certainly be in the 100's of millions of dollars.

10. Winter Storms

Summary of Economic Losses

a. The economic loss resulting from this hazard is approximately $Unknown
b. The loss from damage to structures from this hazard is approximately $1,250,000
c. The following is a description of the estimated losses:
Weather-related building repair, repair of damage to street, sewer, storm water and electric utility facility infrastructure. Economic loss is difficult to determine as tourism and related business revenue losses would be exacerbated by a prolonged event and interruption of travel to and within the Big Bear Valley.

4.3.2.3 Individual Hazard Human Loss Estimation

Natural Hazards

1. Drought

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 0
c. The estimated number of displaced persons resulting from this hazard is approximately 0
d. Total number of people affected: 0
e. Percent of community's population at risk: 0%

While drought poses a significant threat to the tourism economy within the Big Bear Valley, this hazard does not pose an imminent threat to human life.

2. Earthquake

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 1
c. The estimated number of displaced persons resulting from this hazard is approximately 7
d. Total number of people affected: 8
e. Percent of community's population at risk: .0014%

The Magnitude 7.6 earthquake that occurred in June of 1992 on the Johnson Valley Fault and caused significant damage to older residential structures supported on post and pier foundation systems and to unreinforced masonry and rock fireplaces prevalent in the Big Bear Valley at that time. However, all of the structures located in the Big Bear Valley are lower level structures with most in the one and two-story category and the balance not exceeding three stories in height. Additionally, this event occurred outside of peak tourism season. These factors resulted in the occurrence of few injuries and no deaths resulting from the 1992 quake. Time of year, time of day of an earthquake event present variables that make it impossible to estimate potential numbers of injuries and loss of human life in the event of the occurrence magnitude 7.7 earthquake on the North Frontal Fault Zone located approximately 7 miles to the north of the Big Bear Valley.

3. Flash Flooding/Flooding

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 1
c. The estimated number of displaced persons resulting from this hazard is approximately 15
d. Total number of people affected:255
e. Percent of community's population at risk: .01%

The February 14, 2019 winter storm event resulted in flooding of numerous residential structures within both the CSD and City of Big Bear Lake jurisdictions. 10 residents had to be temporarily relocated during the performance of flood damage restoration work. 5 residents were temporarily displaced during the January 11, 2005 flood and mud slide event.

5. High Winds/Straight Line Winds

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 0
c. The estimated number of displaced persons resulting from this hazard is approximately 0
d. Total number of people affected: 0
e. Percent of community's population at risk: 0%

While high wind events have resulted in various occurrences of structural damage to residences and commercial buildings and electric utility lines from fallen trees, no injuries or loss of human life has been reported in direct association with a wind event.

6. Infestation

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 0
c. The estimated number of displaced persons resulting from this hazard is approximately 0
d. Total number of people affected: 0
e. Percent of community's population at risk: 0%

There have been no reported injuries or loss of human life in association with this hazard.

7. Wildfires

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 1
c. The estimated number of displaced persons resulting from this hazard is approximately 14
d. Total number of people affected:15
e. Percent of community's population at risk: .0003%

While there have been a significant number of wildfires that have threatened the Big Bear Valley, none of these wildfires has made a significant intrusion into the Valley, resulting in only one reported wildfire related injury and no reported human fatalities.

10. Winter Storms

Summary of Human Losses

a. The estimated number of fatalities resulting from this hazard is approximately 0
b. The estimated number of injuries resulting from this hazard is approximately 3
c. The estimated number of displaced persons resulting from this hazard is approximately 0
d. Total number of people affected: 3
e. Percent of community's population at risk: .0006%

During the winter snow storm of January 2010, three injuries were reported in association with the storm. None of the injuries were critical in nature and no fatalities were reported as a result of this event.

4.3.3 Analysis of Community Development Trends

4.3.3.1 Development History

This section describes the development history for both the City of Big Bear Lake and the Big Bear Community Services District (collectively the “Big Bear Valley”).

Development History*:*

Big Bear Lake and the communities that surround it were historically natural resource areas for the populations in the valleys below, having experienced mining, cattle ranching and forestry "booms" at one time or another. In recent times, the Big Bear Valley has been a weekend and second-home retreat for residents of the San Bernardino, Riverside, and Los Angeles metropolitan areas. The communities surrounding the lake have traditionally been small and rural and, until recently, did not experience the challenges of urbanization faced by other cities in the Inland Empire.

In recent years, as tourism increased, the impacts of these visitors began to be felt by permanent residents. The residents of the Big Bear Valley expressed a strong desire at that time to balance the benefits of growth with the preservation of the natural environment.

There are currently 4,466 acres in the planning area (nearly seven square miles), designated for a broad range of land uses, including residential, commercial, and industrial designations.

Future Development:

There are currently 9240 residential housing units within the City of Big Bear Lake, with a potential of 2,162 future housing units being developed.

There are 729 acres of commercial property within the City and 2028 acres of commercial property within the CSD with approximately 70 acres remaining to be developed.

Unique local characteristics of the Big Bear Valley as a hole have resulted in the development of County of San Bernardino and City of Big Bear Lake general plan and development code provisions that encourage tourism based, low hazard low-rise commercial and retail businesses. Residential development has and is anticipated to continue to consist of low-rise single-family and multi-family structures.

4.4 Multi-Jurisdictional Risk Assessment

4.4 Multi-Jurisdictional Risk Assessment

The jurisdictional areas of the Big Bear Fire Authority, Big Bear City Community Services District and the City of Big Bear Lake fully comprise the Big Bear Valley as a whole and have equal exposure to the natural hazard identified in this plan. Accordingly, the risk assessment identified in this plan applies equally to these three jurisdictions. Additional risk assessment information pertaining to these identified natural hazards in the Big Bear Community Services District jurisdictional area can be found in the County of San Bernardino's MJHMP 2017 update.

Section 5 – Mitigation Strategy

The City, Big Bear Fire Authority and the CSD work closely together in sharing information and ideas generated from past natural hazard events within the Big Bear Valley. Information and idea sharing occurs during direct interagency contacts and also at bi-monthly meetings of the Big Bear Valley Mountain Mutual Aid Association (BBVMMAA). BBVMMAA meeting agendas and meeting minutes for 2019 are attached as Appendix H. This cooperative effort extends to developing General Plan, Development Code, Building Code and Fire Code requirements aimed at mitigating the potential impacts of the natural hazards common to the Big Bear Valley. This objective is identified in Section 5.1 of the County of San Bernardino's MJHMP 2017 update.

5.1 Community Capability Assessment

The State of California recommends that the General Plan be updated every 10 to 20 years. The City of Big Bear Lake last updated its General Plan and Development Code in 2003. Both the City's General Plan and Development Code will be updated in 2020 and 2021 respectively. Environmental hazards identified in both this plan and the Environmental Hazards Element (Appendix E attached hereto) of the City's General Plan will be reviewed and updated as appropriate and reference to the updated MJHMP will be included in the City's General Plan update. As identified in Section 5.1.1 of the County of San Bernardino's MJHMP 2017 update, the County Board of Supervisors adopted their 2017 MJHMP as a part of their General Plan. In addition to the General Plan Elements, the City's Development Code contains requirements that specifically identify mitigation measures for the natural hazards identified in this plan. Specific review of and reference to this MJHMP will be included in the City's 2021 Development Code update.

5.1.1 Existing Plans, Policies, and Ordinances

This section describes the existing plans, policies, and ordinances for the Big Bear Fire Authority, City of Big Bear Lake and the Big Bear City Community Services District. In addition to the General Plan and Development Code requirements discussed above, the City of Big Bear Lake works closely with the Big Bear Fire Authority and Big Bear City Community Services District in the development, modification and review of building, fire, property maintenance standards and codes that assist in our ability to uniformly develop and implement hazard mitigation measures and strategies across the Big Bear Valley.

Big Bear Fire Authority:

- Adoption of 2016 California Fire Code (Ordinance Number BFA2017-001)
- Adoption of the 2018 Community Wildfire Protection Plan
- Fire Fuel Reduction Requirements (Native Brush and Shrub Ordinance Number BFA2017-001 Sec. 49)

City of Big Bear Lake (City Ordinances can be viewed and downloaded at https://library.municode.com/ca/big_bear_lake/codes/code_of_ordinances?nodeId=ORLIDITA:

- City of Big Bear Lake Development Code (Ordinance Number 2003-333)
- Procedures for Tree Conservation within the City (Ordinance Number 2002-325)
- Fire Hazard Abatement (Ordinance Number 95-263)
- Approval, Inspection, and Conditions of Operation for Transient Private Home Rentals (Ordinance Number 99-300)(Amended by Ordinance 2007-375)
- Regulating Slope Density (Ordinance NO. 90-191)(Amended by Ordinance NO. 2005-345)
- Outdoor Fire Permit Requirements (Ordinance Number FP2006-12)
- Wood Shake/Shingle Abatement (Ordinance Number FP2007-13)
- Adoption of 2019 California Fire Code (Ordinance Number 2019-475)
- Adoption of the 2019 Building Standards Code, 2019 California Mechanical Code, 2019 California Plumbing Code, 2019 International Property Maintenance Code, 2019 California Existing Building Code, 2019 California Electrical Code, 2019 California Energy Code, 2019 California Historical Building Code, 2019 California Reference Standards Code
- Fire Fuel Reduction Requirements (Native Brush and Shrub Ordinance Number 2008-379)
- Flood Damage Prevention (Ordinance Number 2009-397)
- Sanitary Sewer Restaurant Discharge Requirements (Ordinance Number 2009-398)
- Storm Water Management Ordinances: Yes
- Stream Management Ordinances: Yes
- Zoning Management Ordinances: Yes
- Subdivision Management Ordinances: Yes
- Erosion Management Ordinances: Yes
- Floodplain Management Ordinances: Yes
- Floodplain Management Plan Published Date: 8/28/2008
- Floodplain Management Last Delineation Date: 2009
- Elevation Certificates Maintained: Yes
- National Flood Insurance Program Community: Yes
- National Flood Insurance Join Date: 3/07/1989
- NFPI Number: 060731
- NFPI Rating:
- NFPI Rating Date:
- Land Use Plan: Yes
- Land Use Plan Last Update: 2017

- Community Zoned: Yes
- Zoned Date: 2003
- Established Building Codes: Yes
- Building Codes Last Updated: 2019
- Type of Building Code: California Building Code
- Local Electric Utilities: Bear Valley Electric
- Local Water Utilities: City of Big Bear Lake Department of Water and Power and the Big Bear City Community Services District
- Local Sewage Treatment Utilities: Big Bear Area Regional Wastewater Agency
- Local Natural Gas Utilities: Southwest Gas
- Local Telephone Utilities: Verizon
- Fire Insurance Rating: After analyzing the structure fire suppression delivery system provided by Big Bear fire Authority, the Insurance Services Office issued a classification of 3.
- Fire Insurance Rating Date: 2/26/2016
- Previous Mitigation Plans: 2012
- Flood Insurance Claims: Unknown

Big Bear City Community Services District:

- Adoption of the 2016 California Fire Code (Ordinance Number BFA2017-001)
- District Emergency Operations Plan
- Water System Emergency Response Plan
- Water System Master Plan
- Sewer System Management Plan
- Spill Prevention Control & Countermeasure Plan
- Storm Water Pollution Prevention Plan
- Business Emergency Contingency Plan

Other regulations involving hazard mitigation have been established at the San Bernardino County level as identified in the County's MJHMP 2017 update.

5.1.2 Prior and Continuing Mitigation Actions and Projects

This section serves to identify previous and ongoing mitigation plans, projects and actions. The City of Big Bear Lake, Big Bear Fire Authority and Big Bear Community Services District will continue to work cooperatively together and with the membership of the Big Bear Valley Mountain Mutual Aid Association to review and refine hazard mitigation strategies and project planning throughout the Big Bear Valley. This cooperative hazard mitigation effort will include joint communication and sharing of information relating to availability of Hazard Mitigation Grant Program funding that is or may become available.

Natural Hazards

1. Drought

A. The Department of Water and Power implemented a community education program regarding water conservation. The DWP works closely with City staff in the review and monitoring of new and existing developments for compliance with State of California mandates of the Model Water Efficiency Landscape Ordinance.

B. The number of water meters was restricted for new construction within the Big Bear Valley during the severe drought period of 1998 through 2004. Additional water well drilling and water storage tank projects have been completed in the past 5 years to significantly increase and improve water delivery and storage capabilities. The DWP continues to monitor existing system delivery facilities and has developed and implemented a capital improvement program that has greatly reduced system loss through the replacement of significant portions of defective and deficient system components.

C. The Department of Water and Power has signage posted throughout the community, reminding citizens about the importance of water conservation.

D. The City of Big Bear Lake, Big Bear City Community Services District and Big Bear Area Regional Waste Water Agency and Department of Water and Power are working together on developing a waste water treatment and recharge program that has the potential to significantly enhance the Big Bear Valley's ability to sustain water resources throughout an extended drought period. The Big Bear Area Regional Waste Water Agency is the lead agency involved in this effort.

2. Earthquake

A. The Big Bear Fire Authority provides an earthquake preparedness education program at the local elementary school each year. All students in the school participated in the program.

B. Fliers on earthquake preparedness have been made available at the San Bernardino County Public Library, Big Bear Lake Branch, in addition to City Hall and the Big Bear Fire Authority.

C. The Building & Safety Division performed evaluations of un-reinforced masonry construction and there are no remaining unreinforced masonry structures remaining within the City of Big Bear Lake. The County of San Bernardino has complied with all State of California mandated mitigation requirements within the Big Bear Community Service District.

D. The City of Big Bear Lake and the County of San Bernardino have adopted the 2019 California Building Codes, which include the latest seismic design and construction standards.

E. Southwest Gas provides natural gas service to customers throughout the Big Bear Valley. Over the past 5 years Southwest gas has replace over 68 miles of gas main and services in efforts to provide a natural gas supply system that is more resilient and reliable even after the occurrence of a major seismic event. In addition, over the next 5 years, Southwest Gas will be replacing 2.4 miles of high-pressure gas lines, building a new regulator station and replacing an existing regulator stations in the Big Bear Valley.

3. Flash Flooding/Flooding

A. The Public Works Division has and continues to clean and maintain flood control channels and natural drainage areas within the City of Big Bear Lake. The Big Bear City Community Services District's flood control channels and natural drainage areas are monitored and maintained by the County of San Bernardino Flood Control District and has established flood mitigation projects as identified in Section 5.1.3.4 of the County of San Bernardino's MJHMP 2017 update.

B. The Big Bear Fire Authority has made information available to community members on mitigation measure that can be taken regarding flooding.

C. Both the County of San Bernardino and City of Big Bear Lake have identified FEMA designated flood zones within the Big Bear Valley and have adopted flood plain management ordinance that are compliant

with FEMA flood plain regulations. All new developments and proposed additions to existing developments within the Big Bear Valley are reviewed for compliance with flood plain management regulations of the County of San Bernardino's or City of Big Bear Lake's Development Services staff.

D. The City of Big Bear Lake is working cooperatively with the County of San Bernardino, CAL Fire, the National Forest Service and state and local trails organizations to plan and develop a comprehensive trail system throughout the Big Bear Valley. In many instances these trails abut existing drainage channels and floodways. As these specific trail projects are developed, flood plain management strategies will be reviewed and flood mitigation measures will be incorporated into the trail design and construction. Trail planning and design staff will review current and proposed Hazard Mitigation Program Grant Funding opportunities as a standard practice within the trail planning and development process.

5. High Winds/Straight Line Winds

A. The Bear Valley Electric Company is currently in the second year of a 5-year $12,200,000 dangerous tree removal or trimming project. This capital improvement project is designed to identify and remove trees or portions of trees that have the potential to damage power lines during high wind events. This program also includes the identification and replacement or remediation of damaged/deteriorating power poles that may fail during a high wind event. In 2019, this program resulted in the removal of 167 dangerous trees, the trimming of 10,904 trees, the replacement of 425 power poles and the remediation of 101 power poles with minor damage. This project is 28% complete.

B. The Bear Valley Electric Company is currently in the second year of a 5-year $3,600,000 tree attachment removal project. This operations and maintenance project is designed to identify and remove power line attachments to trees and mitigate damage to the power line in the event significant tree movement or toppling during a high wind event. In 2019, 273 power line tree attachments were removed. This project is 22% complete.

C. The City of Big Bear Lake and the County of San Bernardino have adopted the 2019 California Building Codes, which include the latest wind design and construction standards. These wind design standards are applied to all new development projects and additions to existing development projects throughout the Big Bear Valley.

D. The Big Bear Fire Authority developed and implemented a "Hazardous Tree Removal Program" and applied for and received Pre-Disaster Hazard Mitigation Grant Program funding for this project. Since 2017, this program has been responsible for the removal of 102 hazardous trees that could have caused significant property damage or personal injury or human death if toppled during a high wind event. This is an on-going program and the Big Bear Fire Authority is currently applying for additional Pre-Disaster Hazard Mitigation Program Grant funding in the planned continuation of this program.

6. Infestation

A. The Big Bear Fire Authority developed and implemented a "Hazardous Tree Removal Program" and applied for and received Pre-Disaster Hazard Mitigation Grant Program funding for this project. The majority of these trees died as a result of bark beetle infestation. This program is designed to mitigate the dangers poses by standing dead trees and minimize bark beetle infestation spread through the treatment and removal of infested trees. Since 2017, this program has been responsible for the removal of 102 hazardous trees that could have contributed to the significant expansion of a bark beetle infestation within the Big Bear Valley. This is an on-going program and the Big Bear Fire Authority is currently applying for additional Pre-Disaster Hazard Mitigation Program Grant funding in the planned continuation of this program.

B. The Big Bear Fire Authority has worked closely with the Mountain Area Safety Task Force in promoting "Fire Safe" communities across the San Bernardino Mountains. Section 5.1.3.1 of the County of San Bernardino's MJHMP 2017 update provides additional detail regarding this multiple agency public outreach effort.

7. Wildfires

A. Thousands of dead/hazard trees have been removed through a cooperative effort between citizens, Big Bear Fire Authority, San Bernardino County, Bear Valley Electric, the Natural Resource Conservation Service (NRCS), and CALFIRE. The Big Bear Fire Authority developed and implemented a "Hazardous Tree Removal Program" and applied for and received Pre-Disaster Hazard Mitigation Grant Program funding for this project. Since 2017, this program has been responsible for the removal of 102 hazardous trees that could have added significant fire fuel to a wildfire event. This is an on-going program and the Big Bear Fire Authority is currently applying for additional Pre-Disaster Hazard Mitigation Program Grant funding in the planned continuation of this program.

B. The Big Bear Fire Authority continuously seeks grant funding opportunities to support the Healthy Urban Forest Initiative.

C. The multi-jurisdictional Big Bear Valley Community Wildfire Protection Plan (CWPP) was recently updated by the Big Bear Fire Authority and promulgates measures to reduce the risks associated with wildfire. The Big Bear Valley CWPP will be used to apply for grant funds for vegetation removal (dead and live fuels).

D. The Big Bear Fire Authority has applied for and received Pre-disaster Hazard Mitigation Program Grant funding for the past decade for significant funding of its Big Bear Chipping Program. This program was designed and implemented to remove forest fuel waste generated during private property owner property maintenance operations conducted in creating defensible space. This wildfire hazard mitigation program is ongoing and has resulted in the removal of 5,008 cubic tons of forest fuel biomass material.

E. The City of Big Bear Lake and the County of San Bernardino have adopted the 2019 California Building Codes, which include the latest urban wildlife interface property maintenance and fire resistive construction standards. These property maintenance and fire resistive construction design standards are applied to all new development projects and additions to existing development projects throughout the Big Bear Valley.

8. Winter Storms

A. Brochures on winter storm preparedness are displayed annually during winter season at the Big Bear Lake Fire Protection District, San Bernardino County Public Library, Big Bear Branch, the Big Bear Community Services District and at the City of Big Bear Lake Civic Center.

B. Public service announcements have are made on both television and radio broadcasts, advising the community of winter storm forecasts.

9. Climate Change

A. Extreme weather events, whether short period or extended duration periods of extreme heat or excessive cold, have the potential to generate environmental conditions that create or exacerbate most of the natural hazards identified in this plan. The City of Big Bear Lake, the Big Bear Fire Authority and

the Community Services District will continue to work with the San Bernardino County Office of Emergency Services in the local in implementation of extreme heat and extreme cold programs as generally identified in Section 5.1.3.5 of the County of San Bernardino's MJHMP 2017 update.

10. Terrorism

A. As identified previously, the likelihood of the occurrence of a terrorism event within the Big Bear Valley is extremely low due to limited population density, Valley remoteness and limited access points, and the lack of high profile targets. We would work with the support of the San Bernardino County Office of Emergency Services in developing need resources and a response plan to a specific terrorism event. This hazard is identified in the County of San Bernardino's MJHMP 2017 update.

5.1.3 Technical and Fiscal Resources

This section describes the technical and fiscal resources for City of Big Bear Lake and the Big Bear City Community Services District.

1. FINANCIAL RESOURCES

The Big Bear City Community Services District has a total 2019-2020 fiscal year budget of $11,564,104, which is predominately utilized to provide their service area with clean and safe potable water, solid waste collection and disposal and waste water collection and disposal. The Big Bear Fire Authority has a 2019-2020 fiscal year budget of $5,506,100, all of which is utilized to provide fire suppression and medical aid services within the Big Bear Valley. The City of Big Bear Lake has a 2019-2020 fiscal year budget of $15,326,020, most of which is utilized to provide general services, development services, law enforcement services and capital improvement project construction and maintenance. The Big Bear City Community Services District relies on the County of San Bernardino for development and implementation of hazard mitigation strategies and programs as defined in the County's MJHMP 2017 update. The Big Bear Fire Authority relies exclusively heavily on Pre-disaster Hazard Mitigation Program and other grant funding in the implementation of its hazard mitigation programs. A significant portion of the City of Big Bear Lake's annual budget can be attributed directly to implementing identified hazard mitigation actions through consistent application of General Plan, Development Code, Building Code and Fire Code and other development standards to proposed new developments and additions to existing developments.

2. TECHNICAL RESOURCES

Description: Through the evaluation of flood plain maps, seismic maps, mutual aid agreements, The City of Big Bear Lake and the Big Bear City Community Services District will continue to create/modify community plans to prepare for natural hazards. Other technical resources will be pursued as necessary to gain necessary data. The Big Bear Fire Authority, City of Big Bear Lake and the Big Bear City Community Services are committed to work together in conjunction with the Big Bear Valley Mountain Mutual Aid Association during any disaster occurrence that has valley wide impacts. Technical resources applicable to the Big Bear City Community Services District are identified in the County of San Bernardino's MJHMP 2017 update.

5.2 Mitigation Goals

5.2 Mitigation Goals

Goals and objectives discussed in this section help describe what actions should occur, using increasingly narrow descriptors. Long Term Goals are developed which can be accomplished by objectives. To achieve the stated objectives "mitigation actions" provide specific measurable descriptions on how to accomplish the objective. The goals, objectives, and actions form the basis for the development of Mitigation Action Strategy and specific mitigation projects to be considered for implementation.

The process consists of 1) setting goals and objectives, 2) considering mitigation alternatives, 3) identifying strategies or "actions", and 4) developing a prioritized action plan resulting in a mitigation strategy.

The following section provides an overview of the Mitigation Goals and Objectives for the 10 profiled hazards in Section 5.1.2 above. These hazards and goals were identified in the City of Big Bear Lake's previous Local Hazard Mitigation Plan and the County of San Bernardino's MJHMP 2017 update. These documents were reviewed by our planning team, which resulted in the elimination of previously identified **Lightning and Thunderstorm Hazards** and the addition of **Climate Change and Terrorism Hazards**. Lightning and Thunderstorm Hazards were removed as a mitigation strategy not already addressed by uniform application of Development Code and Building Code design and construction requirements. Climate Change and Terrorism Hazards were added to address FEMA HMPG hazard analysis requirements.

5.3 Mitigation Actions/Projects

5.3 Mitigation Actions/Projects

This section serves to list previously identified mitigation projects, project status and the planning team's evaluation of projects value to Big Bear Valley by hazard.

Natural Hazards

1. Drought

A. A groundwater recharge feasibility study was completed. This study identified that direct groundwater recharge was not financially feasible due to local geographic factors and other factors. However, the Big Bear Area Regional Wastewater Agency (BBARWA) is pursuing grant funding to pursue a Baldwin Lake and Big Bear Lake recharge project.

B. Water demand offset program. New developments are encouraged to offset estimated water demand by installing efficient appliances/fixtures (assists in ensuring future water supply) (Department of Water and Power).

2. Earthquake

A. Continue annual valley wide public education efforts. Estimated cost: $250 per year. The planning team identified that earthquake preparedness public awareness programs are effective and critical to keeping valley residents prepared to protect themselves during and sustain themselves after a major earthquake event.

3. Flash Flooding/Flooding

City of Big Bear Lake:

A. 42268 Moonridge Road - Deepen existing channel line with concrete (350'). Line existing channel with rip rap (500'). Complete miscellaneous grading improvements (Engineering Division). Cost: $105,000 Completed in 2018.

B. Thrush Drive from Comstock to Big Bear Boulevard – Installation of a debris basin. Installed new underground pipe from Comstock to Big Bear Boulevard an various catch basins (Engineering Division. Completed in 2006 for the total project cost of $2,030,029.02

C. Park Avenue, west of Summit Boulevard – Upsized culverts and raised the road (Engineering Division). Cost: $380,000 Completed in 2007

D. Swan Drive, east of Oriole – Deepen channel and lined with concrete (300') (Engineering Division). Cost: $66,000 Project not constructed yet. Planning team has identified this is a lower priority project at this time.

E. Meadow Park – Installed catch basins at Park Avenue and new pipe to channel at the back of the park (Engineering Division). Cost $255,000 Completed in 2013

F. Knickerbocker Road at Maryland Road – Installed new catch basins at the corner of Knickerbocker Road and Maryland Drive, new 48" pipe across to Knickerbocker Creek (Engineering Division). Cost: $262,000 Completed in 2011.

G. Pine Knot Avenue and Cameron Drive – Install new underground pipe of Cameron Drive from Ironwood to Pine Knot Avenue. Install curb and gutter at the north side of Cameron Drive and new catch basins on Pine Knot Avenue (Engineering Division). Cost: $454,000 Completed in 2007

H. Lakeview Drive and Big Bear Boulevard – Upsized culvert crossing Big Bear Boulevard at Lakeview Drive (210'). Constructed new concrete channel through existing lodge and upsize culverts at Lakeview Drive (Engineering Division). Cost: $239,000 Completed in 2015

I. Big Bear Boulevard at Tulip Lane – Upsize existing culvert, raise road to increase capacity (Engineering Division). Estimated cost: $78,000 Completed in 2006

J. Willow Landing Road at Tayles Point Road – Construct new concrete channel between the properties (Engineering Division). Estimated cost: $45,000 Project not constructed at this time. Planning team identified this as a low priority project.

K. Arroyo Drive at Lakeview Drive and Prairie Lane Drainage Channel Improvements – Reconstruct the entire length of the drainage channel. Completed 10/2019 Cost :$197,455.

L. Rathbun Creek Improvement Project – this floodway extends from Big Bear Lake to the upper Moonridge area. Numerous projects are in the preliminary planning stages for construction projects that will be completed over the next decade.

The City will continue to evaluate the adequacy of flood control facilities in order to identify improvement projects that are appropriate and necessary in mitigating flood hazards.

Big Bear City Community Services District:

Typical areas of flooding within the District are located in the central portion of the valley in normal drainage areas. Beginning with the east in of the District and moving west, the following areas are subject to moderate to severe flooding:

A. Teal Drive north of Big Bear Blvd: Flooding in this area impacts multiple cross streets and several hundred residential structures.

B. Drake Avenue north of Big Bear Blvd: Flooding in this area impacts multiple cross streets and approximately fifty structures.

C. Sawmill Canyon from Sugarloaf Blvd to the airport: Flooding in this area impacts the main thoroughfare of Big Bear Blvd, Fire Station 282, multiple side streets and approximately 50 other structures.

D. Pineview Drive from Raleigh Drive to the airport property: Flooding impacts all residences on Pineview, causing major access issues and potentially disrupting emergency services. Flooding also impacts Big Bear Blvd, several side streets, and several hundred structures.

E. Gildart Drive from Sugarloaf Blvd to the airport property: Flooding impacts multiple side streets and several hundred structures.

F. Greenway Drive and Paradise Way: Flooding flows east / west on these two streets as the local drainage channels overflow, stopping traffic on both streets.

G. Baldwin Lake also has the potential to flood during 100-year flood conditions.

The Big Bear City Community Services District will work with the San Bernardino County Flood Control District to continue mitigation efforts in these identified flood prone areas.

5. High Winds/Straight Line Winds

A. Bear Valley Electric has completed the first year of two five year hazard mitigation programs totaling 15.8 million dollars. These mitigation programs are designed to minimize power outages throughout the Big Bear Valley caused by hazardous trees, tree branches and power line tree attachments that result in damage to power lines during high wind events.

6. Infestation

A. The Big Bear Lake Fire Authority will continue its hazardous tree removal program designed to remove bark beetle infested trees and thereby reduce the chances for a greater infestation issue.

7. Wildfires

The Big Bear Fire Authority's Defensible Space Project proposal includes:

1) A public education campaign, in coordination with the Big Bear Fire Authority, Big Bear Valley Fire Safe Council, City of Big Bear Lake, Big Bear City Community Services District, and San Bernardino County, to educate and ask property owners to create defensible space at each property in the Valley.

2) Offer all property owners a free on-site evaluation by staff from the Big Bear Fire Authority in order to promote the creation of individual defensible space for their property. This opportunity will be continued through the community's public education campaign.

3) The Big Bear Fire Authority, City of Big Bear Lake and the Big Bear City Community Services District will continue to give top priority to programs and activities that promote the creation of defensible space throughout the community. This includes the continuation of outreach to efforts to property owners to create defensible space throughout the community.

4) The Big Bear Fire Authority, the City of Big Bear Lake and the County of San Bernardino have adopted ordinances requiring fire fuels reduction for the creation of enhanced defensible space around structures.

5) Adoption of enhanced mutual aid agreements, resulting in the response of increased resources to wildfire incidents and valley-wide emergency hazard response.

8. Winter Storms

1) The severe winter storm occurrences in recent years had identified the community's need to develop or refine transportation, rescue and sheltering plans during severe winter storm events. These issues are currently under review and mitigation strategies are being developed.

5.4 Implementation Strategy and Analysis of Mitigation Projects

The Big Bear Fire Authority, City of Big Bear Lake and the Big Bear City Community Services District will continue to work together with all local agencies, utility companies and support groups in completing existing mitigation projects and in identifying and implementing new hazard mitigation projects as identified. Historically, the most significant events negatively impacting the Big Bear Valley were, drought, wild fires, earthquake and flooding adjacent to local streams and storm water channels. Mitigation projects focused on addressing previously identified issues in these specific hazard categories are given priority, with a focus on projects providing the highest cost to benefit ratio. In addition, Development, Building, Fire and Flood Ordinances are updated appropriately, and fully applied to all new development to minimize the impacts of all potential identified hazards.

5.5 Multi-Jurisdictional Mitigation Strategy

5.5 Multi-Jurisdictional Mitigation Strategy

The CSD, Fire Authority and City of Big Bear Lake comprise the three jurisdictions with local governing authority in the Big Bear Valley. The hazard analysis effectively addresses hazard exposure to all areas within these three jurisdictional boundaries. Accordingly, the CSD, Fire Authority and City work together through the Big Bear Valley Mountain Mutual Aid Association and other joint Board memberships to development a hazard mitigation strategy that maximizes hazard reduction exposure throughout the Big Bear Valley. This includes the identification, evaluation and implementation of hazed mitigation projects across jurisdictional boundaries. This also includes providing local mutual aid through sharing of personnel and resources to minimize the impacts of a hazard event across our jurisdictional boundaries.

Section 6 – Plan Maintenance

6.1 Monitoring, Evaluating and Updating the Plan

Description of Plan Maintenance Procedures:

Representatives from the Big Bear Fire Authority, City of Big Bear Lake and the Big Bear City Community Services District will continue to oversee plan maintenance and will serve as the plan's facilitator, responsible for holding regularly-scheduled meetings, assigning specific tasks as necessary to monitor and update the plan with planning members. Committees may be established as deemed necessary to ensure the upkeep of the plan. The established Planning Team will reconvene at least once per year to evaluate the effectiveness of previously implemented mitigation actions, examine the progress of non-capital actions, review mitigation efforts and actions being undertaken through other existing plans (i.e., comprehensive general plans), address changing land use patterns and new developments, and identify any changes in risk assessment and/or risk vulnerability. At the end of the next five-year cycle of the Action Program, the Planning Team will oversee a major update to the plan that follows the Federal planning criteria in effect at the time of the update. The updated plan will again be submitted through the State Office of Emergency Services for Federal Emergency Management Agency approval.

6.2 Implementation through Existing Programs

This updated document will be incorporated as part of the City of Big Bear Lake and Big Bear City Community Services District Emergency Operations Plans. Additionally, reference to this updated document will be included in the “Environmental Hazards Element” of the City of Big Bear Lake General Plan. Capital budgeting requirements will be included into local capital improvement plans as deemed appropriate. All incorporations of this plan and the activities herein to other plans shall be given the adequate public process and approval of the legislative bodies.

Implementation of mitigation efforts will be channeled through applicable agencies such as The San Bernardino County Operational Area Coordinating Council, Mountain Mutual Aid Organization, Bear Valley Fire Safe Council, Mountain Area Safety Taskforce, etc…

6.3 Continued Public Involvement

A critical part of maintaining an effective and relevant natural hazards mitigation plan is ongoing public review and comment. Consequently, the Big Bear Fire Authority, City of Big Bear Lake and the Big Bear City Community Services District continue in their dedication to providing for the direct involvement of its citizens in providing feedback and comments on the plan on a continued basis. To this end, the Big Bear Fire Authority, City of Big Bear Lake and the Community Services District have placed this document on their jurisdictional websites and provided the public with contact information as to where their input and comments regarding the plan can be submitted for consideration by each jurisdiction. Public meetings will be held when significant modifications to the plan are required or when otherwise deemed necessary. The public will be able to express their concerns, ideas and opinions at the meetings.

APPENDIX A

[ON FOLLOWING PAGE]

APPENDIX A

17.10.070 - Property maintenance.

A. Fire Protection. In compliance with the City of Big Bear Lake Municipal Code Title 8(Health and Safety) Chapter 8.72 (Refuse and Weed Abatement) it shall be the duty of every owner, occupant and person in control of any land or interest therein in the city to abate there from and from all sidewalks, parkways and from any public highway or any public easement adjacent to such land, all noxious weeds or vegetation, dry grass, Russian thistle (tumbleweeds) dead trees, and all combustible rubbish or vegetation that constitutes a fire hazard, which may endanger or injure neighboring property or the health, safety or well-being of persons or property.

B. Tree Conservation Requirements. The following requirements shall apply to all properties within the city:

1. Landscaping material, which requires daily surface watering, shall not be planted within the drip line of native conifer and oak trees. Instead, plants within this area shall be drought resistant and require no more water than the native trees. If any irrigation is needed, drip irrigation shall be used.
2. Irrigation lines and sprinkler heads shall not be placed so as to spray on tree trunks of native conifer and oak trees. For native conifer and oak trees, irregular deep watering is encouraged, rather than daily surface watering. Every effort should be made to install irrigation trenches outside the critical root zones. Soil should only be compacted where the job engineer requires. Trenches should be backfilled as soon as possible.
3. No changes to the grade shall occur within the critical root zone of existing trees through construction of retaining walls, cut or fill, or other means, without plan review and approval pursuant to Sections 17.10.040 and 17.10.050 of this chapter.
4. No pavement shall be installed within the critical root zone of existing native trees without issuance of a plan review and approval pursuant to Sections 17.10.040 and17.10.050(B)(2) of this chapter.

C. Defensible Space. It shall be the responsibility of every property owner occupant and person in control of any land interest to abate the accumulation of forest fuels around their property, through implementation of the following measures within ten (10) feet of roads and driveways, and within an area surrounding the dwelling unit(s) from zero to one hundred (100) feet in the front and rear yards, or to the property lines (whichever is less); and between the dwelling unit(s) and side property lines:

1. Remove all dead trees, and all combustible rubbish, burnable fuels, debris, or noxious material that constitutes a fire, health or safety hazard, or which may endanger or injure neighboring property, or the health, safety, or well-being of persons or property including but not limited to all pine needles and branches on roofs, ground debris, logs and snags, grass four inches and higher, pine needles on the ground down to a two-inch depth, and dead branches in bushes and trees.

Exception: Grass, flammable vegetation and other combustible growth located more than thirty (30) feet from any structure and less than eighteen (18) inches in height may be maintained where necessary to stabilize the soil and prevent erosion.

2. Cut logs or firewood greater than one cord of wood or one hundred twenty-eight (128) cubic feet shall be located ten (10) feet away from any structure or shall be covered with a fire resistive structure or fabric. Firewood should be stacked away from the drip line of trees.
3. Thin dense groups of young trees (less than six inches in diameter) to a six to eight foot spacing, measured trunk to trunk. Removal of any live tree with a diameter of more than twelve (12) inches measured at four and one-half feet above the ground requires approval by the city.
4. In areas with a continuous canopy, any tree taller than forty-five (45) feet should have its branches trimmed back to the trunk if those branches have any portion lower than twelve (12) to fifteen (15) feet from the ground. A tree shorter than forty-five (45) feet should be trimmed to remove any dead branches up one-third of its total height. For non-continuous canopy areas, tree branches shall be pruned to remove limbs located less than six feet above the ground service. A minimum vertical separation between the top of a shrub and the bottom lower branches shall be three times the height of the shrub.

APPENDIX B

[ON FOLLOWING PAGE]

17.10.075 - Native brush and shrub.

APPENDIX B

A. Municipal Code Section 8.94.010 Native Brush and Shrubs.
   1. It shall be the duty of every owner of real property in the City of Big Bear Lake to abate as a nuisance from such real property and from all parkways, native brush and shrubs, that constitute a fire, health, or safety hazard, or which may endanger or injure neighboring property, or the health, safety, or well-being of persons or property.
   2. Juniper shrubs, Spanish broom, and native brush shall not be planted or maintained within fifteen (15) feet of any building or structure, including, without limitation, any deck or patio. All owners of any real property in the City of Big Bear Lake shall be required to fully comply with this provision by modifying the offending native brush and shrub, which shall be considered a nuisance, from within fifteen (15) feet of any building or structure.
   3. All native brush and shrubs shall be installed and maintained in a manner that minimizes fire risk, including, without limitation, by removing dead branches and twigs at all heights, modifying the lower foliage of branches, and selectively pruning to reduce the density of the plant.
   4. Native brush and shrub shall be installed and maintained with horizontal spacing such that the space between two shrubs (horizontally) shall be a minimum of two times the height of the tallest shrub. Individual shrubs or groups of shrubs clumped together shall be modified so that their diameter does not exceed fifteen (15) feet. Groups of shrubs clumped together with a diameter of fifteen (15) feet or less shall be treated as a single plant.
   5. Paragraphs (B), (C) and (D) of this section shall not apply to an isolated shrub or shrubs that have been heavily modified by thinning and limbing up, nor to activities within the boundaries of a plant conservation easement area, that do not, in the opinion of the fire chief, or his or her designee, constitute a fire hazard. In deciding whether such shrub or shrubs constitute a fire hazard, the fire chief, or his or her designee, shall consider (i) the proximity of the shrub(s) to other buildings or structures; (ii) the types of shrub(s) involved; (iii) the potential threat of the shrub(s) to the public health, welfare and safety; and (iv) any other factors that the fire chief, or his or her designee, deem relevant when considering the public health, safety and welfare, including, without limitation, whether such shrub(s) is endangered, rare or threatened.
   6. Cut and/or thinned vegetation shall be disposed of no later than ten (10) days after cutting.

B. Municipal Code Section 8.94.020 Environmental Exemptions. The modification of brush or shrubs, as described in this chapter, shall be exempt from the provisions of this chapter if any or all of the following would occur:
   1. The activities would result in the taking of endangered, rare, or threatened plant or animal species. By way of example, and not by way of limitation, the following species of plant are, as of the date of the ordinance adopting this chapter, not threatened or endangered and are subject to the provisions of this chapter:
      a. The arctostaphylos patula species of manzanita.
      b. The cercocarpus ledifolius species of mountain mahogany (brush form) (commonly known in Big Bear Valley as ironwood).
      c. Sage species that occur in the Big Bear Valley.
   2. The activities would result in significant erosion and sedimentation of surface waters. The owner of each piece of real property within the City of Big Bear Lake shall, when performing modifications required by this chapter, keep soil disturbance to a minimum, especially on steep slopes. Erosion control techniques such as leaving root balls intact, minimizing use of motorized equipment and covering exposed disturbed soil areas with mulch or similar materials shall be employed in order to help reduce soil erosion and plant re-growth.

C. Municipal Code Section 8.94.030 Exceptions to Ordinance.
   1. Nurseries, and other similar agricultural and/or horticultural uses shall be exempt from Chapter 8.94, provided the fire chief, or his or her designee, shall have the discretion to enforce the provisions of this chapter with respect to such businesses as he or she deems necessary to promote the public health, safety and welfare as it relates to fire safety and/or the health of the forest. In using his or her discretion, the fire chief, or his or her designee, shall consider: (i) the health of the brush and/or shrubs involved; (ii) whether the brush and/or shrubs pose a risk to the public health, safety or welfare of the community; (iii) the type of brush and/or shrubs involved: (iv) the owner's maintenance activities involving the brush and/or shrubs; and (v) any other factors that the fire chief, or his or her designee, deem relevant when considering the public health, safety and welfare, including, without limitation, whether such shrub(s) is endangered, rare or threatened.
   2. Up to two inches of dead pine needles, leaves and other soils amendments for soil replenishment and forest safety may be permitted when in the opinion of the fire chief or his/her designee they do not constitute a fire hazard. In deciding whether they present a fire hazard, the fire chief or his/her designee shall consider:
      a. The proximity of the pine needles and leaves to buildings or structures;
      b. The height of the lower branches of shrubbery from the ground (as per Section 8.94.010(C), above);
      c. The condition of the shrubbery, (e.g., free from dead and dying limbs and leaves) (as per Section 8.94.010(C), above);
      d. The sectioning of the shrubbery (as per Section 8.94.010(D), above); and
      e. Any other factors that the fire chief or his/her designee deem relevant when considering the public health, safety and welfare.

D. Municipal Code Section 8.94.040 Certificate of Compliance Required. Upon the effective date of the ordinance adopting this chapter, the owner of the each piece of real property within the City of Big Bear Lake: (i) As a condition precedent to, the issuance of any discretionary permit or any building permit; or (ii) As a condition precedent to, the issuance of an initial

APPENDIX C

[ON FOLLOWING PAGE]

Chapter 15.64 - FLOODPLAIN MANAGEMENT

APPENDIX C

ARTICLE I. - GENERAL PROVISIONS

15.64.010 - Statutory authorization.

The legislature of the state of California has in Government Code Sections 65302, 65560, and 65800 conferred upon local government units authority to adopt regulations designed to promote the public health, safety, and the general welfare of its citizens. Therefore, the city council of Big Bear Lake does hereby adopt the following floodplain management regulations.

(Ord. 2002-324 § 1(part), 2002)

15.64.020 - Findings of fact.

The city council hereby finds that there is a need to manage floodplains within the city to promote public health, safety and the general welfare of its citizens and finds the following:

A. The flood hazard areas of the city of Big Bear Lake are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.

B. These flood losses are caused by uses that are inadequately elevated, flood proofed, or protected from flood damage. The cumulative effect of obstructions in areas of special flood hazards, which increase flood heights and velocities, also contribute to the flood loss.

(Ord. 2002-324 § 1(part), 2002)

15.64.030 - Statement of purpose.

It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

A. Protect human life and health;

B. Minimize expenditure of public money for costly flood control projects;

C. Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;

D. Minimize prolonged business interruptions.

E. Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in areas of special flood hazard;

F. Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;

G. Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

(Ord. 2002-324 § 1(part), 2002)

15.64.040 - Methods of preventing flood loss.

In order to accomplish its purposes, this chapter includes methods and provisions to:

A. Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;

B. Require that uses vulnerable to floods, including facilities that serve such uses, be protected against flood damage at the time of initial construction;

C. Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;

D. Control filling, grading, dredging, and other development which may increase flood damage; and

E. Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

(Ord. 2002-324 § 1(part), 2002)

15.64.050 - Definitions.

Unless specifically defined below, words or phrases used in this chapter shall be interpreted so as to give them the meaning they have in common usage and to give this chapter its most reasonable application:

"Accessory use" means a use that is incidental and subordinate to the principal use of the parcel of land on which it is located.

APPENDIX D

[ON FOLLOWING PAGE]

Chapter 17.11 - WATER CONSERVATION

Sections:

APPENDIX D

17.11.010 - Purpose.

The purpose of this chapter is to provide water conservation measures in order to minimize the effect(s) of a water shortage on the citizens of, visitors to, and the economic well-being of the city and, by means of this chapter, to adopt provisions that will significantly reduce the wasteful and inefficient consumption of water over an extended period of time, thereby extending the available water resources required for the domestic, sanitation and fire protection needs of the citizens of, and visitors to, the city, while reducing the hardship of the city and the general public to the greatest extent possible.

(Ord. 87-151 § 1, 1987)

17.11.020 - Policy, objectives and goals.

It is declared that, because of the conditions prevailing in the city of Big Bear Lake and areas elsewhere from which the city of Big Bear Lake obtains its water supplies, the general welfare requires that the water resources available to the city be put to the maximum beneficial use to the extent to which they are capable and that the wasteful, inefficient or unreasonable use or method of use of our limited and finite water resources be prevented. As such, the conservation of such waters is to be exercised with a view to the reasonable and beneficial and efficient use thereof, in the interests of the people of the city and for the public welfare. Therefore, the city of Big Bear Lake declares and establishes the following goals, objectives and policies pertaining to the conservation and use of water:

A. Goals.
   1. The conservation of water;
   2. The efficient use and distribution of available water supplies;
   3. Adequate and sufficient potable water supply and availability for the greatest public benefit, with particular regard to human consumption, sanitation and fire protection.

B. Objectives.
   1. To conserve available water supplies;
   2. To achieve an overall water use reduction;
   3. To reduce the volume of wasted water;
   4. To reduce the demand for water and thus to slow down the need for new capital facilities;
   5. To continuously increase consumer awareness about the need for, and benefits of, water conservation;
   6. To reduce or eliminate wasteful and inefficient uses of water;
   7. To assure an adequate supply of potable water sufficient to meet the essential private and public needs of the city's growing population and economy;
   8. To minimize leakage of water from the distribution system;
   9. To assure that all new developments and that existing developments which are resold, remodeled or added to are equipped with water-conserving devices, fixtures and appliances;
   10. To increase the use of native or water-conserving plant species for landscaping purposes;
   11. To assure that development occurring on identified groundwater recharge areas maintains or enhances the site's natural water recharge characteristics and attributes.

C. Policies.
   1. All new structures shall be (re)equipped with low-flush toilets, as per Section 17921.3 of the California Health and Safety Code, and with low-flow showers and faucets, as per Title 24, Part 6, Article 1, T20-1406F of the California Administrative Code, in addition to

APPENDIX E

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APPENDIX F

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APPENDIX G

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APPENDIX H

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