From Mauka to Makai

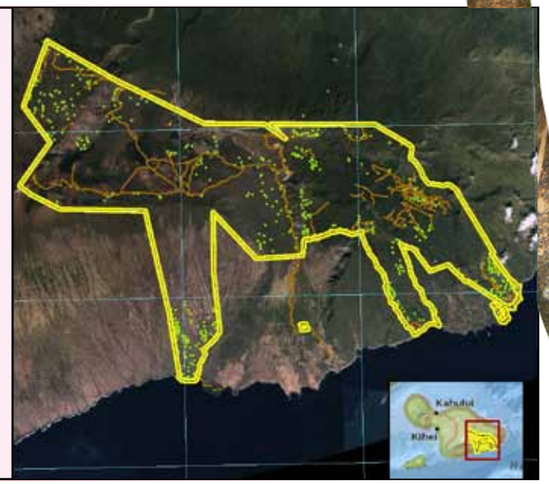
Vegetation Mapping at Haleakalā National Park

Field work for the Accuracy Assessment stage of Haleakalā National Park's vegetation mapping project commenced in January 2014. The purpose of Accuracy Assessment is to understand the strengths and weaknesses of the draft vegetation map (see below). This is done by on-the-ground assessment of the vegetation and referencing an established vegetation classification. The field data is then compared to the draft map to determine if the satellite imagery of the park's vegetation has been properly assigned into vegetation classification types. This process involves field crews navigating to randomly selected points throughout Haleakalā NP and assessing the site's vegetation within a 40 meter radius circle or designated polygon, and assigning a vegetation type that has been previously described at the park. The project included over 600 target points with over 50 possible vegetation types. These vegetation types occur at designated elevational and climatic zones and are classified by the dominant plant species present. At Haleakalā NP, these types range from the semi-natural lowland dry forest, dominated by the non-native kiawe tree (*Prosopis pallida*), to the montane wet forest dominated by the native ʻōhiʻa (*Metrosideros polymorpha*) and ʻōlapa trees (*Cheirodendron trigynum*). This project provided the opportunity for field crews to explore the amazingly diverse and unique landscapes of Haleakalā from mauka to makai, a Hawaiian phrase simply translated as 'from the mountain to the ocean'.

It is no small feat to map the vegetation of the 34,000+ acres that comprises Haleakalā NP. The process started over three years ago with the initial field classification plots and observations, and will be completed this spring when the final map and report are published. Once complete this comprehensive vegetation map will serve as a dynamic tool for park managers and research scientists. Accuracy Assessment is the final stage of the field work for the project and took no less than 15 Park staff, contractors, and volunteers to accomplish over a seven month period.

Lobelia gloria-montis

What is a vegetation map?
A vegetation map displays what type of plant communities exist in a specific area on Earth. Plant communities are named based on dominate (highest % cover) species, and defined by ecological factors (e.g. geology, elevation, precipitation, etc.). Together, these variables are used to develop a plant community classification. Using Geographic Information Systems (GIS) programming and remote sensing data (i.e satellite imagery), the classification can be applied across a larger landscape to develop a map of the various plant communities described within a specific area, such as Haleakalā National Park.



The field crew takes in the exquisite beauty of *Trematolobelia macrostachys*

"Crew members had to be ready to endure many physical challenges, but were often blessed with the spectacular scenery of Maui and the rare beauty of its flora and fauna."

–E. Urbanski

Haleakalā has some of the most diverse and unique environments in the world. Habitats include the mosaic Subalpine Shrubland, the sparse cindery Crater, the Greensword Bogs of the Northeast Rift, the ephemeral grasslands of Nuʻu, and the Wet Forests of Kīpahulu Valley and ʻOʻheo Gulch.

Six hundred and one points were observed with many requiring camping in remote backcountry areas of the park. Reaching points often involved traversing through dense vegetation, across varied terrain, and in inclement weather.

Manawainui is an area on the south side of Haleakalā positioned between Kaupō Gap on the west and Kīpahulu Valley on the east. It sits at 5,000 feet elevation above a spectacular valley that often displays numerous ribbons of waterfalls streaming down its cliffs, inspiring the name Manawainui which translates as 'powerful spirit water'. At the end of June, NPS Inventory and Monitoring crewmembers Meagan Selvig (University of Hawaiʻi cooperator), Joey Latsha (volunteer), and I had the opportunity to stay at ʻŌhiʻa Camp, a backcountry shelter in Manawainui, to assess the vegetation types and explore this unique area. Misty clouds gusted by us as we navigated to target points through mossy gulches, narrow ridges, and dense thickets of the vining fern uluhe (*Dicranopteris linearis*). We would call out to each other as we passed by a rarely seen plant or caught a glimpse of a native bird fluttering by. In one gulch we were delighted to see a population of over 20 *Lobelia gloria-montis*, a rare plant that is truly the glory of the mountain. Later as we proceeded to cross another gulch and head up a steep slope of uluhe, we happened upon a fully blooming *Trematolobelia macrostachys* with its branching inflorescence of magenta flowers. A rare and wonderful sight we were fortunate to behold as one of the great highlights of our field season at Haleakalā National Park.

–Elizabeth Urbanski, NPS Biological technician
–Meagan Selvig, UH-Hilo Vegetation mapping coordinator