Background

Big-leaf huckleberry (Vaccinium membranaceum Doug. ex Torr., hereafter VAME) is found throughout mid-elevations in western North America. VAME fruit is a popular berry for both human and wildlife consumption and it has been and continues to be an important berry diet only when growing in meadows or early-seral forest stands created by fire, forest harvesting, or other disturbance (Minore 1972). Sustained by Fire

Rejuvenation Through Mechanical Thinning

Methodology

The area to be thinned was divided into three units of approximately equal size. An equivalent adjacent area was also divided into three units and a nearby mature forest stand was used as a reference stand. Within each unit, nine 1m² quadrats were used to measure VAME height, percent VAME canopy cover, percent overstory tree cover, and VAME fruiting using a fruiting index developed by Anzinger 2002. Measurements were taken before the units were thinned, immediately after the units were thinned, and one year following thinning.

Results and Discussion

Thinning in 2010 resulted in a greater than 70% reduction in overstory tree canopy cover in the thinned units (Riley 2010). Analysis of variance (two-way ANOVA using only thinned and unthinned data) indicated no significant difference between average fruiting in any of the study units. The thinning treatment has not yet made a significant difference in VAME fruiting (F1,8 = 3.75, P = 0.08). There has not been a significant change of VAME fruiting within the thinned or the unthinned units in the past year (F1,8 = 0.279, P = 0.61). Nor is there any evidence yet of differentiation between the thinned and unthinned units over time (interaction F1,8 = 0.031, P = 0.87). We anticipate that eventually VAME fruiting in the thinned units will increase, VAME fruiting in the unthinned units will decrease, and VAME fruiting in the mature forest will remain unchanged. Other studies suggest significant VAME response to tree removal may take several years (Minore 1972, Anzinger 2002).

Future Monitoring

Monitoring of the units will continue periodically into the future.

Rejuvenation Through Controlled Burning

Introduction

The use of fire to maintain huckleberry fields was a historically widespread and culturally important practice for Northwest Native American tribes (Anzinger 2002). After a century of fire suppression and reduction of productive berry fields through ecological succession, this practice is being considered as a management tool to rejuvenate VAME fields in the North Cascades. It is anticipated that it may take multiple years post-burn to record measurable differences in fruit production as a result of fire.

Objective

The objective of this study is to measure the effect of prescribed fire on VAME fruit production.

Methodology

Within each plot (treatment and control), the following measurements were collected on 22 VAME plants:
- Live VAME canopy dimensions of height, long axis, and short axis (pre- and post-fire) (Riley 2010).
- The difference between pre- and post-fire data will be an indicator of overground VAME biomass consumed in the fire (Martin 1979).
- Canopy density above ground surface using a spherical densiometer held at the base of each VAME plant (pre- and post-fire) (Riley 2010).
- Overstory canopy density using a spherical densiometer held at the top of each VAME plant (pre- and post-fire) (Riley 2010).
- VAME berry production (Anzinger 2002).

The following measurements are also recorded in the treatment plots:
- The amount of soil consumed by fire using duff spikes to provide a measure of fire severity at ground level (Davies 2010).
- The duff layer is used to assess fire severity as opposed to using a thermometer or other measurement tool because this method will provide additional information concerning what is consumed by the fire in terms of soil content including belowground huckleberry biomass, soil organic matter, and soil nutrients.
- The nitrogen content of the duff layer using a carbon-nitrogen analyzer.

Results and Discussion

The pre-fire measurements have been recorded and the prescribed burn is scheduled to occur this October weather and forest conditions permitting. Due to weather conditions, the probability of burning this season is low; if the burn is not to occur this year, a second year window would be considered.

Future Work & Monitoring

- The post-fire measurements will be taken immediately following the controlled burn as well as in future growing seasons to monitor VAME response; analyses of this data will occur after collection.
- Additionally, if weather conditions do not permit the controlled burn this season, an additional methodology will be added: VAME total percent coverage of both the control and treatments plots will be assessed pre- and post-fire to provide additional information. This additional measurement will allow for post-fire changes in VAME coverage to be measured and analyzed when determining effects of fire on VAME fruit production.