



CHAPTER 2 STATE OF IDAHO PROFILE

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GEOGRAPHY AND ENVIRONMENT

The State of Idaho covers 83,564 square miles, with a land area of 82,412 square miles and 1,152 square miles of water. Its northeastern boundary is Montana, with Wyoming on the east, Utah and Nevada on the south, Oregon and Washington on the west, and British Columbia, Canada on the north. It has forests, deserts, mountains, narrow valleys, and plains. Altitudes range from 738 feet above sea level at the shores of the Snake River in Lewiston to 12,662 feet at the summit of Borah Peak. Steep mountain streams and large, forceful rivers are found throughout. With a 600-mile north-south profile, it has a vast exposure to the dominant westerly flow of weather, and its climatic characteristics vary not only from north to south, but from east to west. The geology, hydrography, climate, and land cover all play a role in the natural hazard environment that characterizes our State.



Source: Flickr

Geology and Terrain

Idaho features a diverse and dramatic geologic setting. Throughout much of the State, outcroppings, steep slopes, and high relief make the residents very aware of the foundation of the State. This diversity



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also makes for a geologically active State, with earth movement through earthquakes and landslides, large and small, still shaping the terrain.

Northern and central Idaho is mountainous, with peaks reaching elevations over 12,000 feet. The continental divide runs along the lower portion of the border with Montana. The landscape is characterized by large changes in elevation in short distances (over 4,000 feet in some cases), steep slopes, and narrow V-shaped valleys. Past glaciations are evident in some areas. The northern portion of the State is underlain with ancient (1.4 billion years old) metamorphic rocks with pronounced layering. Major mountain ranges include the Selkirk, Coeur d'Alene, and Cabinet Mountains.

Central Idaho is underlain by the Idaho Batholith, a 70- to 100-million-year-old and deeply eroded complex of coarse-grained granitic rocks. This area is marked by massive mountain ranges such as the Sawtooth, Salmon River, and Bitterroots. The deeply eroded canyon of the westward-flowing reach of the Salmon River bisects this area. In both regions, the exposed rocks present an unstable terrain subject to slides and rock falls, and the landscape has been and is being formed by these factors. Soils formed from the granitic rocks of Central Idaho are given to instability after vegetation disturbance from wildland fires or logging.

The southern portion of the State, in contrast, is characterized by the broad basalt plains that are deeply cut by river valleys. This rock is part of one of the largest basaltic lava flows in North America and is quite young (geologically speaking). Although the volcanoes are now dormant, there is a possibility of renewed lava flows in the future. Where it is exposed as tablelands and steep cliffs, this type of rock is also unstable and given to slides and rock falls.

The subsurface geology of Idaho creates the potential for seismic activity throughout the State. Only the northernmost portion of the State (the Panhandle) and a belt running from the southwest to Rexburg in the east (corresponding somewhat to the Snake River Plain) are considered relatively inactive. The key phrase is "relatively," though; it is important to note that the entire State is considered to have at least a moderate seismic threat, and earthquakes can occur anywhere.

Climate

Idaho, although also diverse in climate, is generally characterized by warm, dry summers and cold, moist winters. Flanked by the Cascade Range on the west and the Rocky Mountains on the east, the State is shielded from the significant precipitation found on the Pacific coast and the severe arctic cold spells and destructive summer storms found on the Great Plains. In general, violent or prolonged adverse weather events (e.g., tornadoes and extended winter storms) are rare.

The State's annual average precipitation is 22 inches, but there is significant variation. The considerable north-south extent of the State (seven degrees of latitude) and lifting of air masses over the mountainous areas results in heavy precipitation in the north and in the central Idaho mountains (up to 60 inches, much as snow) and low precipitation in the downwind, "rain shadow" southern and eastern



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areas (down to 10 inches). Winter snowfall ranges from a low of 20 inches in the southwestern valleys and canyons to a record of 300 inches (and perhaps up to 400 inches) in the high mountains.

November, December, and January are generally the wettest months of the year in most Idaho locations. In the central and northern half of the State, a second cycle of precipitation usually occurs during spring. Spring and summer thunderstorm activity provides much of the moisture for the eastern communities located in the rain shadow of the central mountain mass. Idaho’s significant north-south extent and altitudinal variations also influence temperatures, with the highest summer temperatures occurring in the south. Further from the moderating influences of the Pacific Ocean and generally higher in elevation, the southeastern corner of the State is cooler than the southwestern corner. Representative locations are described in the Table 2.A below.

TABLE 2.A: Representative Climate Examples

City	Elevation (feet above sea level)	Annual Mean Precipitation	Mean Snowfall	July Average High Temperature (Fahrenheit)	January Average Low Temperature (Fahrenheit)	July Average Afternoon Humidity
Boise	2,840 ft.	12.1 in.	21.3 in.	90.2	21.6	22%
Coeur d’Alene	2,158 ft.	25.9 in.	52.2 in.	85.4	23.3	34%
Idaho Falls	4,730 ft.	10.9 in.	37.5 in.	86	10	25%
Lewiston	1,440 ft.	12.4 in.	19.8 in.	89	27.6	34%
Pocatello	4,450 ft.	12.1 in.	47.2 in.	88.1	14.4	38%
Twin Falls	3,670 ft.	10.4 in.	31.3 in.	85	18.6	27%

Water Bodies and Streams

Idaho’s water bodies and streams play a key role in its natural hazard climate. Large rivers are found throughout the State and, due to the rugged terrain, they often share their floodplains with development. Most Idaho residents live near rivers that are subject to periodic flooding.

Much of Idaho’s precipitation falls as snow, leading to a stream flow pattern keyed to spring and early summer snow melt. In general, stream flows are highest during this period and lowest in fall and winter.

Extensive water storage facilities (over 12 million acre-feet of storage) in the State modify this pattern, especially downstream along the larger rivers. These facilities and offstream use of the water can significantly alter the natural flow patterns.

The Snake River, cutting across the width of the southern portion of the State, is a key feature in the Idaho – its basin covers 88 percent of the State. The river is impounded at Palisades Reservoir upon



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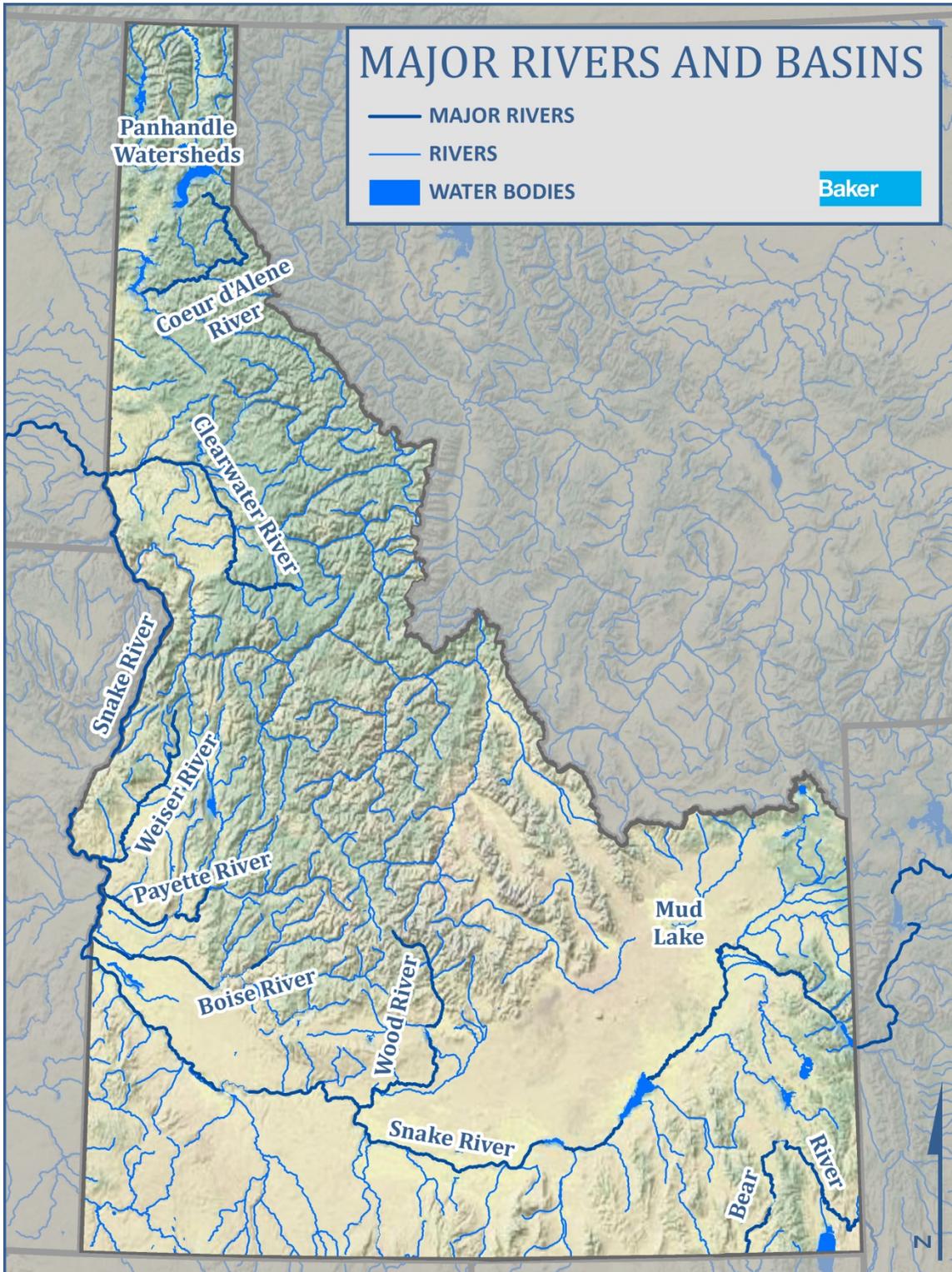
entering the State from Wyoming and then flows from the reservoir onto the Snake River Plain. The river curves across southern Idaho through the State's largest valley, where the river may be completely depleted by irrigation diversions during the summer. Continuing west, the flow is replenished by the Snake Plain aquifer (groundwater comprises up to one-half of the flow at Glenn's Ferry). It then turns north to form the western boundary and travels through Hell's Canyon (the deepest canyon in North America) before turning west into Washington State at Lewiston. As it enters Hell's Canyon, the Snake is altered by river regulation for hydropower production and inflow from the Boise and Payette Rivers.

Major tributaries, such as the Salmon and the Clearwater, begin in the mountains of Central Idaho as small, steep streams and often maintain a relative steepness throughout their courses. Idaho's lakes include Dworshak Lake, a 53-mile long reservoir, and numerous alpine lakes in the high mountains. Two Panhandle rivers, Kootenai and Clark Fork, are regulated by dams upstream in Montana. Flood control and power production increase the flows from late summer through winter. The Clark Fork is also controlled by the Cabinet Gorge dam, whose power operations produce daily fluctuations (along with the Noxon Rapids Dam in Montana). The Spokane River flows west from Lake Coeur d'Alene, one of the State's largest lakes, passing quickly out of the State at Post Falls. Two major tributaries, Coeur d'Alene and the St Joe, originate in Idaho's Bitterroot Range and flow into Lake Coeur d'Alene. Other large lakes in the northern Panhandle include Priest and Pend Oreille, the largest lake in Idaho. These lakes are regulated by dams at their outlets. In general, lake levels are lowered in the late fall to provide for winter flood protection. Smaller lakes include Hayden Lake, Spirit Lake, the Upper and Lower Twin Lakes, and Hauser Lake.

The Bear River enters the State near Bear Lake, having drained a 2,500-square-mile, somewhat mountainous basin. At that point, it is regulated by upstream storage and is depleted by irrigation diversions in Wyoming and Utah. High flows are common in May and June, and very low flows in July, August, and September. Through Idaho, it is affected by reservoir releases for power generation, unregulated tributary inflow, and irrigation diversions. Its major tributaries, Thomas Fork and the Malad River, exhibit flows typical of unregulated streams. Peak runoff occurs during the snowmelt season and declines through the summer months. Major rivers and water bodies are shown on Map 2.B. Map 2.C also depicts all of the watershed sub-basins across the state.



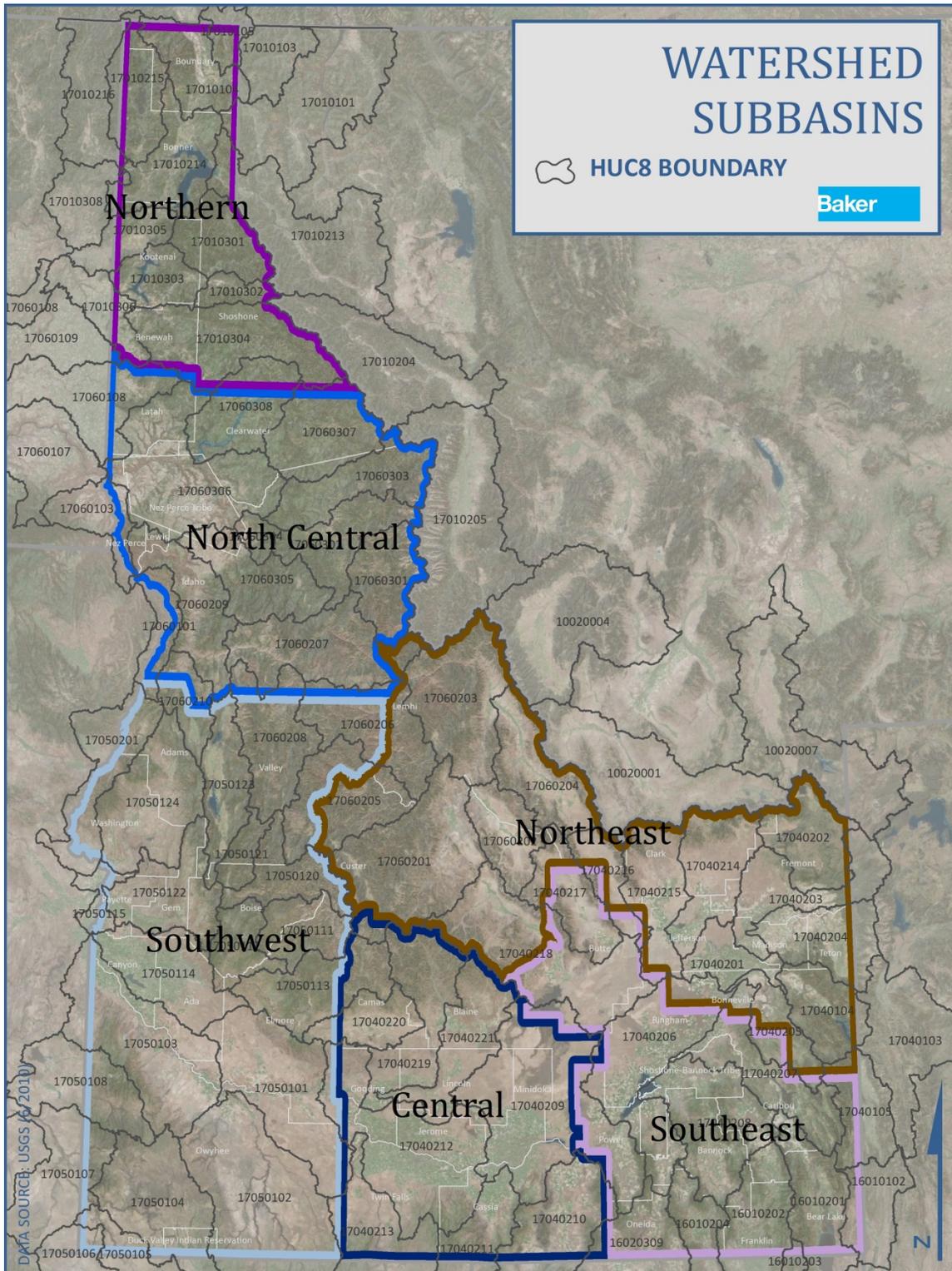
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Map 2.B: Major Rivers and Basins of Idaho



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Map 2.C: Watershed Sub-basins of Idaho



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POPULATION

Idaho is the 39th most populated state in the country. According to recent US Census estimates, the 2012 residential population of Idaho was 1,595,728 people. From 2010 to 2012, Idaho ranked 21st among the states in population growth at 1.8 percent, or over 28,000 people. As of July 2013, the growth rate of Idaho was 0.8 percent, the same as experienced in 2011 and the slowest since 2006 when population growth reached its peak of 2.8 percent. Although the recession slowed migration to the state, Idaho remained the 39th most populous state in 2012.

Below, Table 2.D depicts 2010 and 2012 Idaho population estimates by county. The most populous county in Idaho is Ada County, with a 2012 estimated population of 409,061. Clark County, with a population of 869, is the least populated county in the state.

TABLE 2.D: Summary of 2010 and 2012 Census Population Estimates by County

County	2010 Census Population	2012 Census Population Estimates	County	2010 Census Population	2012 Census Population Estimates
Ada County	392,365	409,061	Gem County	16,719	16,673
Adams County	3,976	3,915	Gooding County	15,464	15,291
Bannock County	82,839	83,800	Idaho County	16,267	16,308
Bear Lake County	5,986	5,907	Jefferson County	26,140	26,684
Benewah County	9,285	9,117	Jerome County	22,374	22,499
Bingham County	45,607	45,474	Kootenai County	138,494	142,357
Blaine County	21,376	21,146	Latah County	37,244	38,184
Boise County	7,028	6,835	Lemhi County	7,936	7,758
Bonner County	40,877	40,476	Lewis County	3,821	3,889
Bonneville County	104,234	106,684	Lincoln County	5,208	5,277
Boundary County	10,972	10,808	Madison County	37,536	37,456
Butte County	2,891	2,740	Minidoka County	20,069	20,037
Camas County	1,117	1,077	Nez Perce County	39,265	39,531
Canyon County	188,923	193,888	Oneida County	4,286	4,215
Caribou County	6,963	6,787	Owyhee County	11,526	11,439



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TABLE 2.D: Summary of 2010 and 2012 Census Population Estimates by County

County	2010 Census Population	2012 Census Population Estimates	County	2010 Census Population	2012 Census Population Estimates
Cassia County	22,952	23,249	Payette County	22,623	22,639
Clark County	982	869	Power County	7,817	7,778
Clearwater County	8,761	8,590	Shoshone County	12,765	12,702
Custer County	4,368	4,331	Teton County	10,170	10,052
Elmore County	27,038	26,223	Twin Falls County	77,230	78,595
Franklin County	12,786	12,786	Valley County	9,862	9,545
Fremont County	13,242	12,957	Washington County	10,198	10,099

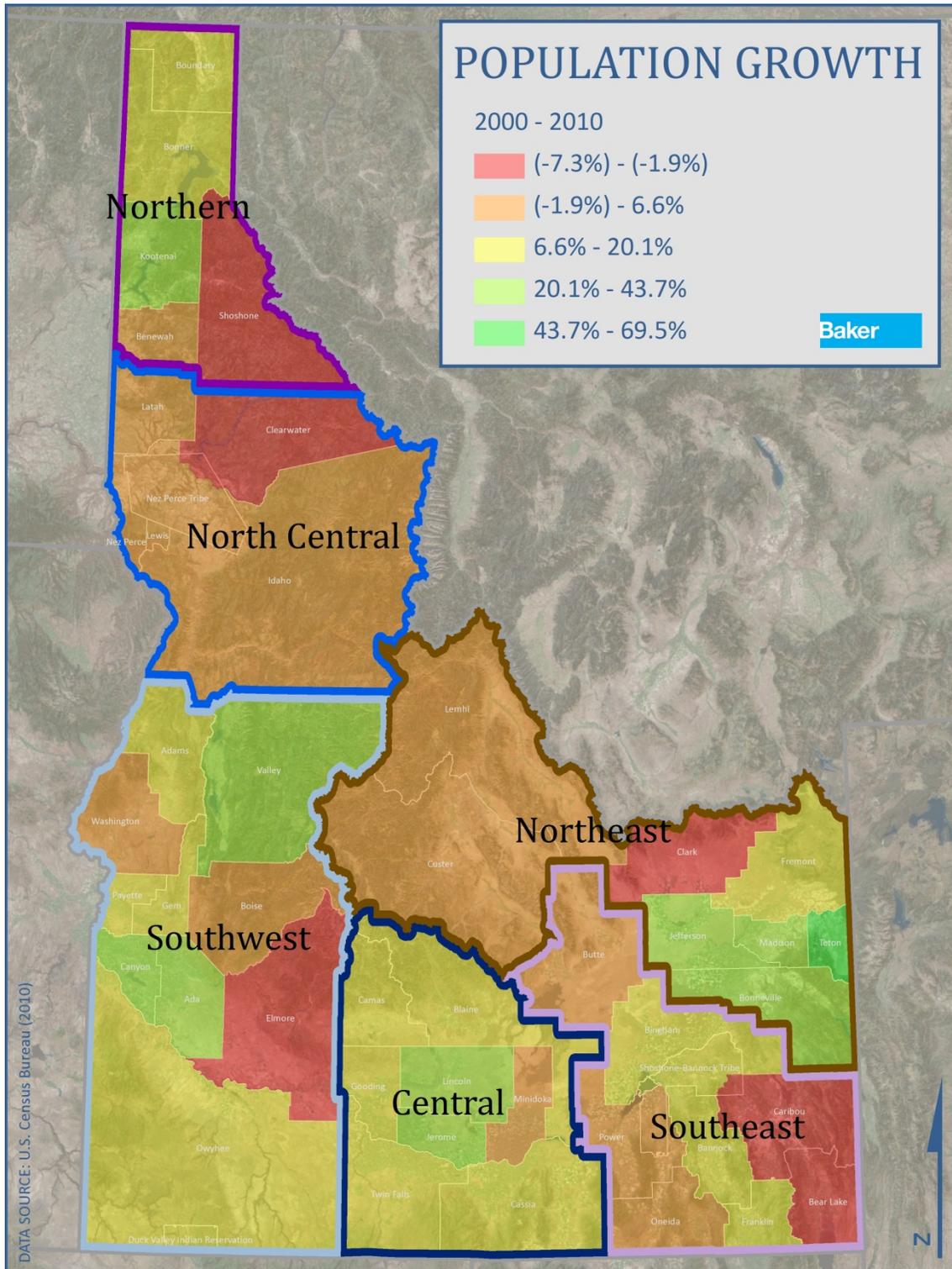
Between 2000 and 2012 the county with the largest population growth rate was Teton County (69.5 percent growth). Eight counties experienced negative population growth rates: Butte, Minidoka, Clearwater, Clark, Caribou, Bear Lake, Elmore and Shoshone Counties. Shoshone County had the largest rate of negative growth in the state (-7.3 percent growth).

Since 2010, Idaho’s population growth has been concentrated primarily in urban areas. To differentiate between urban and rural, the Idaho Department of Commerce and Labor defines urban counties as those containing a town or city with a population of at least 20,000 residents. The largest towns or cities in rural counties have fewer than 20,000 residents. Under this definition Ada, Canyon, Kootenai, Bonneville, Bannock, Twin Falls, Bingham, Bonner, Nez Pierce, Latah, Madison, Jefferson, Elmore, Cassia, Payette, Jerome, Blaine and Minidoka counties are urban counties. Since the 2009 Idaho Hazard Mitigation Plan, nine new counties have been added to the list of urban-sized counties: Bingham, Bonner, Jefferson, Elmore, Cassia, Payette, Jerome, Blaine and Minidoka.

Below, Map 2.E below depicts population growth in Idaho’s 44 counties between 2000 and 2010. Although five out of six of the hazard mitigation regions experienced some amount of population decline, the North-Central area of the state had the largest amount of negative growth. The Southwest region experienced the most growth in population.



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Map 2.E: Idaho Population Growth from 2000 - 2010



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According to the Idaho Department of Labor, the state is projected to continue to grow. Rural growth trends, however, are less positive. Between 2000 and 2003, thirteen rural counties lost population. These post-2000 trends are consistent with trends reflected in rural areas nationwide. Counties that are losing population, or growing at a slow pace, tend to be very remote or have yet to recover from declines in historically important industries. The demographic make-up of the state’s rural areas is steadily changing. In the southern part of the state, Hispanics account for a growing share of the rural population. Additionally, the share of the population 65 years or older is increasing. Nine out of the 10 counties with the highest proportion of people in this age group are rural counties.

The City of Boise is the largest city in Idaho with a population of 212,303 people (Census 2010 population 2012 estimate). The second most populous city is Nampa with a population of 83,930 people (Census 2010 population 2012 estimate). Table 2.F lists most the populated cities in Idaho.

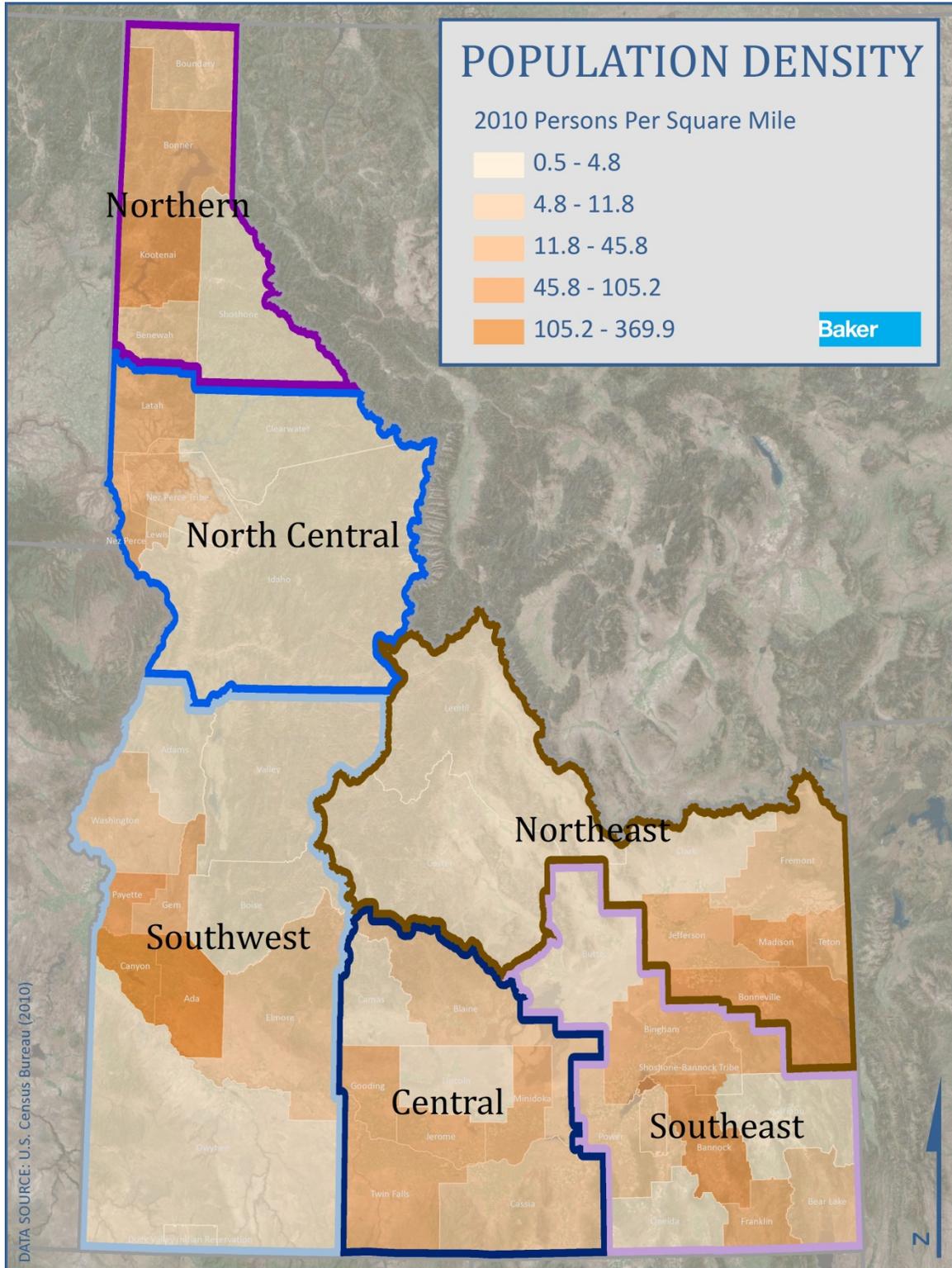
Table 2.F: Most Populated Cities of Idaho	
City	2012 Population Estimates ¹
Boise	212,303
Nampa	83,930
Meridian	80,386
Idaho Falls	57,899
Pocatello	54,777
Coeur d'Alene	45,579
Caldwell	47,668
Twin Falls	45,158
Lewiston	32,051
Post Falls	28,651
Rexburg	25,732
Moscow	24,499

In Idaho, population densities are highest in and around cities. Below, Map 2.G shows 2010 population densities throughout the state of Idaho based on Census 2010 estimates.

¹ US Census 2010



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Map 2.G: 2010 Idaho Population Density



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Population density has a strong correlation with hazard vulnerability and loss. For example, urban areas like Boise and Nampa (as well as the cities listed in Table 2.F) naturally have larger populations and numbers of structures; therefore, they are expected to experience greater loss during hazard events. The northern county of Kootenai (home to Coeur d'Alene) and the southwestern counties of Ada and Canyon (home to Boise and Nampa, respectively) have the greatest population densities in the state.

LAND USE AND DEVELOPMENT TRENDS

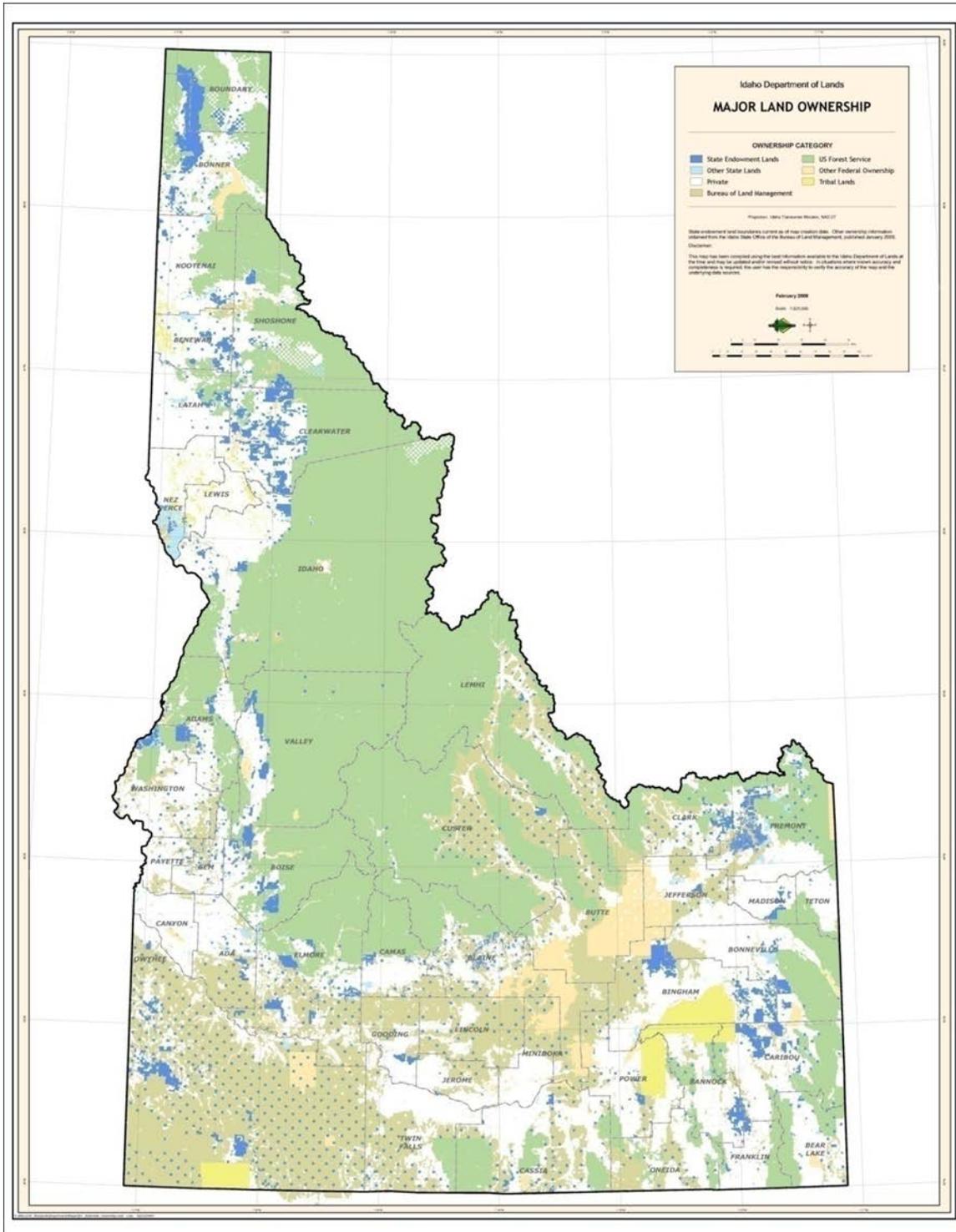
The State of Idaho has a variety of land uses, ranging from agricultural to industrial. Agriculture has been the backbone of Idaho's economy for many years, since before the area became a State. Although Idaho's growing season is about 200 days long around the city of Lewiston, it can be very brief at high altitudes. With no hurricanes and infrequent tornadoes, crop damage due to weather is minimal across the state, with limited damage from hail and wind storms. Idaho's greatest threats to crops remain drought and invasive species. According to the United States Department of Agriculture, approximately 11,497,383 acres of land were used for agricultural purposes in 2007 and agriculture comprises 21.7 percent of the State's land use.

Forests cover approximately 26,600,000 acres and make up 41 percent of Idaho's land cover. According to the Idaho Forest Products Commission, approximately 89.6 percent of the forestland existing in 1630 is still present today. The United States government owns 63.8 percent of all the land in Idaho and manages nearly three-quarters of the Idaho forest. The rest of Idaho's forestland is divided between public and private ownership. The State of Idaho and other public agencies own 10 percent, or 2.2 million acres; forest products companies own 5 percent, or 1.1 million acres; and the remaining 10 percent, 2.2 million acres, is owned by ranchers, farmers, tribes, and other private landowners. Map 2.H on the following page shows land ownership in the State.

Land cover significantly affects hazard vulnerability in Idaho. For example, counties with a large percentage of forest cover, such as those that contain the Clearwater National Forest, are more susceptible to wildfire hazards and also some invasive species. Map 2.I displays land use cover across Idaho, including urban or built-up areas. As urbanization continues across the state, areas that were once covered by trees and grass are being replaced by impervious surfaces of roads, roofs, and parking lots. This type of development reduces the infiltration of rainwater, thus increasing the amount of storm water runoff and the potential for flash flooding.



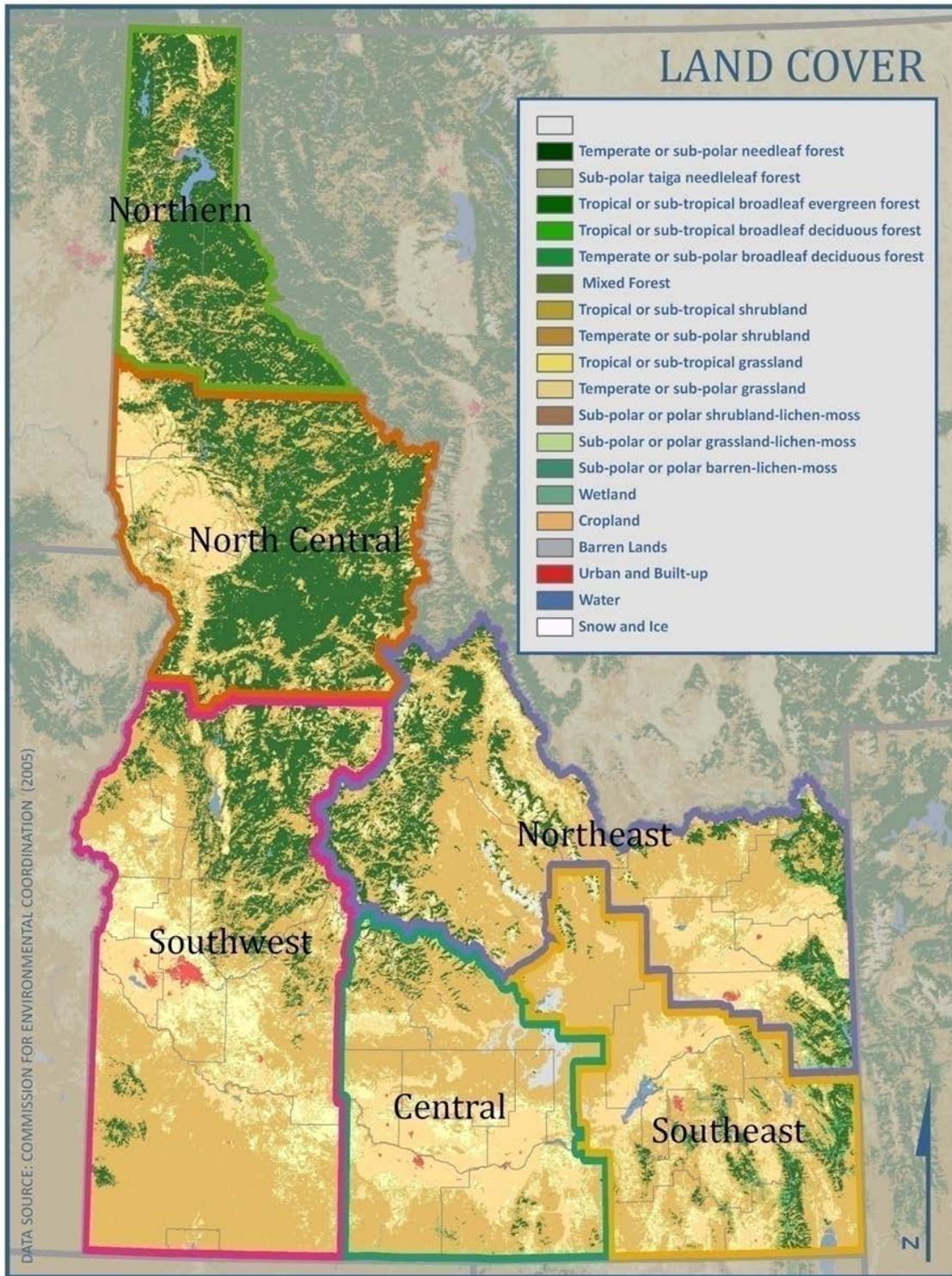
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Map 2.H: Idaho Land Ownership (Source: Idaho Department of Lands)



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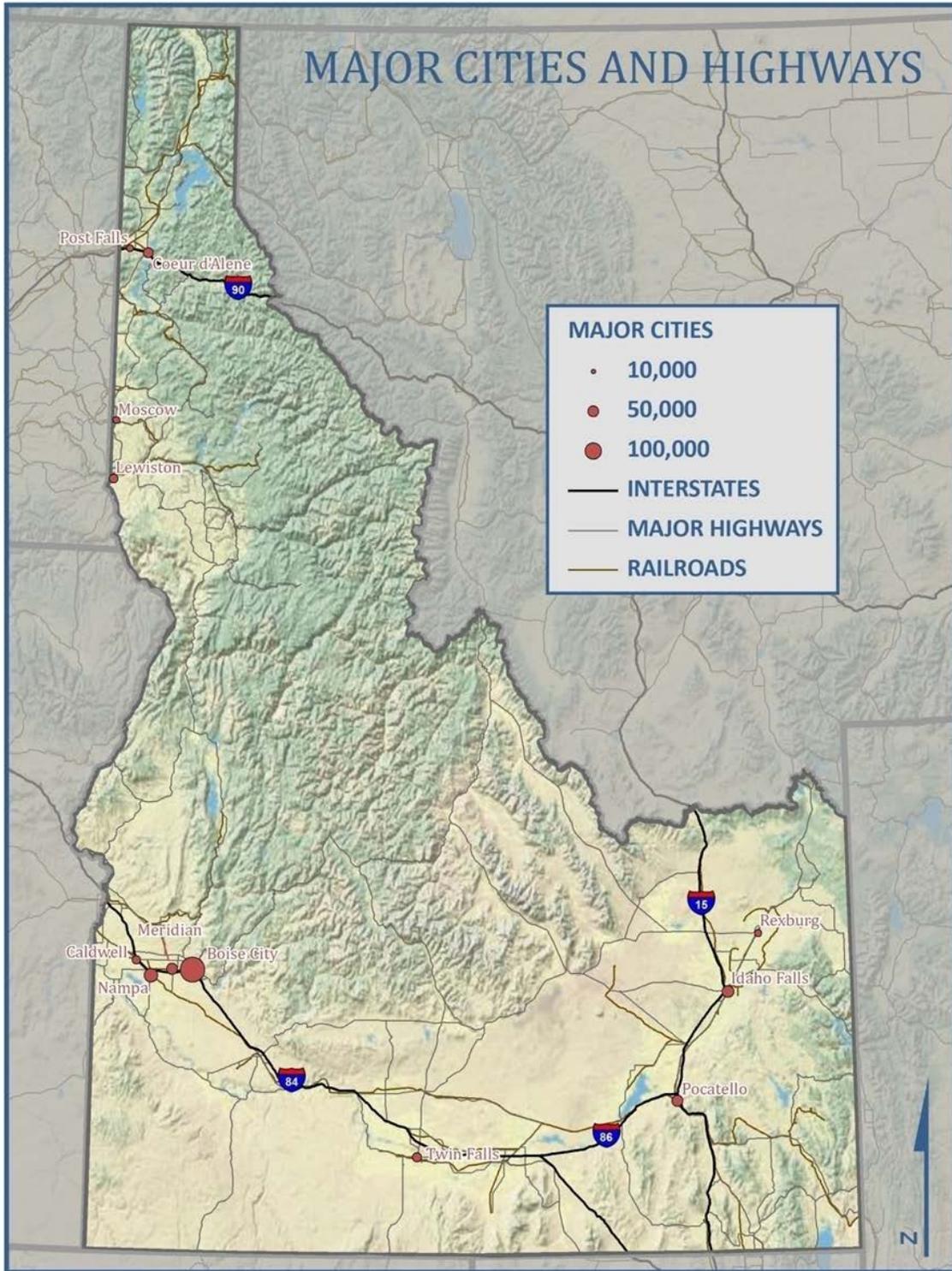


Map 2.1: Idaho Land Cover



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Land use and development in Idaho are largely dictated by the State's transportation infrastructure. Roads, rail lines and airports are critically important for the movement of people and the provision of goods and services. As a result, development typically occurs around transportation lines. Idaho has a widespread highway network of over 60,000 miles, which includes interstate highways such as Interstates 84, 86, 15, and 90 (See Map 2.J below). Idaho's transportation system also includes about 4,000 bridges, 1,887 miles of rail lines, 68 county and city airports, 38 recreational and emergency airstrips, 14 public transportation providers, and one seaport, the Port of Lewiston (Idaho Department of Transportation (DOT)). The State of Idaho is responsible for nearly 5,000 miles of highway, just 10 percent of all roadway miles in the State. However, according to the Idaho DOT, the State highway system accounts for 54 percent of the State's vehicle miles of travel. More discussion of development trends can be found throughout each hazard profile in Chapter 3.



Map 2.J: Major Roadways and Cities



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Over time, growing urban populations across the state have been using rural resources for multiple purposes other than those that have sustained Idaho’s rural economy in the past. In both the 1970’s and 1990’s, Idaho was among the seven fastest growing states in the nation. Conflicting demands to use or conserve land, water and wildlife dominate regional policy debates. Many people living in rural areas are developing innovative ways to capture economic benefits from recreation, wilderness, and tourism.

As shown in Table 2.K below, in 2011 the average wage in Idaho was \$35, 624. This is an increase of only \$719 from 2010. The largest increase in wages was felt in the information sector at 4.2 percent (or more than \$1,700). The smallest increase was felt in leisure and hospitality sector, up only 0.3 percent (or \$40). Mining continued to have the highest wage at \$68,198. No sectors reported a decrease in average wages. Leisure and hospitality continued to have the lowest average wage at \$13,846.

Table 2.K. Employment and Wage Trends (2001-2011) ²						
Covered Employment & Average Annual Wages Per Job for 2001, 2010 & 2011	2001		2010		2011	
	Average Employment	Average Wages	Average Employment	Average Wages	Average Employment	Average Wages
Total Covered Wages	571,323	\$27,769	605,561	\$34,905	607,591	\$35,624
Agriculture	19,841	\$20,737	21,588	\$27,725	21,910	\$29,062
Mining	1,968	\$38,858	2,290	\$66,779	2,575	\$68,198
Construction	37,851	\$31,057	31,317	\$38,153	29,526	\$38,463
Manufacturing	68,874	\$37,965	53,124	\$49,388	54,502	\$50,229
Trade, Utilities and Transportation	115,227	\$24,469	120,169	\$31,671	120,742	\$32,445
Information	9,586	\$32,977	9,673	\$41,117	9,408	\$42,863
Financial Activities	23,125	\$32,380	26,881	\$41,606	26,852	\$42,371
Professional and Business Services	67,682	\$33,995	74,114	\$42,524	74,679	\$43,757
Educational and Health Services	54,493	\$27,520	80,572	\$35,329	82,550	\$36,180
Leisure and Hospitality	53,052	\$10,561	57,879	\$13,806	59,019	\$13,846
Other Services	14,891	\$19,783	15,389	\$24,335	15,204	\$24,952
Government	104,733	\$29,062	112,664	\$36,191	110,626	\$36,611

During the Great Recession the Idaho tourism industry suffered a 17 percent decline in jobs while the rest of the state economy suffered losses around 8 percent on average. In 2011, Idaho’s tourism

² Idaho Department of Labor (July 2013)



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industry began to recover and has continued to grow ever since. The 2.6 percent job growth in tourism during 2012 outperformed the all-industry average of 2 percent growth.³

The associated influx of visitors to the state presents new emergency management challenges and planning concerns related to hazard vulnerability. Often, tourists are more vulnerable to disasters due to unfamiliarity with the area including evacuation routes and local communication outlets such as radio, television or newspaper. Additionally, high staff turnover in the service industry can reduce overall community preparedness for disasters.

CRITICAL INFRASTRUCTURE

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.

³ Idaho Department of Labor (May 2013)

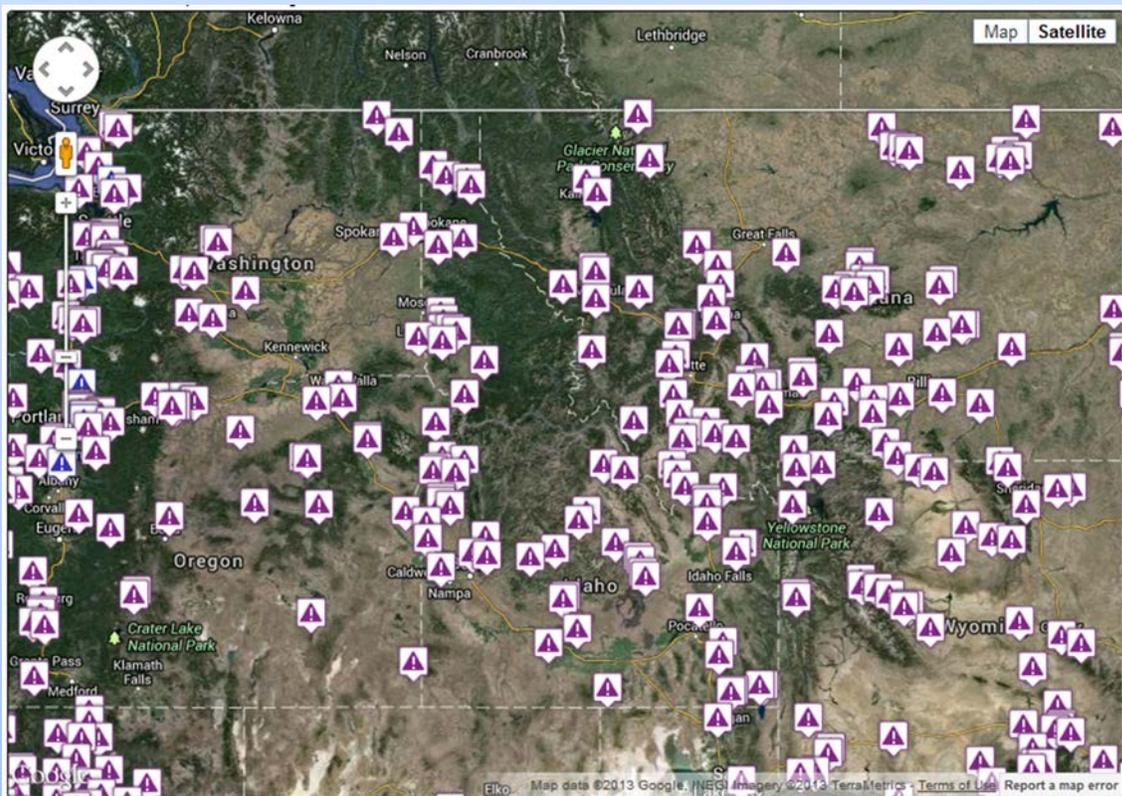


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Although advancement in the quality and availability of Geographic Information System (GIS) data has been positive in recent years, data limitations remain. Idaho currently uses the Homeland Security Infrastructure Protection (HSIP) Freedom Data for most risk assessment applications related to infrastructure. However this data still has limitations with identifying all critical facilities, types, and associated replacement values. Also is should be noted that the HSIP data is a collection of local, state, federal, and private infrastructure and facilities. At this point in time, it is not possible to specifically identify state-owned or operated infrastructure and facilities.

In August 2012, the Idaho Falls Post Register ran two articles concerning bridge safety. The articles pointed out the fact that much of our nation's infrastructure is aging and that the recent economic downturn has greatly slowed progress towards upgrading and replacing these structures. In addition, past bridge construction standards were quite different from those currently in place. The website [Save our Bridges](#) provides a map that identifies those bridges that have been deemed as structurally deficient and fracture critical bridges, by the Federal Highway Administration and state transportation agencies. A screenshot is provided below in Figure 2.L, that shows that a number of these bridges are located throughout the State.

Figure 2.L





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STATE FACILITIES

As part of the 2010 Plan update, one action that the State identified was the need to collect improved and up-to-date State-owned facility and infrastructure data in a geospatial format. As of the writing of the 2013 Plan update, this action is still considered in progress, although great strides have been made. The State Chief Information Officer (CIO) is currently working towards the realization of a State-owned facilities and infrastructure geodatabase. This remains a top priority of the Information Technology Resource Management Council's Geospatial Committee (Executive Order No. 2010-07 and §67-5745, Idaho Code). This on-going process has been slowed by recent budget shortfalls in addition to inconsistent data holdings across many of the State's Agencies. Once available, this database will enable for a more in-depth review of State-owned facilities and infrastructure, as it relates to both vulnerabilities to hazards and the associated loss estimations.

Although state-owned facility data was not available for use in this Plan update, local jurisdictionally-owned facility data was newly available in GIS format. This data, documented in Chapter 3, allowed for additional vulnerability and loss assessments on a statewide level for a number of hazards.



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