Title: Plant succession and biomass dynamics following logging and burning in Watersheds 1 and 3, Andrews Experimental Forest, 1962 to Present

Abstract:
Watersheds 1 and 3 in the HJ Andrews Experimental Forest have a long history of hydrologic, geomorphic, and ecological study. Long-term successional studies in the two watersheds are unprecedented in their scope and duration (1962 to present), spanning more than 50 years of post-logging measurements. To date, studies have focused on understory responses to logging and burning, early stand developmental processes (tree growth and mortality), and understory responses to canopy closure. Understory sampling was initiated in 1962, prior to harvest, and includes approximately 190, 2 x 2 m permanent understory plots. Measurements include estimates of ground-surface conditions and abundance (cover and biomass) of herbaceous, shrub, and tree species. Plots were sampled annually through 1972/1973, but less frequently thereafter (every 2-6 years). Studies of early stand development were initiated in 1979/1980 in conjunction with the understory plots. In each of approximately 190, 250 m$^2$ tree plots all conifer and hardwood stems greater or equal to 1.4 m tall are tagged, measured for diameter, and assessed for status (live or dead, including the cause of mortality). Both watersheds have experienced recent snow-related windthrow (2019, 2020) and parts of WS1 have burned in a low-severity wildfire (2020) adding complexity to early successional outcomes.

Keywords: Biomass (trees); Biomass (understory); Canopy closure; Canopy communities; Clearcut logging; Community composition; Community structure; Disturbance; Long-Term Ecological Research (LTER); Nutrients; Plant community ecology; Plant succession; Primary production; Slash burning; Slash broadcast burning;Succession; Trophic structure; Organic matter; Primary production; Communities; Community structure; Long-Term Ecological Research (LTER); Plant ecology; Canopy cover; Biomass; Community composition; Trophic structure; Succession; Primary production; Disturbance; Burning; Timber harvest; Clearcutting; Nutrients; Organic matter; Canopies; Plants; Trees; Understory vegetation;

Date data commenced: 1962-01-01
Date data terminated: 2019-07-16
Principal Investigator: Charles B. Halpern

List of Entities:
1. Watersheds 1 and 3 Succession Plots -- Plot descriptions: Vegetation and soil classifications with location, elevation, aspect and slope measurements
2. WS1 & 3 Succession Plots -- Cover, frequency, and biomass related data
3. WS1 & 3 Succession Plots -- Tagged trees: Diameter data
4. WS1 & 3 Succession Plots -- Tagged trees: Height data
5. WS1 & 3 Succession Plots -- Canopy closure
6. Reference trees for plot center re-location

Attribute List:

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
<th>Range</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>STCODE</td>
<td>N N</td>
<td>char(5)</td>
<td>enum</td>
<td></td>
</tr>
<tr>
<td>FORMAT</td>
<td>N N</td>
<td>numeric(2,0)</td>
<td>range</td>
<td>1.0000</td>
</tr>
<tr>
<td>PLOTID</td>
<td>Y Y</td>
<td>char(6)</td>
<td>place</td>
<td></td>
</tr>
<tr>
<td>WATERSHED</td>
<td>N N</td>
<td>char(4)</td>
<td>place</td>
<td></td>
</tr>
<tr>
<td>UNIT</td>
<td>N N</td>
<td>char(2)</td>
<td>enum</td>
<td>1.0000</td>
</tr>
<tr>
<td>TRANSECT</td>
<td>N N</td>
<td>char(1)</td>
<td>enum</td>
<td>1.0000</td>
</tr>
<tr>
<td>PLOT</td>
<td>N N</td>
<td>numeric(2,0)</td>
<td>range</td>
<td>1.0000</td>
</tr>
<tr>
<td>PLANT_COMMUN</td>
<td>N N</td>
<td>char(1)</td>
<td>enum</td>
<td></td>
</tr>
<tr>
<td>SOIL_TYPE</td>
<td>N N</td>
<td>char(1)</td>
<td>enum</td>
<td></td>
</tr>
<tr>
<td>Attribute</td>
<td>Type</td>
<td>Nullable</td>
<td>Value Range</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------</td>
<td>----------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>SOIL_DISTURB</td>
<td>Y/N</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELEVATION_GPS</td>
<td>Y/N</td>
<td>numeric(4,0)</td>
<td>479.0000 - 966.0000</td>
<td>number</td>
</tr>
<tr>
<td>ELEVATION_DEM10</td>
<td>Y/N</td>
<td>numeric(4,0)</td>
<td>475.0000 - 964.0000</td>
<td>m</td>
</tr>
<tr>
<td>ELEVATION_LIDAR</td>
<td>Y/N</td>
<td>numeric(4,0)</td>
<td>485.0000 - 961.0000</td>
<td>number</td>
</tr>
<tr>
<td>ASPECT</td>
<td>Y/N</td>
<td>char(2)</td>
<td>enum</td>
<td></td>
</tr>
<tr>
<td>ASPECT_FIELD</td>
<td>Y/N</td>
<td>numeric(3,0)</td>
<td>0.0000 - 360.0000</td>
<td>deg angle</td>
</tr>
<tr>
<td>ASPECT_DEM10</td>
<td>Y/N</td>
<td>numeric(3,0)</td>
<td>0.0000 - 360.0000</td>
<td>deg angle</td>
</tr>
<tr>
<td>SLOPE_FIELD</td>
<td>Y/N</td>
<td>numeric(3,0)</td>
<td>0.0000 - 90.0000</td>
<td>%</td>
</tr>
<tr>
<td>SLOPE_DEM10</td>
<td>Y/N</td>
<td>numeric(3,0)</td>
<td>9.0000 - 123.0000</td>
<td>%</td>
</tr>
<tr>
<td>GPS_TYPE</td>
<td>N/N</td>
<td>char(1)</td>
<td>enum</td>
<td></td>
</tr>
<tr>
<td>LATITUDE</td>
<td>Y/N</td>
<td>numeric(13,8)</td>
<td>44.1900 - 44.2200</td>
<td>deg lat-lon</td>
</tr>
<tr>
<td>LONGITUDE</td>
<td>Y/N</td>
<td>numeric(13,8)</td>
<td>-122.2600 - 122.2200</td>
<td>deg lat-lon</td>
</tr>
<tr>
<td>UTM_EASTING</td>
<td>Y/N</td>
<td>numeric(8,0)</td>
<td>559491.0000 - 561758.0000</td>
<td>number</td>
</tr>
<tr>
<td>UTM_NORTHING</td>
<td>Y/N</td>
<td>numeric(8,0)</td>
<td>4894081.0000 - 4896196.0000</td>
<td>number</td>
</tr>
</tbody>
</table>

### Attribute List: 2. WS1 & 3 Succession Plots -- Cover, frequency, and biomass related data

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Nullable</th>
<th>Value Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>STCODE</td>
<td>N/N</td>
<td>char(5)</td>
<td>enum</td>
</tr>
<tr>
<td>FORMAT</td>
<td>N/N</td>
<td>numeric(2,0)</td>
<td>2.0000 - 2.0000</td>
</tr>
<tr>
<td>YEAR</td>
<td>Y/N</td>
<td>numeric(4,0)</td>
<td>1962.0000 - 2017.0000</td>
</tr>
<tr>
<td>PLOTID</td>
<td>Y/N</td>
<td>char(6)</td>
<td>place</td>
</tr>
<tr>
<td>WATERSHED</td>
<td>N/N</td>
<td>char(4)</td>
<td>place</td>
</tr>
<tr>
<td>UNIT</td>
<td>N/N</td>
<td>char(2)</td>
<td>enum</td>
</tr>
<tr>
<td>TRANSECT</td>
<td>N/N</td>
<td>char(1)</td>
<td>enum</td>
</tr>
<tr>
<td>PLOT</td>
<td>N/N</td>
<td>numeric(2,0)</td>
<td>1.0000 - 27.0000</td>
</tr>
<tr>
<td>QUADRAT</td>
<td>Y/N</td>
<td>char(1)</td>
<td>enum</td>
</tr>
<tr>
<td>SPECIES</td>
<td>Y/N</td>
<td>char(6)</td>
<td>taxa</td>
</tr>
<tr>
<td>TYPE</td>
<td>N/N</td>
<td>char(2)</td>
<td>enum</td>
</tr>
<tr>
<td>COVER</td>
<td>N/Y</td>
<td>numeric(5,1)</td>
<td>0.0000 - 100.0000</td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>N/Y</td>
<td>numeric(1,0)</td>
<td>0.0000 - 9.0000</td>
</tr>
<tr>
<td>INDIV_COUNT</td>
<td>Y/N</td>
<td>numeric(3,0)</td>
<td>1.0000 - 137.0000</td>
</tr>
<tr>
<td>DBH</td>
<td>N/Y</td>
<td>numeric(5,1)</td>
<td>0.8000 - 53.2000</td>
</tr>
<tr>
<td>DBA</td>
<td>N/Y</td>
<td>numeric(5,1)</td>
<td>0.1000 - 120.0000</td>
</tr>
<tr>
<td>HEIGHT</td>
<td>N/Y</td>
<td>numeric(6,1)</td>
<td>1.0000 - 1900.0000</td>
</tr>
<tr>
<td>STEMS</td>
<td>N/Y</td>
<td>numeric(3,0)</td>
<td>1.0000 - 200.0000</td>
</tr>
</tbody>
</table>
### WS1 & 3 Succession Plots -- Tagged trees: Diameter data

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Options</th>
<th>Length</th>
<th>Width</th>
<th>Tag</th>
<th>OUTOFPLOT</th>
<th>SampleDate</th>
</tr>
</thead>
<tbody>
<tr>
<td>LENGTH</td>
<td>numeric</td>
<td>(5,1)</td>
<td>range 1.0000 to 220.0000 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WIDTH</td>
<td>numeric</td>
<td>(5,1)</td>
<td>range 0.8000 to 50.0000 cm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAG</td>
<td>numeric</td>
<td>(5,0)</td>
<td>range 6.0000 to 9984.0000 number</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OUTOFPLOT</td>
<td>char</td>
<td>(1)</td>
<td>enum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAMPLEDATE</td>
<td>datetime</td>
<td></td>
<td>range 9/25/1962 to 10/27/2017 YYYY-MM-DD</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Attribute List:

- **STCODE**: char(5) enum
- **FORMAT**: numeric(2,0) range 3.0000 to 3.0000 number
- **YEAR**: numeric(4,0) range 1979.0000 to 2019.0000 number
- **PLOTID**: char(6) place
- **WATERSHED**: char(4) place 1.0000 to 3.0000
- **UNIT**: char(2) enum 1.0000 to 3.0000
- **TRANSECT**: char(1) enum 1.0000 to 6.0000
- **PLOT**: numeric(2,0) range 1.0000 to 27.0000 number
- **QUARTER**: numeric(1,0) range 1.0000 to 4.0000 number
- **TAG**: numeric(5,0) range 1.0000 to 10000.0000 number
- **CLUMP**: numeric(5,0) range 2.0000 to 9988.0000 number
- **NEARTAG**: numeric(5,0) range 1.0000 to 10000.0000 number
- **OLDTAG**: numeric(5,0) range 1.0000 to 10000.0000 number
- **TREE_SPP**: char(5) taxa
- **CLPCLASS**: char(1) enum
- **STEMCOUNT**: numeric(3,0) range 0.0000 to 30.0000 number
- **BDIA**: numeric(5,1) range 0.2000 to 27.0000 cm
- **HDIA**: numeric(5,1) range 0.3000 to 140.0000 cm
- **VIGOR**: char(1) enum
- **STATUS**: char(1) enum
- **SAMPLEDATE**: datetime range 6/21/1979 to 1/6/2019 YYYY-MM-DD
- **COMMENTS**: varchar(200) freetext

### WS1 & 3 Succession Plots -- Tagged trees: Height data

#### Attribute List:

- **STCODE**: char(5) enum
- **FORMAT**: numeric(2,0) range 4.0000 to 4.0000 number
### Attribute List:

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>YEAR</td>
<td>Y N</td>
<td>numeric(4,0) range 1979.0000-1997.0000 number</td>
</tr>
<tr>
<td>PLOTID</td>
<td>Y Y</td>
<td>char(6)</td>
</tr>
<tr>
<td>WATERSHED</td>
<td>N N</td>
<td>char(4) place</td>
</tr>
<tr>
<td>UNIT</td>
<td>N N</td>
<td>char(2) enum</td>
</tr>
<tr>
<td>TRANSECT</td>
<td>N N</td>
<td>char(1) enum</td>
</tr>
<tr>
<td>PLOT</td>
<td>N N</td>
<td>numeric(2,0) range 1.0000-24.0000 number</td>
</tr>
<tr>
<td>QUARTER</td>
<td>Y Y</td>
<td>numeric(1,0) range 1.0000-4.0000 number</td>
</tr>
<tr>
<td>TAG</td>
<td>Y Y</td>
<td>numeric(5,0) range 4.0000-3110.0000 number</td>
</tr>
<tr>
<td>TREE_SPP</td>
<td>N N</td>
<td>char(5) taxa</td>
</tr>
<tr>
<td>BDIA</td>
<td>N Y</td>
<td>numeric(5,1) range 0.5000-27.0000 cm</td>
</tr>
<tr>
<td>HDIA</td>
<td>N Y</td>
<td>numeric(5,1) range 1.4000-17.5000 cm</td>
</tr>
<tr>
<td>TREE_HT</td>
<td>N N</td>
<td>numeric(5,1) range 1.2000-10.2000 m</td>
</tr>
<tr>
<td>LEADER</td>
<td>N Y</td>
<td>numeric(3,0) range 15.0000-110.0000 cm</td>
</tr>
<tr>
<td>COMMENTS</td>
<td>N Y</td>
<td>varchar(200) freetext</td>
</tr>
</tbody>
</table>

5. WS1 & 3 Succession Plots -- Canopy closure

### Attribute List:

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>STCODE</td>
<td>N N</td>
<td>char(5) enum</td>
</tr>
<tr>
<td>FORMAT</td>
<td>N N</td>
<td>numeric(2,0) range 5.0000-5.0000 number</td>
</tr>
<tr>
<td>YEAR</td>
<td>Y N</td>
<td>numeric(4,0) range 1990.0000-2017.0000 number</td>
</tr>
<tr>
<td>PLOTID</td>
<td>Y N</td>
<td>char(6)</td>
</tr>
<tr>
<td>WATERSHED</td>
<td>N N</td>
<td>char(4) place</td>
</tr>
<tr>
<td>UNIT</td>
<td>N N</td>
<td>char(2) enum</td>
</tr>
<tr>
<td>TRANSECT</td>
<td>N N</td>
<td>char(1) enum</td>
</tr>
<tr>
<td>PLOT</td>
<td>N N</td>
<td>numeric(2,0) range 1.0000-24.0000 number</td>
</tr>
<tr>
<td>COVNW</td>
<td>N Y</td>
<td>numeric(5,1) range 0.0000-100.0000 %</td>
</tr>
<tr>
<td>COVNE</td>
<td>N Y</td>
<td>numeric(5,1) range 0.0000-100.0000 %</td>
</tr>
<tr>
<td>COVSE</td>
<td>N Y</td>
<td>numeric(5,1) range 0.0000-100.0000 %</td>
</tr>
<tr>
<td>COVSW</td>
<td>N Y</td>
<td>numeric(5,1) range 0.0000-100.0000 %</td>
</tr>
<tr>
<td>LOCATION</td>
<td>N N</td>
<td>char(2) enum</td>
</tr>
<tr>
<td>CCONIF</td>
<td>N N</td>
<td>numeric(5,1) range 0.0000-100.0000 %</td>
</tr>
<tr>
<td>CHRDWOOD</td>
<td>N N</td>
<td>numeric(5,1) range 0.0000-100.0000 %</td>
</tr>
<tr>
<td>CSHRUB</td>
<td>N N</td>
<td>numeric(5,1) range 0.0000-100.0000 %</td>
</tr>
<tr>
<td>CTOTAL</td>
<td>N N</td>
<td>numeric(5,1) range 0.0000-100.0000 %</td>
</tr>
</tbody>
</table>
**Attribute List:**

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>STCODE</td>
<td>N N char(5) enum</td>
<td></td>
</tr>
<tr>
<td>FORMAT</td>
<td>N N numeric(2,0) range</td>
<td>6.0000 6.0000 number</td>
</tr>
<tr>
<td>YEAR</td>
<td>Y N numeric(4,0) range</td>
<td>2017.0000 2017.0000 number</td>
</tr>
<tr>
<td>PLOTID</td>
<td>Y N char(6) place</td>
<td></td>
</tr>
<tr>
<td>WATERSHED</td>
<td>N N char(4) place</td>
<td></td>
</tr>
<tr>
<td>UNIT</td>
<td>N N char(2) enum</td>
<td></td>
</tr>
<tr>
<td>TRANSECT</td>
<td>N N char(1) enum</td>
<td></td>
</tr>
<tr>
<td>PLOT</td>
<td>N N numeric(2,0) range</td>
<td>1.0000 27.0000 number</td>
</tr>
<tr>
<td>REF1_TAG</td>
<td>N Y numeric(5,0) range</td>
<td>1.0000 9978.0000 number</td>
</tr>
<tr>
<td>REF1_DIST</td>
<td>N Y numeric(5,2) range</td>
<td>0.0100 6.7500 m</td>
</tr>
<tr>
<td>REF1_AZ</td>
<td>N Y numeric(3,0) range</td>
<td>1.0000 362.0000 deg az</td>
</tr>
<tr>
<td>REF2_TAG</td>
<td>N Y numeric(5,0) range</td>
<td>1.0000 9985.0000 number</td>
</tr>
<tr>
<td>REF2_DIST</td>
<td>N Y numeric(5,2) range</td>
<td>0.0100 8.5000 m</td>
</tr>
<tr>
<td>REF2_AZ</td>
<td>N Y numeric(3,0) range</td>
<td>1.0000 364.0000 deg az</td>
</tr>
<tr>
<td>SAMPLEDATE</td>
<td>N N datetime range</td>
<td>6/27/2017 10/27/2017 12:00:00 AM 12:00:00 AM YYYY-MM-DD</td>
</tr>
<tr>
<td>COMMENTS</td>
<td>N Y varchar(200) freetext</td>
<td></td>
</tr>
</tbody>
</table>

Attributes Definitions:

**ASPECT**

General aspect of plot by 8 cardinal directions

**ASPECT_DEM10**

Aspect determined from 10 meter DEM at GPS plot coordinates

**ASPECT_FIELD**

Aspect as measured by true north-based azimuth (deg), measured in 2002

**BDIA**

Basal diameter
CANCLOS
  Relative canopy closure

CCONIF
  % canopy cover by conifers (> 2 m tall)

CHRDWOOD
  % canopy cover by hardwoods (> 2 m tall)

CLPCLASS
  Clump size class

CLUMP
  Clump number

COMMENTS
  Comments

COVER
  Cover (percent of plot) - this is either plant species, growth form or ground surface cover

COVNE
  Percent cover in ne quadrant

COVNW
  Percent cover in nw quadrant

COVSE
  Percent cover in se quadrant

COVSW
  Percent cover in sw quadrant

CSHRUB
  % canopy cover by shrubs (> 2 m tall)

CTOTAL
  Total canopy cover (> 2 m tall)

DBA
  Basal diameter - measured at base above any basal swell

DBH
  Diameter at breast height - measured directly above the nail

DIRECTN
  Direction relative to start of transect (as you look toward plot 1 on transect

ELEVATION_DEM10
  Elevation (m) determined from 10 meter DEM at GPS plot coordinates

ELEVATION_GPS
  Elevation as measured by a Trimble Asset Surveyor with TDC-1 data logger in the field or interpolated (See gps_type)
Elevation as determined from 1 meter LIDAR at GPS plot coordinates in NAD83

FORMAT
- Entity number

FREQUENCY
- Frequency of a single species occurrence (0 to 9) in nine 1.1 foot-square plots in one quarter of 6.6 square foot central plot - used from 1962 through 1977

GPS_TYPE
- Defines method of assigning location coordinates: measured in field with Trimble Asset Surveyor (M) or interpolated from measured plots (I)

HDIA
- Diameter at breast height

HEIGHT
- Plant height

INDIV_COUNT
- Unique consecutive number assigned to each species requiring biomass measurements to account for multiple occurrences within the plot, e.g., multiple stems (formerly lc= line count)

LATITUDE
- Degrees latitude as determined from the GPS plot coordinates using NAD83 datum

LEADER
- Length of the current leader

LENGTH
- Length

LOCATION
- Indicates where the truck mirror was placed in the plot

LONGITUDE
- Degrees longitude as determined from the GPS plot coordinates using NAD83 datum

NEARTAG
- Tag near the tree of interest

OLDTAG
- Previous tag different from the tag of current measurement year

OUTOFPLOT
- Indicates whether plant species is rooted outside of plot (Y=outside, N=inside) - use begins in 2002

PLANT_COMMUN
- Plant community code (Rothacher, Jack; Dyrness, C. T.; Fredriksen, Richard L. 1967.)

PLOT
- Plot number of 250 square meter plot

PLOTID
- Plot Id consisting of watershed, unit, transect, and plot number

QUADRAT
Quadrat number - the central, original and long-term cover measurement plot is quadrat 0 - satellite quadrats (1-4) were added to increase the sampling area within the 250 sq. m plot but were discontinued (WS01: 1980-1983, WS03: 1979-1987)

QUARTER
Quarter number in plot

REF1_AZ
Azimuth from reference tree 1 to plot center location

REF1_DIST
Distance from reference tree 1 to plot center location

REF1_TAG
Tag number for reference tree 1

REF2_AZ
Azimuth from reference tree 2 to plot center location

REF2_DIST
Distance from reference tree 2 to plot center location

REF2_TAG
Tag number for reference tree 2

SAMPLEDATE
Field measurement date

SLOPE_DEM10
Slope determined from 10 meter DEM at GPS plot coordinates

SLOPE_FIELD
Slope of plot as estimated in the field from plot center

SOIL_DISTURB
Soil disturbance code

SOIL_TYPE
Soil type code (Rothacher, Jack; Dyrness, C. T.; Fredriksen, Richard L. 1967. and Dyrness, C. T. 1969.)

SPECIES
Species code

SPECIES1
Species 1 code

SPECIES2
Species 2 code

SPECIES3
Species 3 code

SPECIES4
Species 4 code

SPECIES5
Species 5 code
STATUS
   The status of the tree
STCODE
   Study code
STEMCOUNT
   Count of stems within the clpclass 0 or 3
STEMS
   Number of stems
TAG
   Stem tag number - use begins in 1983 and all trees are tagged greater than 1.37 meters tall
TRANSECT
   Transect number
TREE_HT
   Height of the tree
TREE_SPP
   Tree species code
TYPE
   Cover type indicator - describes whether SPECIES is a plant species, genus or family, a growth form, or a ground surface type
UNIT
   Watershed / Cutting unit number
UTM_EASTING
   UTM Easting coordinate - Zone 10
UTM_NORTHING
   UTM Northing coordinate - Zone 10
VIGOR
   Vigor of the tree
WATERSHED
   Watershed number
WIDTH
   Width
YEAR
   Year of measurement

Enumerated Domains:
Enumerated Domain for Attribute: ASPECT
   NE   Northeast
   SW   Southwest
   NW   Northwest
S  South  
W  West  
E  East  
N  North  
SE  Southeast  
Unknown aspect  
PS  Plant species  
PF  Plant family  
PG  Plant genus  

Enumerated Domain for Attribute: PLANT_COMMUN  
7  Unclassified  
1  Corylus cornuta - Gaultheria shallon  
4  Acer circinatum - Berberis nervosa  
2  Rhododendron macrophyllum - Gaultheria shallon  
3  Acer circinatum - Gaultheria shallon  
6  Polystichum munitum  
5  Coptis laciniata  

Enumerated Domain for Attribute: SOIL_DISTURB  
1  Undisturbed  
2  Disturbed/unburned  
4  Severely (heavily) burned  
3  Lightly burned  

Enumerated Domain for Attribute: SOIL_TYPE  
8  Stony limberlost  
9  Talus  
3  Andesite colluvium  
1  Frissell  
7  Stony frissell  
2  Limberlost  
4  McKenzie River  
5  Budworm  
6  Slipout  

Enumerated Domain for Attribute: TRANSECT  
5  Transect 5 - 5th lowest elevation transect for locating plots across watershed/unit
4 Transect 4 - 4th lowest elevation transect for locating plots across watershed/unit
2 Transect 2 - 2nd lowest elevation transect for locating plots across watershed/unit
3 Transect 3 - 3rd lowest elevation transect for locating plots across watershed/unit
1 Transect 1 - lowest elevation transect for locating plots across watershed/unit
6 Transect 6 - highest elevation transect for locating plots across watershed/unit

Enumerated Domain for Attribute: UNIT
32 WS03 - Unit 2: USFS stand number 1000887, cutting unit L221, original unit 9D
33 WS03 - Unit 3: USFS stand number 1000941, cutting unit L222, original unit 9E
31 WS03 - Unit 1: USFS stand number 1000872, cutting unit L141, original unit 9C
11 WS01 - Unit 1: USFS stand number 1001009, cutting unit Watershed 1, original unit number not assigned

Enumerated Domain for Attribute: STCODE
TP073 Study Code TP073

Enumerated Domain for Attribute: GPS_TYPE
M Measured
I Interpolated

Enumerated Domain for Attribute: OUTOF PLOT
9 Outside of plot status not recorded
Y Plant rooted outside of measurement quadrat
N Plant rooted inside of measurement quadrat

Enumerated Domain for Attribute: TRANSECT
5 Transect 5 - 5th lowest elevation transect for locating plots across watershed/unit
4 Transect 4 - 4th lowest elevation transect for locating plots across watershed/unit
2 Transect 2 - 2nd lowest elevation transect for locating plots across watershed/unit
3 Transect 3 - 3rd lowest elevation transect for locating plots across watershed/unit
1 Transect 1 - lowest elevation transect for locating plots across watershed/unit
6 Transect 6 - highest elevation transect for locating plots across watershed/unit

Enumerated Domain for Attribute: UNIT
32 WS03 - Unit 2: USFS stand number 1000887, cutting unit L221, original unit 9D
33 WS03 - Unit 3: USFS stand number 1000941, cutting unit L222, original unit 9E
31 WS03 - Unit 1: USFS stand number 1000872, cutting unit L141, original unit 9C
11 WS01 - Unit 1: USFS stand number 1001009, cutting unit Watershed 1, original unit number not assigned

Enumerated Domain for Attribute: STCODE
TP073 Study Code TP073

Enumerated Domain for Attribute: QUADRAT
0 Central and long-term measurement plot (quadrat) for percent cover
Satellite quadrat 1 established in one corner of each plot
Satellite quadrat 2 established in one corner of each plot
Satellite quadrat 3 established in one corner of each plot
Satellite quadrat 4 established in one corner of each plot

Enumerated Domain for Attribute: TYPE
PC Plant cover
GF Growth form
GC Ground cover

Enumerated Domain for Attribute: CLPCLASS
B Measurements were taken at the base of the tree
0 Dbh = 0 to 2.9 cm (last recorded in 2001)
3 Dbh = 3.0 to 4.9 cm (last recorded in 2001)
H Measurements were taken at breast of height (1.37 meters above base)
M Place holder for where tags are missing; these need to be replaced

Enumerated Domain for Attribute: STATUS
7 All stem(s) have grown out of this size class
9 Missing
2 Ingrowth
6 Dead
1 Alive, present last time
0 Establishment year
8 Tree was not assessed during the measurement year (2019 mortality check)

Enumerated Domain for Attribute: TRANSECT
5 Transect 5 - 5th lowest elevation transect for locating plots across watershed/unit
4 Transect 4 - 4th lowest elevation transect for locating plots across watershed/unit
2 Transect 2 - 2nd lowest elevation transect for locating plots across watershed/unit
3 Transect 3 - 3rd lowest elevation transect for locating plots across watershed/unit
1 Transect 1 - lowest elevation transect for locating plots across watershed/unit
6 Transect 6 - highest elevation transect for locating plots across watershed/unit

Enumerated Domain for Attribute: UNIT
32 WS03 - Unit 2: USFS stand number 1000887, cutting unit L221, original unit 9D
33 WS03 - Unit 3: USFS stand number 1000941, cutting unit L222, original unit 9E
31 WS03 - Unit 1: USFS stand number 1000872, cutting unit L141, original unit 9C
11 WS01 - Unit 1: USFS stand number 1001009, cutting unit Watershed 1, original unit number not assigned
Enumerated Domain for Attribute: VIGOR
3 Very bad
1 Alive, present last time
2 Poor
M Vigor is not recorded for dead or missing trees
U Unknown vigor of a living tree - vigor is not recorded
N Vigor is not recorded for clumps (clpclass=0 or 3)

Enumerated Domain for Attribute: STCODE
TP073 Study Code TP073

Enumerated Domain for Attribute: TRANSECT
5 Transect 5 - 5th lowest elevation transect for locating plots across watershed/unit
4 Transect 4 - 4th lowest elevation transect for locating plots across watershed/unit
2 Transect 2 - 2nd lowest elevation transect for locating plots across watershed/unit
3 Transect 3 - 3rd lowest elevation transect for locating plots across watershed/unit
1 Transect 1 - lowest elevation transect for locating plots across watershed/unit
6 Transect 6 - highest elevation transect for locating plots across watershed/unit

Enumerated Domain for Attribute: UNIT
32 WS03 - Unit 2: USFS stand number 1000887, cutting unit L221, original unit 9D
33 WS03 - Unit 3: USFS stand number 1000941, cutting unit L222, original unit 9E
31 WS03 - Unit 1: USFS stand number 1000872, cutting unit L141, original unit 9C
11 WS01 - Unit 1: USFS stand number 1001009, cutting unit Watershed 1, original unit number not assigned

Enumerated Domain for Attribute: STCODE
TP073 Study Code TP073

Enumerated Domain for Attribute: CANCLOS
3 51 - 75% canopy closure
4 76 - 100% canopy closure
2 26 - 50% canopy closure
1 0 - 25% canopy closure
N Not measured

Enumerated Domain for Attribute: DIRECTN
L Left of transect (as you look up transect)
D Down transect (toward the last plot on transect)
R Right of transect (as you look up transect)
U Up transect (toward plot 1 on transect)
9 Not measured
Enumerated Domain for Attribute: LOCATION

NE  Mirror in northeast corner
NW  Mirror in northwest corner
SE  Mirror in southeast corner
R   Mirror at rebar
SW  Mirror in southwest corner
9   Not measured

Enumerated Domain for Attribute: TRANSECT

5   Transect 5 - 5th lowest elevation transect for locating plots across watershed/unit
4   Transect 4 - 4th lowest elevation transect for locating plots across watershed/unit
2   Transect 2 - 2nd lowest elevation transect for locating plots across watershed/unit
3   Transect 3 - 3rd lowest elevation transect for locating plots across watershed/unit
1   Transect 1 - lowest elevation transect for locating plots across watershed/unit
6   Transect 6 - highest elevation transect for locating plots across watershed/unit

Enumerated Domain for Attribute: UNIT

32  WS03 - Unit 2: USFS stand number 1000887, cutting unit L221, original unit 9D
33  WS03 - Unit 3: USFS stand number 1000941, cutting unit L222, original unit 9E
31  WS03 - Unit 1: USFS stand number 1000872, cutting unit L141, original unit 9C
11  WS01 - Unit 1: USFS stand number 1001009, cutting unit Watershed 1, original unit number not assigned

Enumerated Domain for Attribute: STCODE

TP073  Study Code TP073

Enumerated Domain for Attribute: TRANSECT

5   Transect 5 - 5th lowest elevation transect for locating plots across watershed/unit
4   Transect 4 - 4th lowest elevation transect for locating plots across watershed/unit
2   Transect 2 - 2nd lowest elevation transect for locating plots across watershed/unit
3   Transect 3 - 3rd lowest elevation transect for locating plots across watershed/unit
1   Transect 1 - lowest elevation transect for locating plots across watershed/unit
6   Transect 6 - highest elevation transect for locating plots across watershed/unit

Enumerated Domain for Attribute: UNIT

32  WS03 - Unit 2: USFS stand number 1000887, cutting unit L221, original unit 9D
33  WS03 - Unit 3: USFS stand number 1000941, cutting unit L222, original unit 9E
31  WS03 - Unit 1: USFS stand number 1000872, cutting unit L141, original unit 9C
11  WS01 - Unit 1: USFS stand number 1001009, cutting unit Watershed 1, original unit number not assigned

Enumerated Domain for Attribute: STCODE

TP073  Study Code TP073