Contaminating Waters: Active Mining Districts and Sites in Idaho

GSP 270

5 December 2016

Figure 1. Depiction of a typical Dimension Stone quarry.

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Abstract

The state of Idaho has a rich mining history. Since the discovery of gold in Idaho, mining has been a major economic commodity for the state. Though there are few gold reserves left un-prospected. The mining of iron ore and rare earth metals, such as phosphorous and limestone, has ensured mineral extraction as the premier industry in Idaho. Unfortunately, mining has detrimental effects on the species and the environment, especially when mining is occurring near water sources. Though the agricultural industry and river recreationists are expected to adhere to strict environmental standards the mining industry is often able to bypass environmental regulations.

Not only leaving the tax payers to pay for the economic costs but the health costs as well. Currently over seventy prospects, occurrences, mines and quarries operate within the National Parks of Idaho. In consideration of these factors we performed a spatial analysis to determine the location of mining districts within national forest boundaries and mines proximate to major water resources.

Introduction

Given the issues arising from poor water quality in so many parts of the United States, such as the issues facing Flint Michigan, it is becoming increasingly clear to policy makers that the health of our water sources is linked to the health of the people. Agriculture Industries, and individuals who recreate in National Parks, near water sources are held to strict standards as not to contaminate or erode the areas near that water. Water quality standards for the extractive industries should be no exception. Primary industries such as resource extraction are generally understood to be more harmful to watersheds than a host of recreational activities combined. Despite being outdated, the Mining Rights Act of 1872 has made it easy for industries with preexisting claims to ignore the environmental costs of their operations (Department of the Interior). The Environmental Protection Agency and state regulatory commissions do their best to ensure the proper storage and maintenance of contaminates. However, it is often left to the people, not the industries, to pay for remediation.

In consideration of these factors we have performed several spatial analyses to determine the location of mines which may currently be operating within two miles of a major water source in National Forest boundaries. We also performed a spatial analysis on the locations of Mining Districts and mines currently in operation within National parks; though not necessarily within two miles of a water source. The results of our analyses are discussed in the following report.

Methods

To perform the analysis, we collected state boundary, hydrology, national forests, mines and mining districts data. Most of these datasets were acquired through state and federal agencies. National Forest boundaries data was acquired from the United States Forest Service. Mining Districts data was collected from the Centers for Disease Control. Active mines and hydrology data was collected from the Idaho State GIS website.

After collecting the data we performed an accuracy assessment by checking coinciding metadata. For the coordinate system, we decided to use GCS_North America_1983 because most of the data we had collected had already been projected into that coordinate system. To avoid error and maintain accuracy we projected the remaining data into GCS_North America_1983 as well.
In ArcMap we connected our folder obtaining the datasets to ArcCatalog and aligned the data in the Table of contents. We also downloaded a terrain basemap from the ArGIS website.

Next we clipped the national parks shapefile, then the rivers shapefile to the Idaho State boundary layer. We then clipped Mining Districts and Mines shapefiles to the new national parks layer. Next created a buffer to locate all mines within two miles of a major water source in national forest boundaries. For the next step we selected, by location, all mines within two miles of major rivers. A spatial join of mines within two miles of major rivers was also performed. The join resulted with all mines located within two miles of a major river, within National Forest boundaries. From the new data, we were able to find which national forest had mining operations proximate to major rivers. To distinguish between the various national forests in Idaho we categorized the unique values by forest name. We also categorized Mining Districts by name and Mines by designation. We also manually added labels to rivers since names were not provided in the data table. Once we had finished manipulating the data we could turn data layers on and off to create the necessary maps. When all the maps had been completed we saved them and exported the files in jpeg form at 300 dpi.

Discussion & Results

Our analyses resulted in the production of five maps: The first two maps indicate the locations of National Forests in the state of Idaho (*figure*.1) and the Mining Districts within the respective national forests (*figure*. 2). The third map (*figure. 3*) depicts active mines within National Forests. The fourth map (*figure. 4*) depicts the location of Active sites within the Willow Creek-Caribou Mining District. The final map (*figure. 5*) depicts the Dimension Stone Mine operating in the Caribou-Targhee National forest 0.8 miles from the Snake River.

The Willow Creek-Caribou Mining Districts is a major extractor of phosphate, limestone and coal. With over seventy prospects, occurrences, mines and quarries occurring within Willow Creek-Caribou Mining District it was not shocking to find at least one mine actively operating within

such a close distance of the Snake River. The dimension stone mine depicted on the map is (*figure*. 5) called the *Fall Creek Travertine Mine* which quarries blocks of rock specific to size, texture and color.

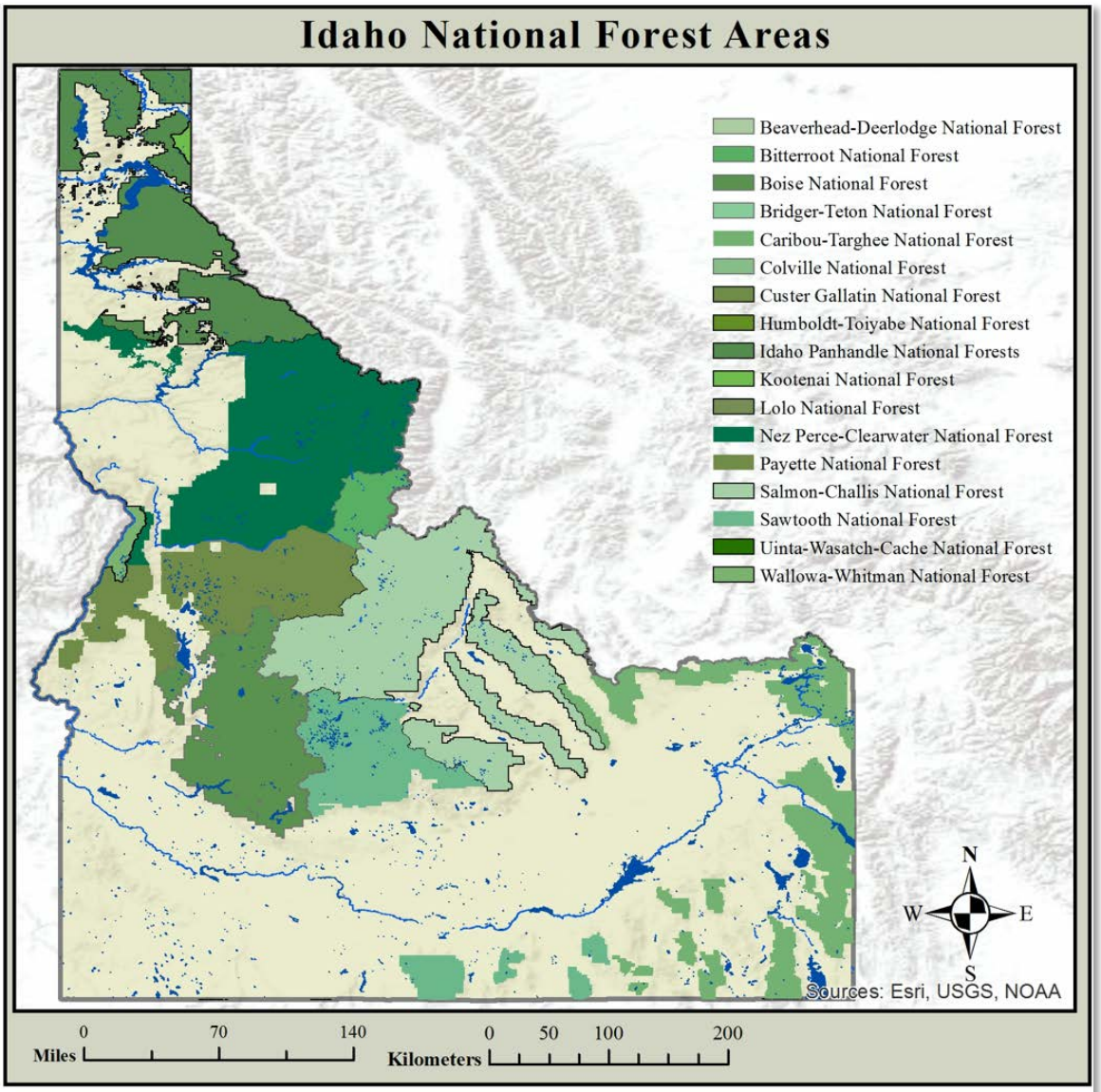

Figure 2. Depicts the locations and boundaries of all national forests within the state of Idaho.

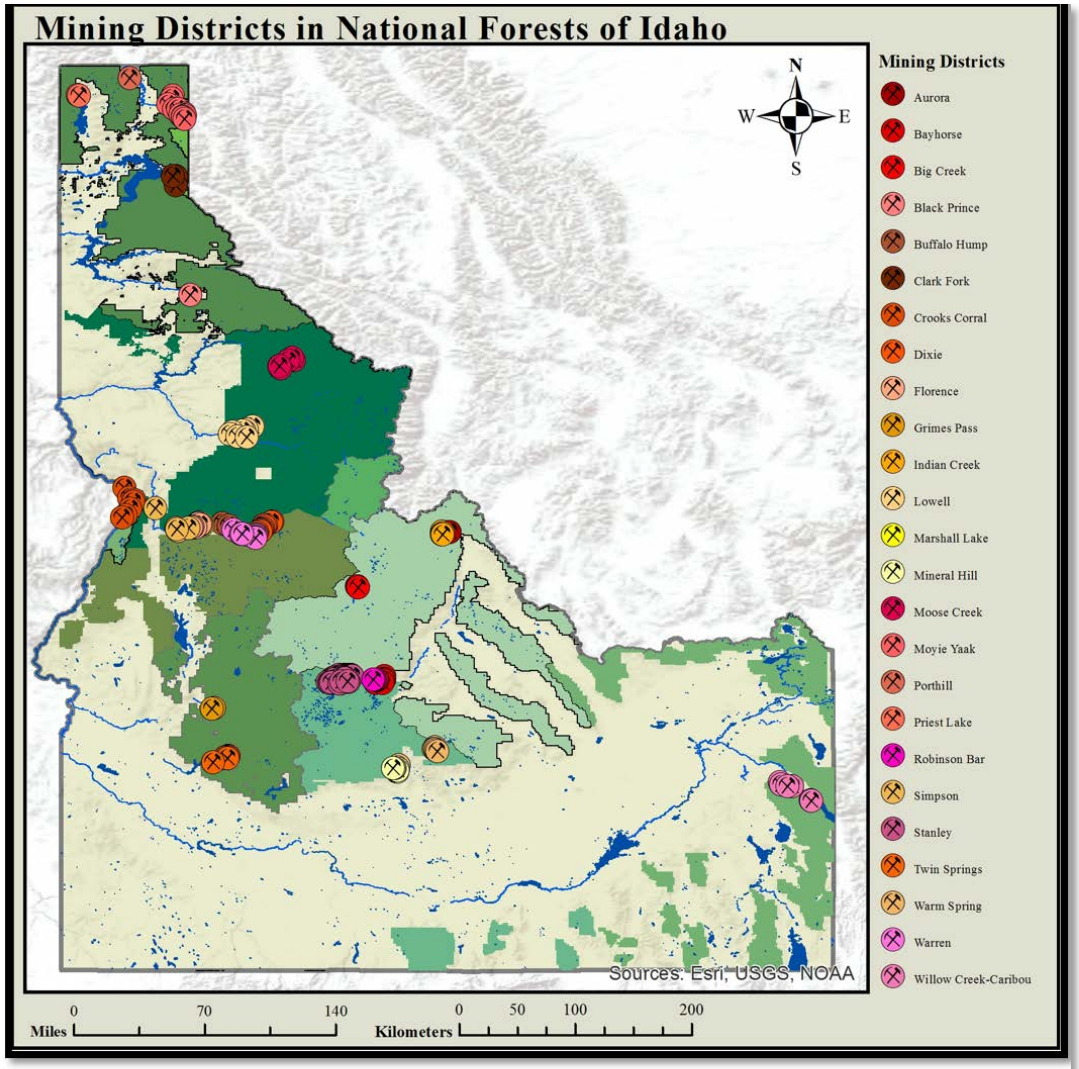

Figure 3. Depicts the 25 Mining Districts located within National Forest boundaries. Note that there are several sites within a single district.

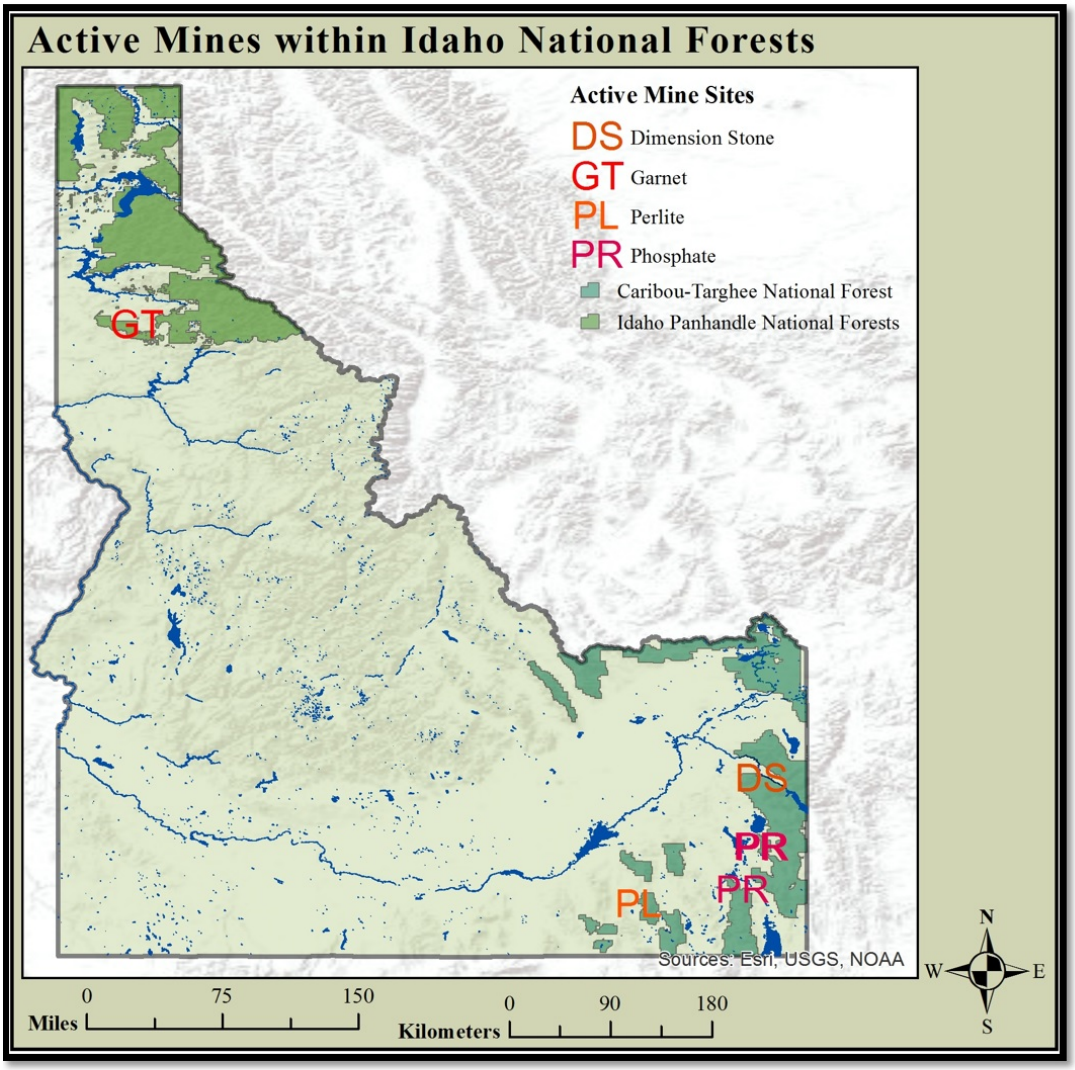

Figure 4. Depicts currently active mine and quarry sites operating within the authority of the National Forests.

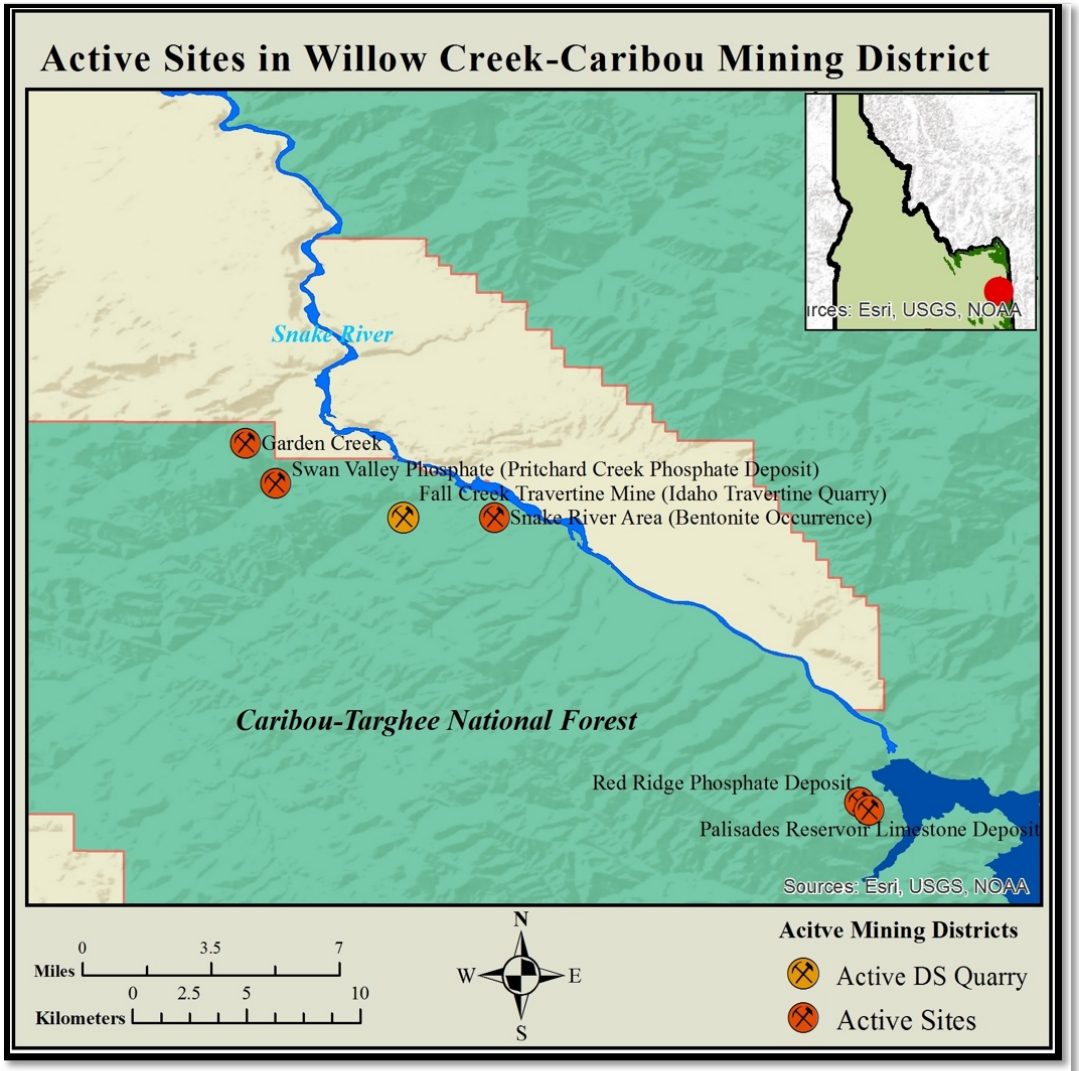

Figure 5. Depicts all the active sites within the Willow Creek-Caribou Mining District. As well as the Dimension Stone (Fall Creek Travertine Mine) quarry within 0.8 of a mile of the Snake River.

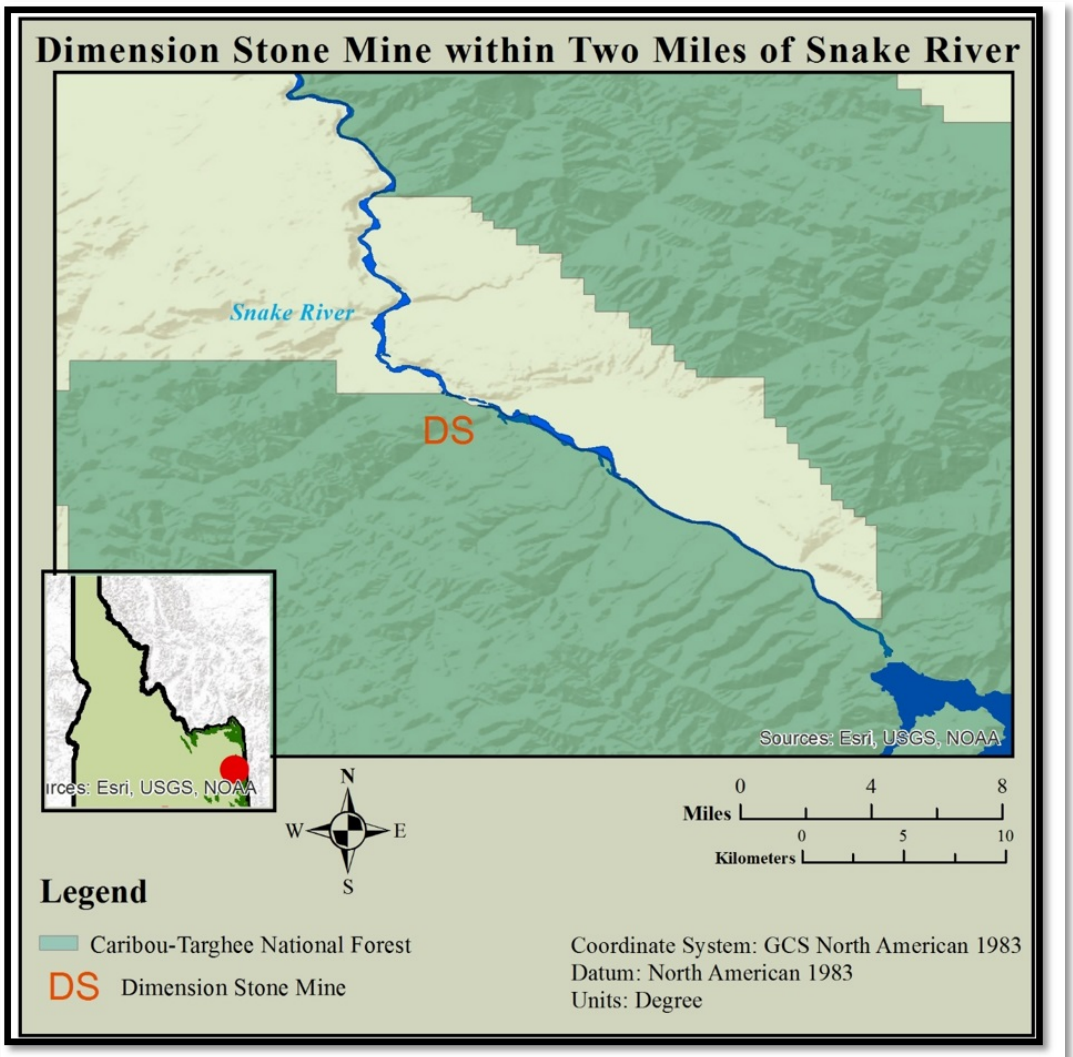

Figure 6. Depicts the location of the Dimension Stone quarry known as the Fall Creek Travertine Mine. Travertine is a type of limestone cut to specific dimensions, hence it's epithet "Dimension Stone". The quarry operates within two miles of the Snake River in the Willow Creek-Caribou Mining District.

Conclusion

There is a definite risk to the water quality given the proximity of the *Fall Creek Travertine Mine* to the Snake River. The Snake River and its watershed covers nearly 108,000 square miles and composes nearly half (41%) of the Columbia River Basin. Given its designation as the fourteenth longest river in the U.S. the health of the river is vital to the health of millions of people and species who live in the Pacific Northwest Region. "Agricultural runoff along the Snake River has severely hurt the ecology of the river throughout the 20th century. Runoff from fertilizer and other chemicals and pollutants washed into the river greatly increase the nutrient load, especially of phosphorus… and nitrogen" (Digital Atlas of Idaho). As indicated by (*figure*. 3) the Willow

Creek-Caribou Mining District is rich in Phosphate deposits. In 2007, the EPA issued regulations requiring fish hatcheries and agriculture industries along the Snake River to reduce their phosphorus discharge. However, these regulations did not apply to the mining industry and do nothing to address the issue of the phosphates leached into the Snake River from mining operations such as the *Fall Creek Travertine Mine*. Given the already increased levels of phosphorus in the Snake River it seems ostensibly hazardous to continue mining along the Snake River.

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