

Vegetation Community Mapping Between Different Lava Flows

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Resource Management

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Lava Flows

There are many different types of lava flows in the El Malpais. I conducted a community map of the vegetation of some of these lava flows.

Transitional Zone Between McCarty's and Hoya flows

From the trail head of the Acoma-Zuni I walked out study the vegetation community. This area is the Laguna flow also called Hoya flow and, this is some of the oldest lava flow out in the park. The vegetation Community of this area is, Pinyon Pine /juniper woodland Community with a grass understory. The dominant tree species is pinyon pine and the sub-dominant tree species is Juniper. The Grass understory is made up of different types of grasses and the main one is blue grama. You have many different plant species in this community such as cactus, scrub oak, vervain, rabbit brush and sage brush. When you reach the edge of the Hoya flow and the beginning of the McCarty's flow the vegetation begins to change and ponderosa pines start to show up and this area between the two flows is a transition zone. Still present in this zone are cactus, rabbit brush and grasses as well as scrub oak, junipers and pinyon pines. The McCarty's flow is characterized by ponderosa pine, pinyon pine, juniper species and shrubs scattered over the surface of the flow and the trees tend to be stunted.

Transitional Zone Between La Tetra Basalt and Candelaria Basalt Flow

In the higher elevations of this area it is a Ponderosa Pine community with a grass understory. In this community it is typified by mixed conifers but the areas covered by trees are thicker and larger than the small meadows interspersed between tree patches, with the dominant grass being blue grama. The sub-dominant tree being pinyon pines and rocky mountain juniper. In the lower elevation of this area the community is pinyon/juniper woodland. This area is dominant with pinyon pine and junipers, you also have gambles' oak and ponderosa pines present, with a grass understory and the dominant grass is blue grama. The vegetation in these two zones is defined, by the elevation not the lava flows as previously stated in higher elevation it's a ponderosa pine community and at lower elevation of these flows it's a pinyon/juniper woodland. Between the these two flows is where the transition from a ponderosa pine community to pinyon/juniper woodland begins to take place.

Transitional Zone Between La Tetra Basalt and Twin Craters Basalt Flows

Ponderosa pine community with a grass understory. The dominant tree is ponderosa pine and the sub-dominant tree is pinyon pine. The grass understory dominant species is blue grama, with slender wheat and bottle brush grass the sub-dominant. Also, mixed in this community you have patches of aspen grooves with Douglas firs mixed in. Even though there are two different types of lava flows here there is no transitional zone between them, when you pass between the La Tetra Basalt and Twin Craters Basalt flows you see that the lava changes but the vegetation stays the same, it's a ponderosa pine community. This is caused by elevation being roughly the same throughout these two flows.

Vegetation Zone Between Twin Craters and Lost Women Basalt Flows

Lost Women Basalt Flow is a Ponderosa parkland community with a grass understory. The dominant tree species is ponderosa pine with pinyon pine and rocky mountain juniper mixed in. The grass understory dominant species is blue grama with slender wheat and side oats and black grama present. This community is typified by large mature ponderosa pines standing widely separated in grassy meadows. In this community also present are areas of aspens with Douglas fir present. Where Twin Craters and Lost Women basalt flows meet you have a ponderosa pine community. The dominant tree being the ponderosa pine and the sub-dominant species being rocky mountain juniper and pinyon pine, with a grass understory and the dominant species being blue grama. The only difference you can really tell between these two flows is that in the Twin Craters area the ponderosa pines are thicker and mixed with juniper and pinyons and the grass meadows are smaller. The ponderosa pines in the Lost Women flow are typified by large mature trees standing widely separated in grassy meadows.

Lost Women Basalt Flow

This is a ponderosa parkland community with a grass understory. This area is typified by large mature ponderosa pines standing widely separated in grassy meadows. Also, present in this community are areas of aspens with Douglas firs present. The dominant tree species is ponderosa pine. The dominant grass species is blue grama.

Vegetation at Big Tubes Part of Bandera Flow Area

This area is a mixed conifer community with the dominant tree species being the ponderosa pine and the sub-dominant being the pinyon pine. The grass understory is dominated by blue grama grass. This area is typified by trees that are thicker and larger than the small meadows interspersed between tree patches.

Navajo Ice Cave Flow between two: Hoya and Younger Flows

The community in this area is Ponderosa pine community with a grass understory. The dominant tree is ponderosa pine with the pinyon pine as the sub-dominant tree. The grass understory is dominated by blue grama. Also present in this community is a grass/shrub community and it is characterized by blue grama in a sod habitat interspersed with forbs, mixed grasses, and shrubs. This area also needs to be remapped. This is because the geologist said when we were out in this area of the park that the geological map was wrong that the flow in this area is older than previously thought.

Forbes and Brush Species Found in Lava Flows

Some of the different types of forbes and brush that can be found in the park are banana yucca, apache-plume, mountain mahogany, skunkbush, salt cedar, greasewood, rubber rabbitbrush, wild onion, indian paintbrush, snakeweed, wild asters, red rocket, morning glory species, miner's candle, thistle, sunflowers, globemallow species, sage species, currant species as well as many other types of forbes and brush. These plants can be found in the different flows of the park some of these plant are found only in the McCarty's flow and some are found only in the Hoya flows. Also these plants are found all throughout the park from lower elevation to higher elevation as well as from the youngest flow to the oldest flow.

Conclusions

This study was undertaken to see if there are different communities between different types of lava flow. As previously stated in this report there are some differences between some of the flows and these differences show up quite well, like between the McCarty's flow and the Hoya flow. But on the other hand like between the Twin Craters Basalt flow and the Lost Women Basalt flow there is hardly and different between the two flows both are dominant by ponderosa pines and grass understory of blue grama and both have areas of aspens with Douglas fir present.

Also, because of the lava flows you also have micro-communities present in all of these communities between the lava flows such as; moss communities with lichen and ferns, liverwort and green algae present. Also found inside these communities are deciduous trees, which are characterized by stands of oaks, and groves of aspens with Douglas firs present inside and around some of the aspen groves.

The successional state for each flow will change over a period of time as the lava breaks down. These changes will take place over many years, such as the area of the McCarty's flow is the youngest flow this is where the most change will occur. These changes will be in plant life as well as animal life as different plants establish themselves this will allow different types of animals to increase their habitat. Where as in the Hoya flow that is the oldest flow in the park this is where the changes will be slower and harder to notice plant life as well as animal life expanding in these areas of the park.

Future Community mapping of rest of flows

I. List of flows reaming for next year

Some of the flows that have not been mapped are.
Between McCarty's and Bandera Crater.
Between Bandera Crater and Twin Craters.
Between Twin Craters and El Calderon.
Between El Calderon and the outside boundary of the park.

2. Mapping and Identifying Micro-Communities

Mapping and Identify Micro-Communities.
Moss beds, characterized by different types of mosses, green algae, liverwort and ferns, which are found at the entrances of caves and trenches thru out the park.
Aspens characterized by growing along flow edges and lava tubes collapse and sink holes throughout park. These groves of aspens have Douglas fir growing within them at higher elevation.

Final Opinion of Overall Study

This is a three-year study of vegetation communities between different lava flows and geological features thru out the El Malpais National Monument in conjunction with the National Park Service and U. S. Geological Survey. Next year the rest of the lava flows need to be mapped as well as the micro-

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communities. The only problem I foresee is that to really map all of the micro-communities within the park it would take two to three years to do it. I know this is not practical, as well as a waste of resources and time that could be spent on better projects.

This information can be used to tell how many different communities are present within the national monument. It can also be used for the big horn sheep reintroduction project coming up in the future. This information can tell the resource manager which area of the park is best suited for big horn sheep.