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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.

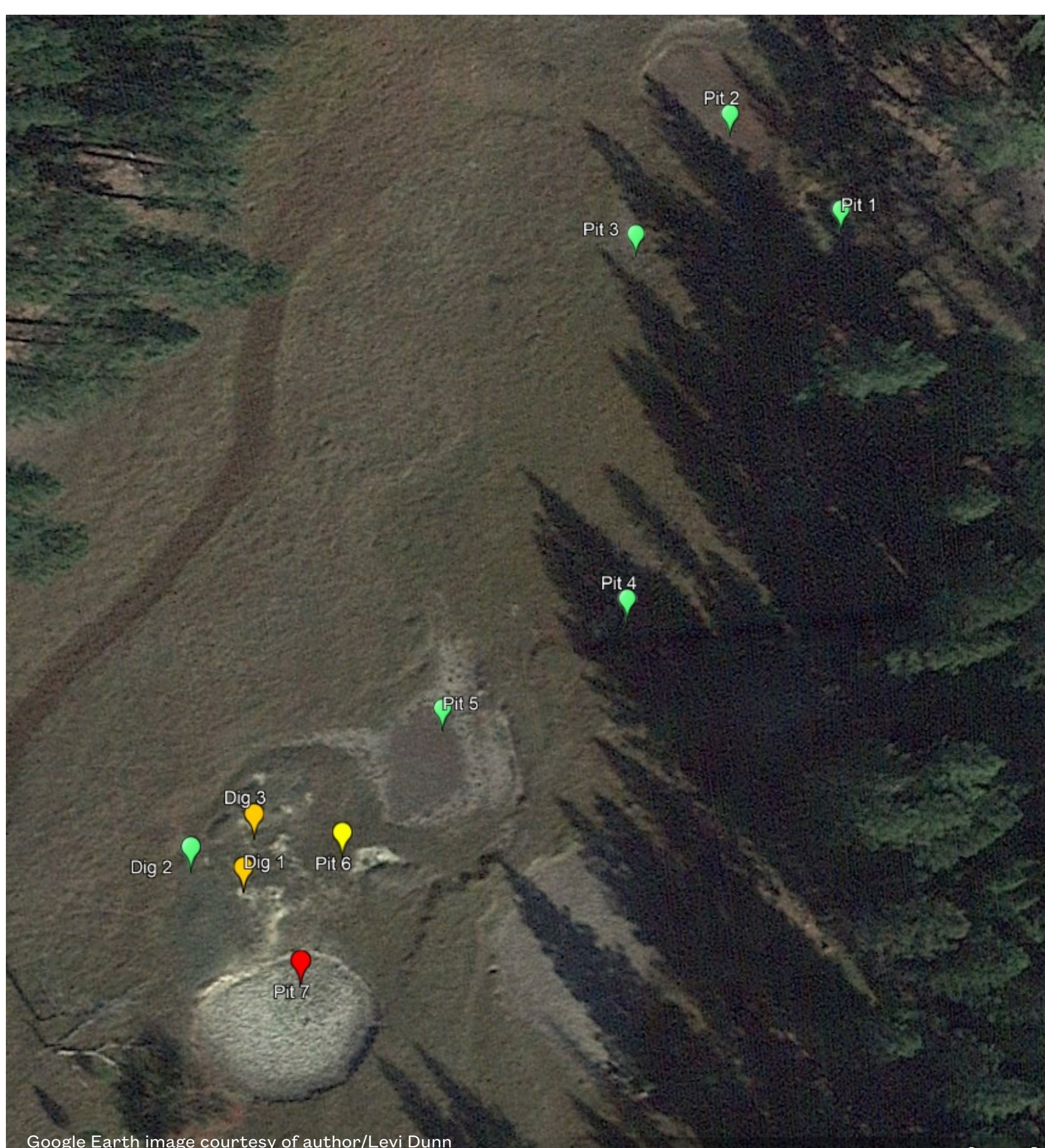
Two main questions:

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

Sample Locations



Lick Creek Mineral Lick



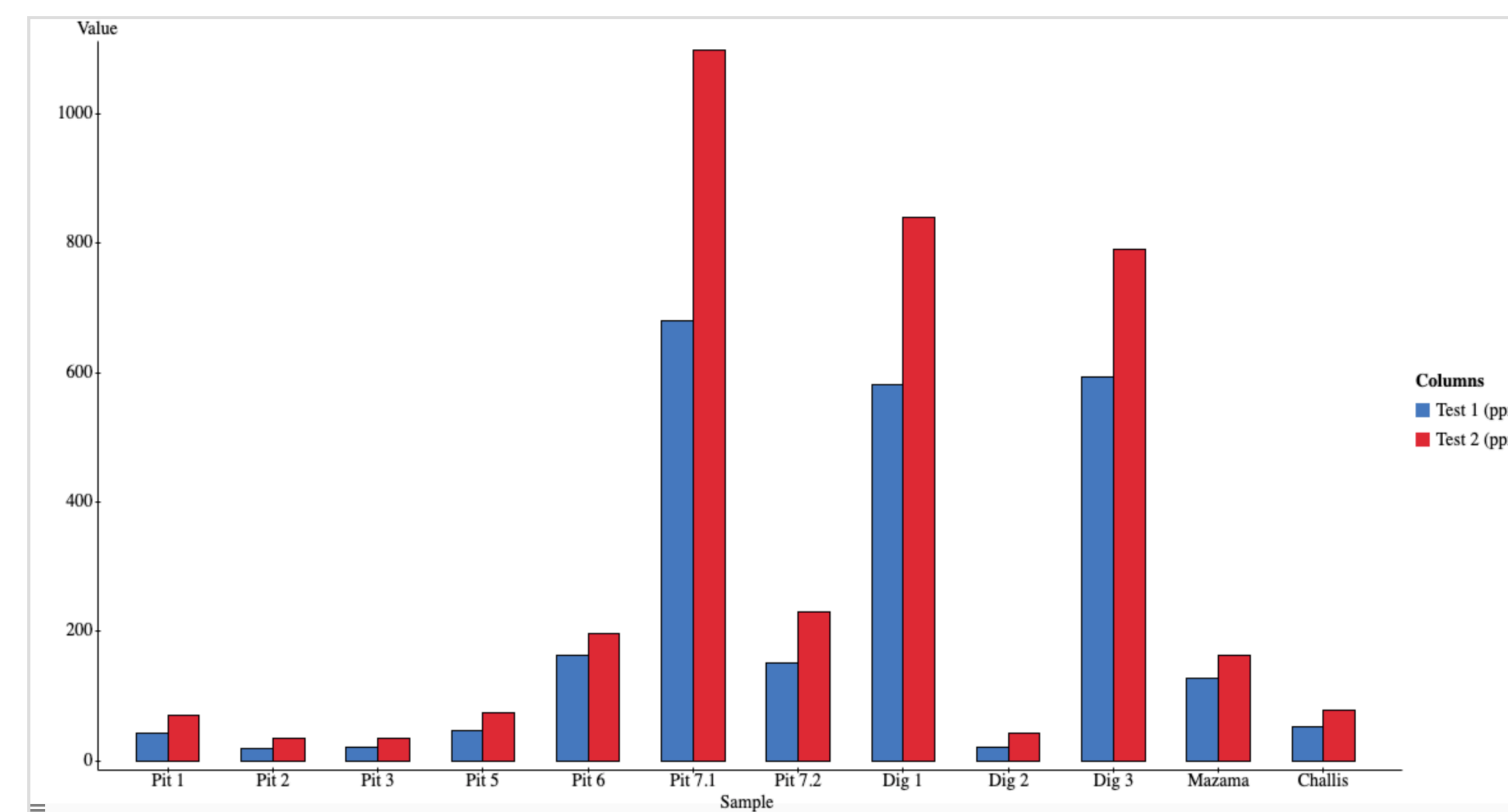
	below 100 ppm
	100 - 200 ppm
	700 - 900 ppm
	over 900 ppm

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



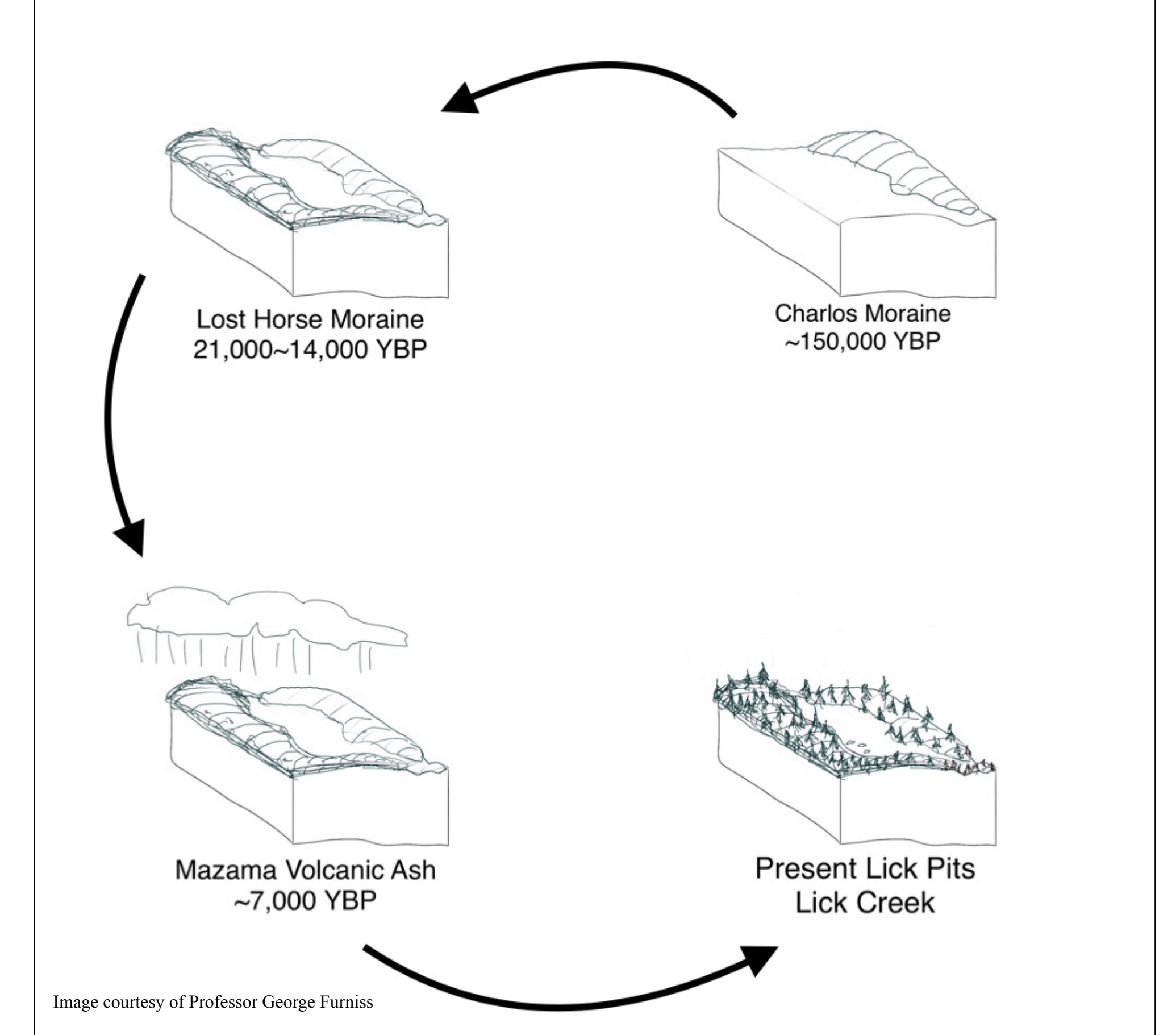
Results - Mineral Composition of Samples

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 -

Lonn, J.D., & Sears, J.W. (2001). Surficial Geologic Map of the Bitterroot Valley, Montana. Open File MBMG 441a. Scale 1:100,000.

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Acknowledgments -

Thank you to my mentor Professor George Furniss for engaging me in this experimentation and learning process and for all the interesting information he has imparted to me.

Thank you to my husband, Levi Dunn for letting me borrow his GPS and teaching me how to use it, and for assisting in preparing the Google Earth images.

A special thank you to the Patti Furniss Educational Memorial Fund for financial support on this project.

Mineral analysis by Energy Laboratories.