



## 3.0 Overview And Prioritization Of Hazards

### Update Summary

The 2018 update built and expanded upon the previous State HMP's risk assessment. Major improvements, enhancements, and updates to note include:

The flood hazard now includes dam, levee and canal failure.

The severe storm hazard now includes lightning, wind and tornado.

Each hazard section discusses potential impacts as a result of the changing climate.

The Idaho Multi-Hazard Risk Portfolio (IMHRP) has been integrated into the State's risk assessment.

The vulnerability assessment summarizes information by county and Tribal Nation; whereas the 2013 SHMP summarized by IOEM Regions.

A State-building (owned and leased) spatial inventory was developed for an in-depth review of State asset vulnerability to identified hazards.

An updated and expanded critical facility spatial dataset was utilized.

U.S. Census block level aggregate building inventory and demographic data based on the 2010 U.S. Census in HAZUS-MH was utilized.

### Overview

The State of Idaho is prone to many natural and manmade hazards. An overview of the Federal Declaration Process provided by the Federal Emergency Management Agency (FEMA) is below:

*The Stafford Act (§401) requires that: "All requests for a declaration by the President that a major disaster exists shall be made by the Governor of the affected State."*

*The Governor's request is made through the regional FEMA office. State and Federal officials conduct a preliminary damage assessment (PDA) to estimate the extent of the disaster and its impact on individuals and public facilities. This information is included in the Governor's request to show that the disaster is of such severity and magnitude that effective response is beyond the capabilities of the State and the local governments and that Federal assistance is necessary. Normally, the PDA is completed prior to the submission of the Governor's request. However, when an obviously severe or catastrophic event occurs, the Governor's request may be submitted prior to the PDA. Nonetheless, the Governor must still make the request.*

*As part of the request, the Governor must take appropriate action under State law and direct execution of the State's emergency plan. The Governor shall furnish information on the nature and amount of State and local resources that have been or will be committed to alleviating the results of the disaster, provide an estimate of the amount and severity of damage and the impact on the private and public sector, and provide an estimate of the type and amount of assistance needed under the Stafford Act. In addition, the Governor will need to certify that, for the current disaster, State and local government obligations and*



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expenditures (of which State commitments must be a significant proportion) will comply with all applicable cost-sharing requirements.

Based on the Governor's request, the President may declare that a major disaster or emergency exists, thus activating an array of Federal programs to assist in the response and recovery effort. Not all programs, however, are activated for every disaster. The determination of which programs are activated is based on the needs found during damage assessment and any subsequent information that may be discovered. Some declarations will provide only individual assistance or only public assistance. Hazard mitigation opportunities are assessed in most situations.

Idaho has experienced thousands of hazard events, resulting in millions of dollars in losses and casualties, and 31 major Federal disaster (DR) and emergency (EM) declarations and 15 fire management assistance (FM) declarations. Table 3.A identifies the Federal disaster declarations in Idaho since 1954. Please note that the events listed in bold type have occurred since the 2013 SHMP Update.

**Table 3.A. Major Federal Disaster and Emergency Declarations**

Incident Begin Date	Incident Type	Disaster Number	Declaration Type	Counties Affected
May 6, 2017	Flooding, Landslides and Mudslides	4333	Major Disaster Declaration	Blaine, Camas, Custer, Elmore, and Gooding
March 29, 2017	Flooding	4342	Major Disaster Declaration	Ada, Canyon
March 6, 2017	Severe Storms, Flooding, Landslides, and Mudslides	4313	Major Disaster Declaration	Benewah, Bonner, Boundary, Clearwater, Idaho, Kootenai, Latah, Shoshone, and Valley
February 5, 2017	Severe Winter Storms and Flooding	4310	Major Disaster Declaration	Bingham, Cassia, Elmore, Franklin, Gooding, Jefferson, Jerome, Lincoln, Minidoka, Twin Falls, and Washington
August 21, 2016	Henry's Creek Fire	5151	Fire Management Assistance Declaration	Bonneville
December 16, 2015	Severe Winter Storms	4252	Major Disaster Declaration	Benewah, Bonner, and Kootenai
November 17, 2015	Severe Storm and Straight-line Winds	4246	Major Disaster Declaration	Benewah, Bonner, Boundary, Coeur d'Alene Indian Reservation, and Kootenai
August 29, 2015	Tepee Springs Fire	5110	Fire Management Assistance Declaration	Idaho
August 14, 2015	Municipal Fire	5105	Fire Management Assistance Declaration	Clearwater, Nez Perce Tribe
August 10, 2015	Clearwater Lawyer Branch Fire Complex	5099	Fire Management Assistance Declaration	Lewis, Idaho, Nez Perce Tribe



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Incident Begin Date	Incident Type	Disaster Number	Declaration Type	Counties Affected
July 5, 2015	Cape Horn Fire	5088	Fire Management Assistance Declaration	Bonner, Kootenai
August 15, 2013	Beaver Creek Fire	5045	Fire Management Assistance Declaration	Blaine, Boise, Camas, Custer, Elmore, and Oneida
August 12, 2013	Elk Fire	5043	Fire Management Assistance Declaration	Blaine, Boise, Camas, Custer, Elmore, and Oneida
September 18, 2012	Karney Fire	5019	Fire Management Assistance Declaration	Boise
August 3, 2012	Trinity Ridge Fire	5006	Fire Management Assistance Declaration	Elmore
March 31, 2011	Flooding / Landslides / Mudslides	1987	Major Disaster Declaration	Bonner, Clearwater, Idaho, Nez Perce, Nez Perce Tribe, Shoshone
August 26, 2010	Hurd Fire	2853	Fire Management Assistance Declaration	Valley
July 27, 2010	Severe Storms / Flooding	1927	Major Disaster Declaration	Adams, Gem, Idaho, Lewis, Payette, Valley, Washington
July 31, 2008	Flooding	1781	Major Disaster Declaration	Kootenai, Shoshone
August 30, 2007	Cascade Fire Complex	2726	Fire Management Assistance Declaration	Valley
August 30, 2007	East Zone Fire Complex	2725	Fire Management Assistance Declaration	Valley
August 29, 2007	Castle Rock Fire	2724	Fire Management Assistance Declaration	Blaine
February 27, 2006	Severe Storms / Flooding	1630	Major Disaster Declaration	Owyhee
September 13, 2005	Hurricane Katrina Evacuation	3244	Emergency Declaration	All 44 counties
July 6, 2005	Heavy Rains / Flooding	1592	Major Disaster Declaration	Nez Perce
September 1, 2000	Wildfires	1341	Major Disaster Declaration	Ada, Bannock, Bingham, Blaine, Clearwater, Custer, Elmore, Idaho, Jerome, Lemhi, Lewis, Lincoln, Power, Valley
June 13, 1997	Flooding	1177	Major Disaster Declaration	Benewah, Bingham, Bonner, Bonneville, Boundary, Butte, Custer, Fremont, Jefferson, Kootenai, Madison, Shoshone
January 4, 1997	Severe Storms/Flooding	1154	Major Disaster Declaration	Adams, Benewah, Boise, Bonner, Boundary, Clearwater, Elmore, Gem, Idaho, Kootenai, Latah, Nez Perce, Owyhee, Payette, Shoshone, Valley, Washington



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Incident Begin Date	Incident Type	Disaster Number	Declaration Type	Counties Affected
February 11, 1996	Storms/Flooding	1102	Major Disaster Declaration	Benewah, Bonner, Boundary, Clearwater, Idaho, Kootenai, Latah, Lewis, Nez Perce, Payette, Shoshone
February 16, 1984	Flooding (Ice Jams)	697	Major Disaster Declaration	Lemhi
January 18, 1983	Earthquake	694	Major Disaster Declaration	Butte, Custer, and Gooding
May 22, 1980	Volcanic Eruption (Mt. St. Helens)	624	Major Disaster Declaration	Benewah, Bonner, Boundary, Clearwater, Kootenai, Latah, Nez Perce, and Shoshone
August 8, 1979	20-Mile Fire	2038	Fire Management Assistance Declaration	No declared areas for this disaster
August 20, 1977	Wilson Creek Fire	2029	Fire Management Assistance Declaration	No declared areas for this disaster
May 5, 1977	Drought	3040	Emergency Declaration	Adams, Bear Lake, Blaine, Camas, Caribou, Elmore, Idaho, Lincoln, and Washington
June 6, 1976	Dam Collapse (Teton Dam)	505	Major Disaster Declaration	Bingham, Bonneville, Fremont, Jefferson, and Madison
January 25, 1974	Severe Storms/Flooding (Snowmelt)	415	Major Disaster Declaration	Adams, Benewah, Bonner, Boundary, Clearwater, Kootenai, Latah, Shoshone, and Washington
March 2, 1972	Severe Storms/Flooding	324	Major Disaster Declaration	Latah
August 30, 1967	Forest Fires	231	Major Disaster Declaration	Benewah, Bonner, Boundary, Clearwater, Idaho, Kootenai, Latah, Lewis, Nez Perce, and Shoshone
December 31, 1964	Heavy Rains/Flooding	186	Major Disaster Declaration	Ada, Bannock, Benewah, Blaine, Boise, Bonneville, Butte, Camas, Caribou, Cassia, Clearwater, Elmore, Gem, Gooding, Idaho, Jerome, Kootenai, Latah, Lewis, Lincoln, Minidoka, Nez Perce, Owyhee, Payette, Power, Shoshone, and Washington
February 14, 1963	Flooding	143	Major Disaster Declaration	No declared areas for this disaster
February 14, 1962	Flooding	120	Major Disaster Declaration	No declared areas for this disaster
June 26, 1961	Flooding	116	Major Disaster Declaration	No declared areas for this disaster
July 22, 1960	Wildfires	105	Major Disaster Declaration	No declared areas for this disaster
May 27, 1957	Flooding	76	Major Disaster Declaration	No declared areas for this disaster



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Incident Begin Date	Incident Type	Disaster Number	Declaration Type	Counties Affected
April 21, 1956	Flooding	55	Major Disaster Declaration	No declared areas for this disaster

Source: FEMA 2017

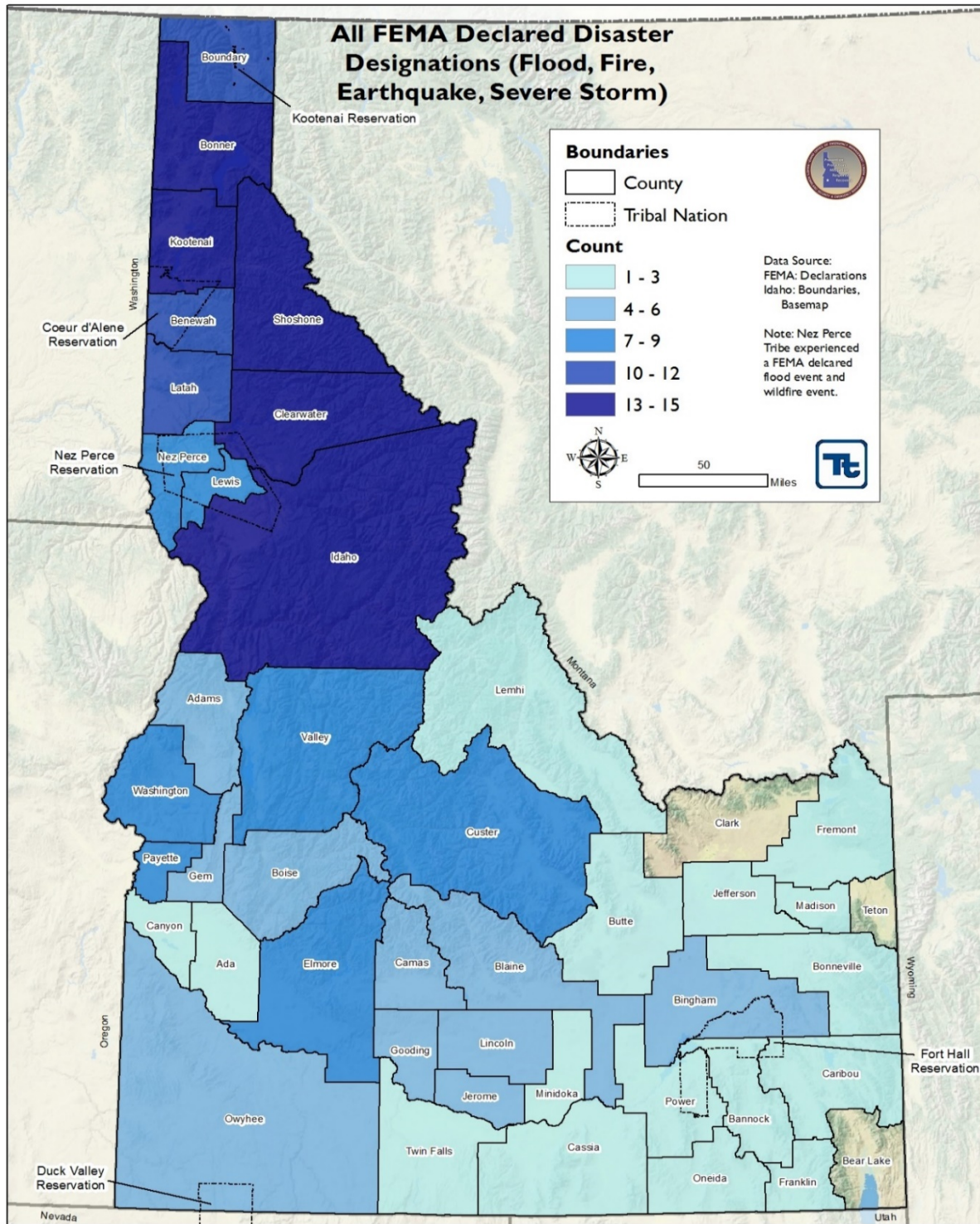
Based on the data in Table 3.A, floods were a component of 21 disasters (45-percent); wildfires were a component of 18 disasters (39-percent); severe storms were a component of 10 disasters (21-percent); landslides and mudslides were a component of three disasters (6-percent); earthquake was a component of one disaster (2-percent); drought was a component of one disaster (2-percent); dam collapse was a component of one disaster (2-percent); and evacuation was a component of one disaster (2-percent). Please note that many of the declarations were classified as a combination of incident types; therefore, the percentages calculated may include the same event in the different declaration types.

Since the 2013 SHMP, there have been 13 Federal major disaster, emergency and fire management assistance declarations. Figure 3.B illustrates the Federal declarations across the State. This analysis indicates that Federal disaster declarations tend to occur more frequently in northern portion of the State.



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Figure 3.B. Number of FEMA Declared Disasters in each County and Tribal Nation



Source: FEMA



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In addition to the federal disasters declared, Idaho experienced six additional State Declarations that were not declared federally since the 2013 plan update. Four of these were for drought and two additional were for severe storms.

**Figure 3.C. State of Idaho Disaster Declarations not Resulting in a Federal Declared Disasters**

Year	Hazard	Date	State Declaration	Counties Affected	Comments
2013	Drought	May - August	Drought State DRs	Lincoln, Fremont, Butte, Blaine, Custer, Clark, Teton, Jefferson, Bingham, Gem, Bonneville, Bear Lake, Power, Madison, Lemhi, Caribou, Oneida, Bannock, Lewis	These counties rely upon water supplies from various drainage basins. The drainage basins experienced abnormally dry conditions due to below normal precipitation and snowpack levels.
2014	Drought	April	Drought State DRs	Blaine, Lincoln, Custer, Clark, Butte, Lincoln	Moderate to severe drought conditions due to below normal snowpack and precipitation levels.
2015	Drought	April	State DRs issued	Butte, Custer, Blaine, Lincoln, Fremont, Teton, Clearwater, Lewis, Jefferson	Moderate to severe drought conditions due to below normal snowpack and precipitation levels.
2016	Drought	August - September	State DRs issued	Custer, Jefferson, Lemhi	Stream flow volumes in the area for the period June through September were forecasted to be about 44 to 70 percent of average.
2014	Severe Storms	August 4	ID-01-2014	Elmore	
2016	Severe Storms	February 12	ID-01-2016	Idaho	

Source: IOEM

The 2018 SHMP profiles 8 natural and 5 technological and human-caused hazards including: floods (includes dam/levee/canal failure), earthquakes, wildfires, landslides, avalanches, drought, severe storms (includes lightning, winds/tornadoes), volcanic eruptions, hazardous materials, radiological, pandemic, cyber disruption, and civil disturbances. From a statewide perspective, the three most significant are:

- Wildfires
- Floods
- Severe Storms

The natural hazards were similarly identified in the 2013 plan update, with the only difference being severe storms assessed as a more significant hazard over earthquake. This conclusion is based on: the types of recent major disaster declarations, an assessment of the types of historical disaster declarations, the results of the vulnerability and loss assessments, the statewide risk factor exercise, and the hazards identified as significant in local plans.

The data indicated severe storms occur frequently and are an element of many disaster declarations, both state and federal. Due to the widespread areas where earthquakes could occur and the potential



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impacts, earthquakes are significant; however, they have occurred relatively infrequently in the past (one declaration), and thus earthquakes ranked lower than severe storms.

Based on the number of local plans identifying landslides as significant, that hazard was considered as possible significant State hazards. However, due to the localized and relatively low impact of landslides, these were not considered as a significant statewide hazard. Hazardous materials were also identified in a number of local plans, but this hazard was not considered as a significant statewide hazard because it is man-made.

Chapter 3 covers six separate requirements of the Code of Federal Regulations (CFR) in 44 CFR 201.4: identifying hazards, profiling hazard events, assessing vulnerability by jurisdiction, estimating potential losses by jurisdiction, assessing the vulnerability of State facilities, and estimating potential losses of State facilities. These requirements are integrated into each profiled hazard. The hazards were organized by the top three assessed hazards for the state (wildfire, flood, and severe storms), and then organized alphabetically by natural and then human caused hazard.

Chapter 3 has been significantly enhanced in the 2018 update to include risk and loss estimation data by county and in some instances, city. This greatly improves the statewide perspective and allows for jurisdictions to gain a better understanding of the hazard threats, risk, and loss estimation in their area.

### **Risk Assessment Summary 2018**

The 2018 update continued to build and expand upon the previous SHMP's risk assessment. Improvements, enhancements, and updates are summarized below, including a number of newly available data sets that were incorporated, where possible, into the vulnerability and loss assessments. A summary of these data sources are listed below.

- The Idaho Multi-Hazard Risk Portfolio (IMHRP) was updated in 2015 to evaluate the risk of flood, wildfire and seismic activity on a watershed scale to private property so that both government and individuals within the state can better plan for, respond to and mitigate the effects of natural hazards. This data was integrated into the flood, wildfire and seismic vulnerability summaries.
- Since the 2010 SHMP, the State identified the need to collect improved State-owned facility and infrastructure data in a geospatial format. A State-owned and -leased spatial inventory was developed as part of the 2018 SHMP risk assessment update to allow for a more in-depth review of State-assets, as it relates to both vulnerabilities to hazards and the associated loss estimations.
- A comprehensive critical facility inventory was developed combining data sources from the 2013 SHMP with additional input from the Idaho Office of Emergency Management.
- FEMA's HAZUS-MH v4.0 has demographic and building stock data based on the 2010 U.S. Census available at the block level with valuations based on RS Means 2016. This data was utilized within the HAZUS-MH flood and earthquake models, in addition to being exported from the software to be used in the exposure analysis for the dam failure, earthquake, flood, landslide, severe storm, and wildfire hazards.





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- In addition to hazard-specific data used in the 2013 plan, additional hazard datasets and updated data were used to allow for an enhanced assessment. This includes utilizing the digitized flood hazard data for counties not included in the National Flood Hazard Layer developed by FEMA Region 10. Flood hazard boundaries from both sources were used to estimate exposure to population, building stock, state assets, and critical facilities, as well as were used to generate a one percent annual chance event flood depth grid for each county to be utilized in HAZUS-MH.
- The U.S. EPA's Integrated Climate and Land-Use Scenarios (ICLUS) project generated projected population and land use projections for the United States through 2100. This data was utilized to understand population and development trends projections in identified hazard areas.

### **Methodology**

Risk, for the purposes of hazard mitigation planning, is the potential for damage or loss created by the interaction of natural hazards with assets, such as people, buildings, infrastructure and/or natural and cultural resources. In accordance with the FEMA State Mitigation Key Topics Bulletin for the Risk Assessment, the risk assessment is the process by which the state hazard mitigation plan team determines which hazards are of concern and assesses the potential impacts of those hazards on a statewide scale. The risk assessment helps communicate vulnerabilities, develop priorities and inform decision-making.

The State of Idaho's risk assessment is organized by hazard so that all information, hazard profile and vulnerability assessment, may be found in one section for each particular hazard.

### **Hazard Profile**

Each hazard section includes a hazard profile that describes the hazard and provides information regarding the geographic location and extent of the hazard. Previous occurrences are summarized including an overview of past significant events that occurred in the State since the last plan update. For the purposes of the 2018 update, previous events from 2012 through October 1, 2017 were captured. This section includes damages, level of severity, dates and duration of events, and sources of information used to obtain the information. Federal, state, and local sources were reviewed to obtain the historic information. Research was based on events that caused fatalities, injuries, property damages, and/or crop damages.

Each hazard profile also discusses and analyzes each hazard's probability for future occurrence, severity, warning time and secondary hazards. The probability of future occurrences are based on the number of past events divided by the number of years researched to determine the percentage. Potential change in climate and its impacts on the hazards of concern are discussed.

### **Vulnerability Assessment**

For the 2018 SHMP update, the vulnerability assessment for each hazard follows its hazard profile, so that all information about a particular hazard is found in one section. A statewide risk assessment was



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conducted assessing the State’s vulnerability as a whole and assessing the local vulnerability with results summarized at the county level.

### *Assessment of State Vulnerability*

To assess the State’s vulnerability, an assessment was conducted to determine the State assets (State-owned and leased buildings) and critical facilities that may be affected to the identified hazards of concern. The following describes the inventory of assets the State identified for the purposes of the hazard mitigation risk assessment.

#### State Assets

In November 2017, the Risk Management Technical Records Office provided a list of 3,951 state-owned and leased properties to utilize for the risk assessment. The property list geocoded the state-properties list to generate a spatial layer with the attributes needed for the analysis. Not all addresses had sufficient data for geocoding. Of the total 3,951 buildings, 2,713 had sufficient data to be successfully geocoded and included in the spatial analysis. If a building did not have the attribute identifying if it is State-owned or leased, it was assumed owned. The building and content replacement values were provided in the dataset and were used to support the loss estimation. For buildings missing a value, the average for buildings of that type was used.

To determine hazard exposure, a spatial analysis was conducted in GIS using the best available hazard data and the state asset layer. When the analysis determined the asset is located in the hazard area, it was deemed exposed to the hazard and potentially vulnerable. Additional details regarding the methodology used to assess vulnerability and estimate potential losses are presented in each hazard section. Tables 3.E and 3.F summarize the number of state buildings and their replacement costs by agency and jurisdiction, respectively. Some facilities may be calculated at both county and tribal.

**Table 3.E. Summary of State Facilities by Agency**

State Agency	State-Owned Buildings		State-Leased Buildings	
	Count	Total RCV	Count	Total RCV
Administration - Department Of	16	\$545,649,860.87	0	\$0.00
Blind Commission	1	\$12,931,760.00	0	\$0.00
Board Of Pharmacy	0	\$0.00	1	\$550,280.10
Boise State University	216	\$1,478,845,527.68	0	\$0.00
Boise Veteran's Home	3	\$35,009,037.42	0	\$0.00
Commission On The Arts	0	\$0.00	1	\$178,978.00
Correctional Industries	4	\$12,070,520.81	0	\$0.00
Dairy Products Commission	1	\$2,302,603.81	0	\$0.00
Deaf And Blind School	17	\$35,062,731.79	0	\$0.00
Department Of Agriculture	8	\$19,838,428.65	0	\$0.00
Department Of Corrections	108	\$566,438,167.20	3	\$200,920.57
Department Of Fish And Game	489	\$171,900,569.40	14	\$18,659,907.38
Department Of Juvenile Corrections	196	\$58,581,570.00	0	\$0.00



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State Agency	State-Owned Buildings		State-Leased Buildings	
	Count	Total RCV	Count	Total RCV
Department Of Labor	9	\$46,110,478.89	0	\$0.00
Department Of Lands	115	\$56,967,410.60	0	\$0.00
Department Of Parks And Recreation	242	\$50,186,765.63	0	\$0.00
Department Of Transportation	228	\$160,342,437.91	0	\$0.00
Department Of Transportation-Aeronautics	3	\$2,559,109.33	0	\$0.00
Department Of Water Resources	1	\$160,000.00	1	\$160,000.00
Dept Of Health & Welfare, Region I	1	\$612,066.78	0	\$0.00
Dept Of Health & Welfare, Region II	1	\$1,842,609.37	0	\$0.00
Dept. Of Health & Welfare, Region V	2	\$3,859,868.63	0	\$0.00
Dept. Of Health & Welfare, Region VI	3	\$7,875,177.04	0	\$0.00
Eastern Idaho Technical College	8	\$76,544,215.00	0	\$0.00
Historical Society	51	\$60,583,664.72	1	\$1,267,000.00
Idaho Barley Commission	0	\$0.00	1	\$10,506.25
Idaho Crop Improvement Association	5	\$1,875,876.43	0	\$0.00
Idaho State University	118	\$1,071,183,355.16	0	\$0.00
Idaho Wheat Commission	1	\$888,285.26	0	\$0.00
IDHW - Bureau Of Laboratories	1	\$19,366,868.46	0	\$0.00
IDHW - State Hospital North	14	\$19,793,422.66	0	\$0.00
IDHW - State Hospital South	14	\$50,573,433.71	0	\$0.00
IDHW - Welfare Medicaid Operations	1	\$113,140.82	0	\$0.00
IDHW Southwest Idaho Treatment Center	31	\$65,257,595.72	0	\$0.00
ISP - Idaho State Police	15	\$74,050,638.96	0	\$0.00
Lava Hot Springs Foundation	9	\$13,043,014.99	1	\$1,951,764.03
Lewis-Clark State College	41	\$228,497,893.63	0	\$0.00
Lewiston Veteran's Home	2	\$12,096,807.37	0	\$0.00
Lottery Commission	1	\$3,895.72	1	\$10,768.91
Military Division	66	\$69,641,655.34	4	\$373,540.28
Pocatello Veteran's Home	4	\$13,558,251.84	0	\$0.00
Public Employees Retirement System	2	\$12,602,746.90	0	\$0.00
Public Health District 1 (Panhandle)	7	\$17,949,010.90	0	\$0.00
Public Health District 2 (North Central)	5	\$10,948,556.63	0	\$0.00
Public Health District 3 (Southwest)	5	\$9,551,538.10	0	\$0.00
Public Health District 4 (Central)	3	\$10,807,899.14	0	\$0.00
Public Health District 5 (South Central)	5	\$8,898,081.47	0	\$0.00
Public Health District 6 (South Eastern)	3	\$8,479,572.26	0	\$0.00
Public Health District 7 (Eastern)	9	\$10,187,920.55	0	\$0.00
State Insurance Fund	2	\$21,023,875.13	0	\$0.00
State Liquor Division	1	\$14,451,435.11	0	\$0.00



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State Agency	State-Owned Buildings		State-Leased Buildings	
	Count	Total RCV	Count	Total RCV
University Of Idaho	581	\$1,534,822,342.19	9	\$96,313,825.81
Veterans State Cemetery	8	\$4,012,608.08	0	\$0.00
<b>Total</b>	<b>2,676</b>	<b>\$6,626,577,16.69</b>	<b>37</b>	<b>\$119,677,491.33</b>

RCV = Replacement Cost Value

**Table 3.F. Summary of State Facilities by County and Tribal Nation**

Jurisdiction	Owned		Leased	
	Count	Total RCV	Count	Total RCV
Ada County	577	\$3,028,250,309.86	12	\$78,780,137.65
Adams County	3	\$1,783,594.48	0	\$0.00
Bannock County	155	\$1,127,356,119.94	1	\$2,207,891.03
Bear Lake County	5	\$1,503,877.10	0	\$0.00
Benewah County	1	\$2,749,464.29	0	\$0.00
Bingham County	88	\$84,074,206.10	2	\$2,214,022.81
Blaine County	22	\$8,207,839.51	0	\$0.00
Boise County	17	\$4,168,485.36	0	\$0.00
Bonner County	62	\$22,881,146.38	2	\$689,687.11
Bonneville County	54	\$132,582,312.61	1	\$3,692,015.90
Boundary County	10	\$3,433,436.51	0	\$0.00
Butte County	0	\$0.00	0	\$0.00
Camas County	0	\$0.00	0	\$0.00
Canyon County	216	\$189,340,073.09	1	\$1,519,648.28
Caribou County	15	\$4,839,095.01	0	\$0.00
Cassia County	28	\$8,436,334.25	0	\$0.00
Clark County	1	\$264,006.69	1	\$63,431.69
Clearwater County	6	\$1,538,823.83	0	\$0.00
Coeur D'Alene Tribe	21	\$10,202,902.67	0	\$0.00
Custer County	19	\$6,429,722.79	0	\$0.00
Duck Valley Tribe	0	\$0.00	0	\$0.00
Elmore County	33	\$11,711,384.77	0	\$0.00
Fort Hall Tribe	1	\$4,546,934.35	0	\$0.00
Franklin County	7	\$3,269,025.15	0	\$0.00
Fremont County	191	\$88,105,556.12	0	\$0.00
Gem County	8	\$2,102,570.60	0	\$0.00



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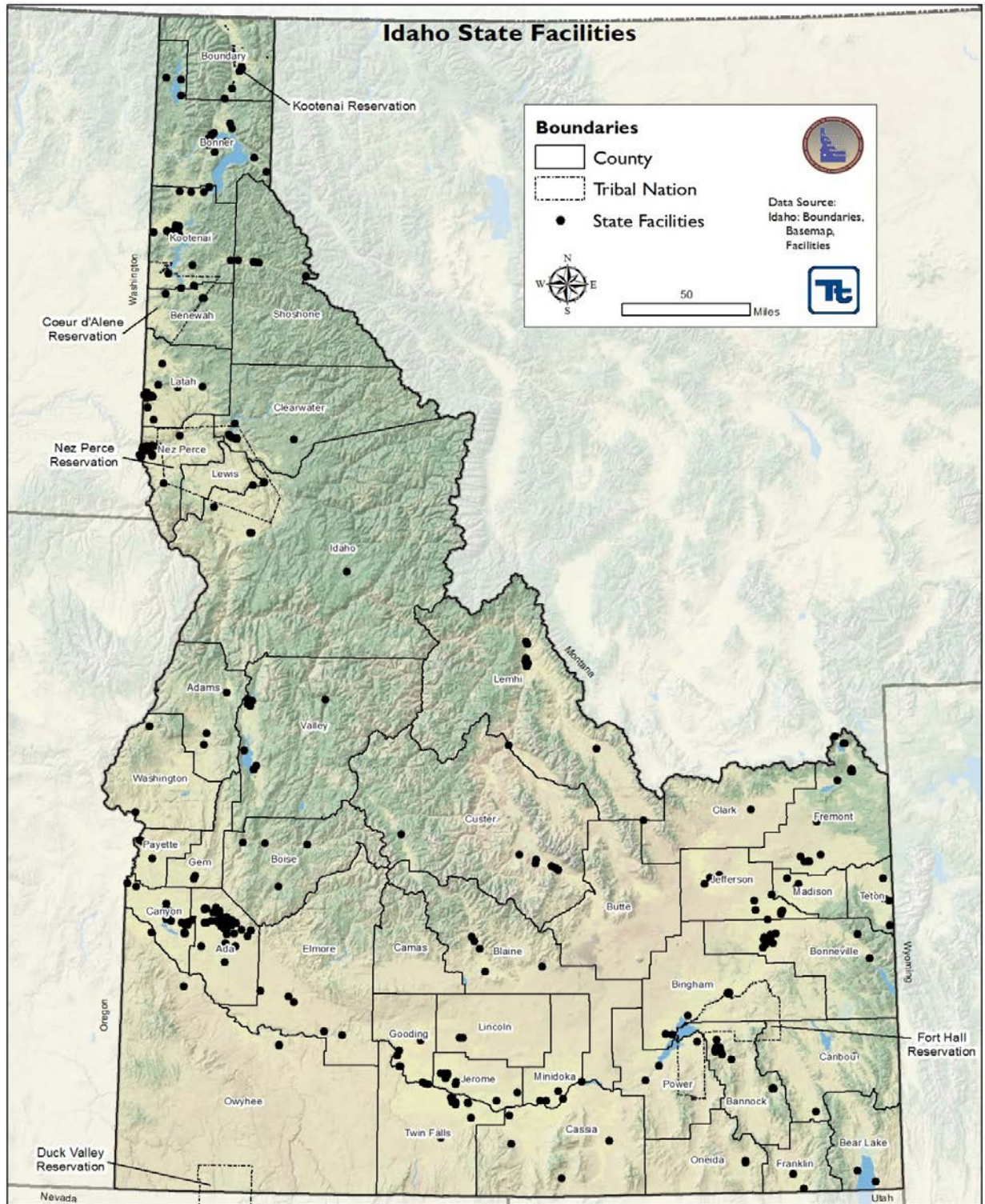
Jurisdiction	Owned		Leased	
	Count	Total RCV	Count	Total RCV
Gooding County	88	\$63,577,955.50	0	\$0.00
Idaho County	27	\$22,327,668.99	0	\$0.00
Jefferson County	49	\$25,472,196.22	1	\$266,633.25
Jerome County	15	\$11,085,104.19	3	\$3,410,867.92
Kootenai County	70	\$87,823,009.45	1	\$430,293.85
Kootenai Tribe	0	\$0.00	0	\$0.00
Latah County	383	\$1,687,274,914.47	7	\$27,186,884.43
Lemhi County	46	\$13,988,120.74	2	\$2,429,752.67
Lewis County	0	\$0.00	0	\$0.00
Lincoln County	20	\$11,771,192.50	0	\$0.00
Madison County	4	\$3,771,106.76	0	\$0.00
Minidoka County	9	\$6,570,672.21	0	\$0.00
Nez Perce County	132	\$314,500,931.89	3	\$5,458,126.84
Nez Perce Tribe	62	\$36,917,103.61	0	\$0.00
Oneida County	2	\$832,428.14	0	\$0.00
Owyhee County	12	\$3,408,158.88	0	\$0.00
Payette County	7	\$4,173,531.62	0	\$0.00
Power County	33	\$10,214,646.95	0	\$0.00
Shoshone County	8	\$2,860,352.57	0	\$0.00
Teton County	27	\$12,187,781.22	0	\$0.00
Twin Falls County	63	\$93,364,670.35	0	\$0.00
Valley County	58	\$17,149,103.19	0	\$0.00
Washington County	21	\$5,866,576.68	0	\$0.00
<b>Idaho Total</b>	<b>2,676</b>	<b>\$7,182,914,447.59</b>	<b>37</b>	<b>\$128,349,393.43</b>

RCV = Replacement Cost Value



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Figure 3.G. State-Owned and –Leased Assets Used in the Risk Assessment



Source: Risk Management Technical Records



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## Critical Facilities and Infrastructure

For this 2018 SHMP update, the State defined a critical facility for the purposes of the State Hazard Mitigation Plan as follows:

Critical infrastructure is defined as the physical and cyber systems and assets so vital to the local, state, and federal government that their incapacity or destruction would have a debilitating impact on the physical or economic security or public health or safety of local government, the State of Idaho, or the United States. This includes the following eighteen sectors:

- Food and Agriculture • Banking and Finance • Chemical • Commercial Facilities
- Communications • Critical Manufacturing • Dams • Defense Industrial Base
- Emergency Services • Energy • Government Facilities • Healthcare and Public Health
- Information Technology • National Monuments and Icons • Nuclear Reactors, Materials, and Waste • Postal and Shipping
- Transportation Systems • Water

The National Infrastructure Protection Plan (NIPP) and the supporting sector specific plans identify roles and responsibilities for both state and local governments as well as the private sector. The most important roles and responsibilities from the state perspective include:

- Acting as a focal point for promoting the coordination of protective, mitigation, emergency response activities, preparedness programs, and resource support among local jurisdictions and private sector partners.
- Develop a consistent approach to critical infrastructure and key resource (CI-KR) identification, risk determination, mitigation planning, and prioritized security investments.
- Identify, implement, and monitor a risk management plan and take corrective actions as appropriate.
- Address unique geographical issues, including trans-border concerns, dependencies, and interdependencies among the sectors within the State of Idaho.

The critical facility inventory data collection was led by the Idaho Office of Emergency Management Geographic Information Systems (GIS) Section Chief. To compile an updated critical facility inventory, the following data sources were used in priority order: 1) The Homeland Security Infrastructure Program



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(HSIP) data; 2) Idaho Department of Water Resource, 3) Idaho Counties Risk Management Program (ICRMP) data; 4) additional Idaho Office of Emergency Management GIS files. Table 3.H summarizes the critical facilities and infrastructure types and data sources used for this planning effort. Table 3.I summarizes the number of critical facilities per county and Tribal Nation.

**Table 3.H. Critical Facilities and Infrastructure Types and Data Sources**

Critical Facilities		Critical Infrastructure	
Type	Spatial Data Source	Type	Spatial Data Source
Administration Building	ICRMP	Lodges	ICRMP
Airport	ICRMP	Maintenance Buildings	ICRMP
Amtrak - Bus	HSIP	Manual Arts Building	ICRMP
Amtrak - Rail	HSIP	National Gas Compressor	HSIP
Apartment	ICRMP	Natural Gas Facility	Idaho
Armory	ICRMP	Natural Gas Market	HSIP
Assembly	ICRMP	Office Building	ICRMP
Bank	ICRMP	Pavilions	ICRMP
Barn	ICRMP	Petroleum Pump	HSIP
Biodiesel	HSIP	Police	HSIP
City Hall	Idaho	Power Plant	HSIP
Clubhouse	ICRMP	Public	ICRMP
Cold Storage Warehouse	ICRMP	Public Health	HSIP
College	HSIP	Public Libraries	ICRMP
Commercial	ICRMP	Pump House	ICRMP
Community Building	ICRMP	Radio Tower	ICRMP
Community Recreation Center	ICRMP	Recreational	ICRMP
Community Service Buildings	ICRMP	Reservoir	ICRMP
Correctional	Idaho	Residential	ICRMP
Dams	IDWR	Restroom	ICRMP
Day Care	HSIP	Retail	ICRMP
Electric Substation	HSIP	School	HSIP
EMS	HSIP	Service Garage	ICRMP
Equipment Storage Building	ICRMP	Sewer	ICRMP
Ethanol	HSIP	Shelter	ICRMP
Fairground	ICRMP	Shower Building	ICRMP
Farm	ICRMP	Solid Waste	ICRMP
Fine Arts	ICRMP	Storage Warehouse	ICRMP
Fire	HSIP	Supermarket	ICRMP
Food Service	ICRMP	Supplemental College	HSIP
Governmental Building	ICRMP	Vacant Land	ICRMP
Grand Stand	ICRMP	Veterinary Hospital	ICRMP
Gymnasium	ICRMP	Water	ICRMP





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Critical Facilities		Critical Infrastructure	
Type	Spatial Data Source	Type	Spatial Data Source
Hanger, Maint & Office	ICRMP	Water Plant	ICRMP
Hospital	HSIP	Water Tank	ICRMP
Industrial	ICRMP	Well	ICRMP
Intermodal Transit	HSIP	Yard Structure	ICRMP
Local EOC	HSIP		

Notes:

Table 3.1. Number of Critical Facilities by County and Tribal Nation

Jurisdiction	Number of Critical Facilities	Jurisdiction	Number of Critical Facilities
Ada County	1,078	Gem County	204
Adams County	96	Gooding County	216
Bannock County	513	Idaho County	197
Bear Lake County	152	Jefferson County	187
Benewah County	67	Jerome County	236
Bingham County	334	Kootenai County	758
Blaine County	320	Kootenai Tribe	0
Boise County	157	Latah County	366
Bonner County	466	Lemhi County	182
Bonneville County	493	Lewis County	0
Boundary County	206	Lincoln County	129
Butte County	80	Madison County	173
Camas County	41	Minidoka County	196
Canyon County	961	Nez Perce County	116
Caribou County	220	Nez Perce Tribe	335
Cassia County	272	Oneida County	111
Clark County	66	Owyhee County	252
Clearwater County	114	Payette County	267
Coeur D'Alene Tribe	126	Power County	161
Custer County	122	Shoshone County	210
Duck Valley Tribe	1	Teton County	111
Elmore County	374	Twin Falls County	761
Fort Hall Tribe	34	Valley County	314
Franklin County	207	Washington County	241
Fremont County	228	<b>Idaho Total</b>	<b>12,451</b>

Notes: Critical facilities in Lewis County are located within Nez Perce Reservation

Similar to state assets, a spatial analysis was conducted in GIS using the best available hazard data and the critical facilities inventory to determine exposure to the identified hazard. When the analysis



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determined the facility is located in the hazard area, it was deemed exposed to the hazard and potentially vulnerable. The replacement cost value was not available for critical facilities and therefore losses were not estimated. Additional details regarding the methodology used to assess critical facility exposure and vulnerability are presented in each hazard section.

### ***Assessment of Local Vulnerability***

To assess the vulnerability of jurisdictions to the identified hazards of concern, a spatial analysis was conducted. Overall, the exposure and potential losses to population and buildings was evaluated to determine the jurisdictions most threatened by each hazard of concern. The default HAZUS-MH building inventory was at the U.S. Census-block or tract level was used for the purposes of this analysis. Where spatially-delineated hazard data was not available, a qualitative discussion summarizes the vulnerability of jurisdictions to the hazard of concern.

### **Estimating Potential Losses to State Assets and Jurisdictions**

To address the requirements of 44 CFR 201.4 and better understand potential losses associated with the hazards of concern, standardized tools combined with local, state, and federal data and expertise were used to conduct the risk assessment. A brief description of the methodology used to support estimating potential losses to jurisdictions and state assets is described below. The vulnerability assessment section in each hazard section summarizes the detailed methodology used for each particular hazard of concern.

### **Hazards U.S. (HAZUS)**

In 1997, FEMA developed a standardized model for estimating losses caused by earthquakes, known as Hazards U.S. or HAZUS. HAZUS was developed in response to the need for more effective national-, state-, and community-level planning, and the need to identify areas that face the highest risk and potential for loss. HAZUS was expanded into a multi-hazard tool (HAZUS-MH) with new models for estimating potential losses from wind (hurricanes) and flood (riverine and coastal) hazards. HAZUS-MH is a GIS-based software tool that applies engineering and scientific risk calculations that have been developed by hazard and information technology experts, to provide defensible damage and loss estimates. These methodologies are accepted by FEMA and provide a consistent framework for assessing risk across a variety of hazards. The GIS framework also supports the evaluation of hazards and assessment of inventory and loss estimates for these hazards.

HAZUS-MH uses GIS technology to produce detailed maps and analytical reports that estimate a community's direct physical damage to building stock, critical facilities, transportation systems, and utility systems. To generate this information, HAZUS-MH uses default data provided by HAZUS-MH for inventory, vulnerability, and hazards; this default data can be supplemented with local data to provide a more refined analysis. Damage reports can include induced damage (inundation, fire, and threats posed by hazardous materials and debris) and direct economic and social losses (casualties, shelter requirements, and economic impact) depending on the hazard and available local data. HAZUS-MH's open data architecture can be used to manage community GIS data in a central location. The use of this software also promotes consistency of data output now and in the future and standardization of data collection and storage. The guidance "Using HAZUS-MH for Risk Assessment: How-to Guide (FEMA 433)" was used to support the application of



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HAZUS-MH for this risk assessment and Plan. More information on HAZUS-MH is available at <https://www.fema.gov/hazus>.

As noted in the HAZUS-MH User Manual, “Uncertainties are inherent in any loss estimation methodology. They arise in part from incomplete scientific knowledge concerning earthquakes and their effects upon buildings and facilities. They also result from the approximations and simplifications that are necessary for comprehensive analyses. Incomplete or inaccurate inventories of the built environment, demographics, and economic parameters add to the uncertainty. These factors can result in a range of uncertainty in loss estimates produced by the HAZUS Earthquake Model, possibly at best a factor of 2 or more.” However, HAZUS potential loss estimates are acceptable for the purposes of this Hazard Mitigation Plan.

HAZUS-MH was updated with the State-owned and leased buildings and critical facilities as user-defined facilities. The default population and aggregate building inventory was used and is based on the 2010 United States Census data. The 2010 Census block population data was used to evaluate population exposure, and the aggregate building inventory was used to evaluate building stock exposure.

A probabilistic analysis was conducted to estimate potential flood losses resulting from the 1-percent annual chance flood event. The analysis was performed by county for counties with available flood hazard data. Refer to Table 3.2.Y in the vulnerability assessment of Flood 3.2 for a list of digitized flood data available for the analysis. Losses were estimated utilizing the dasymetric dataset in HAZUS-MH version 4.0.

Four scenario-based events were used to evaluate the earthquake hazard. Three USGS ShakeMap scenarios, Squaw Creek M7.0, Lemhi M7.0, and Eastern Bear Lake M7.3, along with the historic Borah Peak event M6.9 (10/28/1983) available in HAZUS-MH v4.0 were used to estimate earthquake potential losses at the Census tract level.

### Hazard-Specific Methodologies

The vulnerability assessment section in each hazard section summarizes the detailed methodology and data used for that particular hazard of concern. For hazards in which HAZUS-MH could not be used, an exposure-based methodology was applied using the best available spatial data gathered from the State’s subject-matter experts (SME), as well as the default demographic and general building stock in HAZUS-MH, state assets and critical facilities and infrastructure.

### Changing Conditions

An understanding of population and development trends can assist in planning for future development and ensuring that appropriate mitigation, planning, and preparedness measures are in place. In addition, reflecting on changes since the previous plan will provide an understanding of changes in risk. The State considered the following factors to examine previous and potential conditions that may affect hazard vulnerability:



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- Potential or projected development
- Projected changes in population
- Other identified conditions as relevant and appropriate

The U.S. EPA's Integrated Climate and Land-Use Scenarios (ICLUS) project generated projected population and land use projections for the United States through 2100. The project examined multiple scenarios taking into account various population growth and economic development parameters that have been used as the baseline for the Intergovernmental Panel on Climate Change's (IPCC) Special Report on emissions Scenarios (SRES). Population change took into account assumptions regarding fertility, mortality, and immigration, which was then used to drive the land use projections. The SRES provides two development scenarios: economic development (A) and environmentally-driven development (B), where the A scenario will result in more sprawled development, and the B scenario will result in more compact developments close to the existing urban centers. Additionally, the model scenarios included parameters for global development (1) and regional development (2) (EPA, 2013). The model estimated projections for each decade from 2010 to 2100.

The ICLUS scenario 'A2' was selected to examine if changes in land use and housing density estimates from 2010 to 2020 are projected in the wildfire hazard area. The 2010 data was used as a baseline to determine if any changes in development by 2020 may result in increases or decreases in the hazard area. The resulting housing density and land use categories are defined as follows: Urban, which equates to 0.25 acres/unit; Suburban, which equates to 0.25 to 2 acres/unit; Exurban, which equates to 2 to 40 acres/unit; Rural, which equates to 40 acres/unit; Commercial and Industrial.

### Statewide Vulnerability Summary

Flood, earthquake, and wildfire are significant hazards in Idaho, and these were determined to be the most significant for the 2007, 2010, and 2013 SHMPs. Like the 2013 SHMP, one of the main contributing factors is each hazard's ability to inflict major structural damages and impacts to the population. This conclusion was determined again based on: the types of recent major disaster declarations as well as other past occurrences, an assessment of the types of historical disaster declarations, and the results of the vulnerability and loss assessments, as well as integrating the results of the 2015 Idaho Multi-Hazard Risk Portfolio.

The relationship between these hazards and the other natural hazards also validates this ranking. Landslide and avalanche events can occur independent of other hazards. These events are generally relatively localized and have a low impact. However, these hazards may also be induced by other hazard events potentially compounding the impacts. For example, an earthquake event may cause a landslide and/or an avalanche leading to even greater potential losses than from just the ground shaking.

The severe storm hazard ranked in the top three hazards for the 2018 SHMP update, and it is almost always associated with other hazard types, especially flooding. There is also potential for a lightning strike associated with a severe storm to ignite a wildfire. The impacts of a dam failure or levee failure event can



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be significant; however, the damages will result from the subsequent flooding that occurs, and the statewide risk to these events is included in the flood risk.

Droughts have the ability to cause widespread economic losses to the agriculture industry and a reduction in the quality of life as a result of water shortages. The event itself will not have a major impact in regards to physical damages though. Mass physical damages are possible during drought event, if a secondary wildfire event due to dry and dead vegetation is ignited. Volcanoes have the potential for widespread losses to life and property, but eruptions are usually far apart in time and the extent of an eruption is difficult to predict for mitigation purposes.

Overall, civil disturbance, cyber disruption, pandemic, and radiological have a greater propensity to affect populations rather than inflicting physical damages, though physical damages are still possible. With the exception of a statewide pandemic or widespread nuclear event, incidents of these hazards will be localized and only affect the immediate area. The rarity of such significant pandemic and nuclear events is low, therefore these hazards, along with civil disturbance and cyber disruption are not deemed as significant at the State level as wildfires, floods, and severe storms.



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