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# An Investigation Into the Natural Mineral Lick at Lick Creek

Toby Dunn

George Furniss (mentor)

BITTERROOT COLLEGE

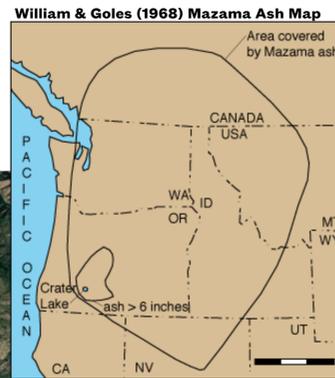
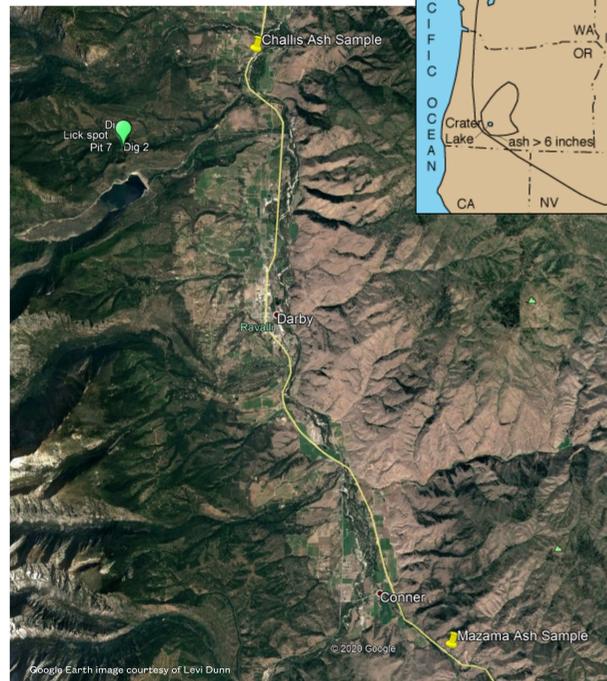
## Introduction-

This research seeks to understand more about the natural mineral lick at Lick Creek in the Bitterroot National Forest, where elk and deer continue to come year after year to “mine” the earth.

### Two main questions:

- ◆ What is the source of the minerals?
- ◆ What are the types and concentrations of the minerals?

## Sample Locations



## Lick Creek Mineral Lick



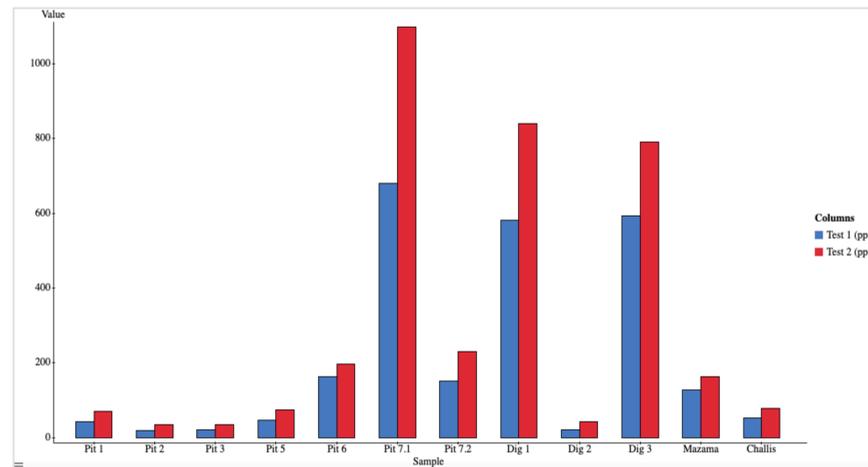
	below 100 ppm
	100 - 200 ppm
	700 - 900 ppm
	over 900 ppm

## Methods -

- ◆ 120 ml (1/2 cup) of distilled water per jar
- ◆ 30 ml (2 tbsp) of soil samples per jar
- ◆ TDS/EC meter used to measure dissolved solids of sample
- ◆ Test 1, 10 minutes after the initial mixing
- ◆ Test 2, 24 hours later

Note: the distilled water had a baseline TDS reading of 4 ppm.

## Results - Total Dissolved Solids Testing



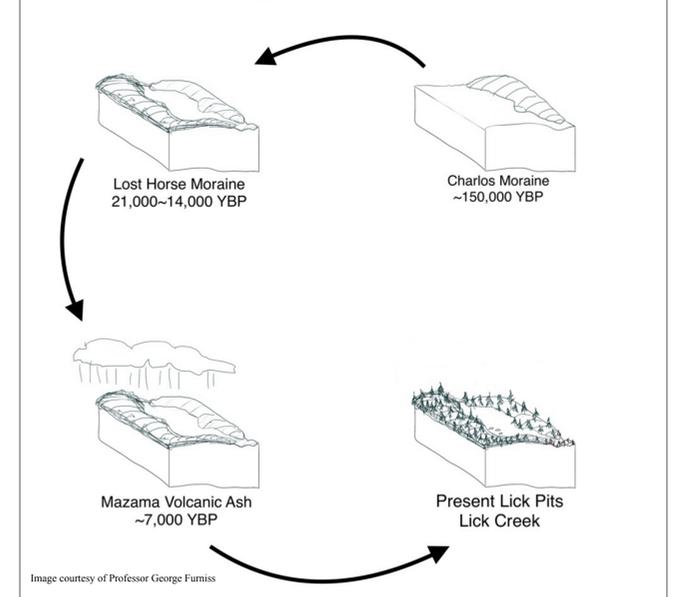
## Results - Mineral Composition of Samples

Unit = mg/L	Lick Pit 7	Mazama Ash	Challis Ash
Calcium (Ca)	174	49	5
Magnesium (Mg)	37	9	0
Sodium (Na)	370	55	43
Potassium (K)	4	0	2
Silicon (Si)	20.8	21.6	20.7
Iron (Fe)	0.12	0.02	0.85
Lithium (Li)	0.1	0	0
Strontium (Sr)	2.2	0.6	0
Aluminum (Al)	0	0	1.9
Copper (Cu)	0	0	0.01
Manganese (Mn)	0	0	0.01
Phosphorus (P)	0	0	0.2
Zinc (Zn)	0	0	0.02

## Results - Normalized Electrolyte Values

	Lick Pit 7	Mazama Ash	Challis Ash
Calcium (Ca)	30%	43%	10%
Magnesium (Mg)	6%	8%	0
Sodium (Na)	63%	49%	86%
Potassium (K)	1%	0	4%
Percent Total	100%	100%	100%

## Landform Progression of Lick Meadow



## Conclusion and Implications -

- ◆ Mazama volcanic ash is likely source
- ◆ Biologically necessary electrolytes (sodium, calcium, magnesium, potassium) present in samples

### Initial research questions answered and more:

- Types and concentrations of minerals present
- Source of minerals
- Highlights interconnectedness between geology and biology

### Recommendations for future actions:

- Requires more detailed sampling and analysis
- Compare to other mineral licks in the region and beyond

### Citations -

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Weber, W.M. (1972). Correlation of Pleistocene Glaciation in the Bitterroot Range, Montana with Fluctuations of Glacial Lake Missoula. Thesis (Ph.D), University of Washington.

Oregon State University.(2021). Distribution of ash from the eruption of Mount Mazama, Williams & Goles (1968). Volcano World: Crater Lake [Web page]. Retrieved from <http://volcano.oregonstate.edu/crater-lake>

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Mineral analysis by Energy Laboratories.