

Data Set Citation

When using this data, please cite the data package

Tubbesing C , Stephens S , Battles J , and York R.  
**Post-fire shrub and juvenile conifer data, Sierra Nevada, CA USA 2015-2017**  
Tubbesing.4.4

General Information

Title:	Post-fire shrub and juvenile conifer data, Sierra Nevada, CA USA 2015-2017
Identifier:	Tubbesing.4.4
Abstract:	Our objective was to better understand long-term tree recovery in large high-severity fire patches. We measured juvenile conifer growth in relation to shrub competition in five fire footprints ranging from 8 to 35 years old and > 400 ha in size. To test whether reductions in conifer growth may lead to increased mortality, we also evaluated how recent tree growth predicts mortality of similarly aged juvenile trees in nearby managed stands.
Keywords:	<div><div></div><div><ul style="list-style-type: none"><li>Sierra Nevada</li><li>Tree mortality</li><li>Pinus ponderosa</li><li>Abies lowiana</li><li>High-severity fire</li><li>Montane chaparral</li></ul></div></div>

Data Table, Image, and Other Data Details:

Metadata download Ecological Metadata Language (EML) File

Data Table:

Name:

master\_seedlings\_vert.txt

Description:

Juvenile conifer data from fire footprints

Physical Structure Description:

Object Name:

master\_seedlings\_vert.txt

Size:

139188 byte

Text Format:

Number of Header Lines:

1

Record Delimiter:

#x0A

Attribute Orientation:

column

Simple Delimited:

Field Delimiter:

#x09

Number Of Records:

563

Online Distribution Info:

ecogrid://knb/Tubbesing.7.1

Attribute(s) Info:

Name	Column Label	Definition	Type of Value	Measurement Type	Measurement Domain	Missing Value Code	Accuracy Report	Accuracy Assessment	Coverage	Method
Sdlg	Seedling	Juvenile		nominal						

		conifer number (assigned)			Def Assigned identification numbers					
Species		Juvenile conifer species		nominal	<a href="#">Domain Info</a>					
Fire		Wildfire footprint name		nominal	<a href="#">Domain Info</a>					
FirePatch		Shrub patch identifier within wildfire footprint		nominal	<a href="#">Domain Info</a>					
Ht2017.cm.fall		Juvenile conifer height as measured in fall of 2017		ratio	Unit centimeter Type natural					
Elevation		Elevation		ratio	Unit meter Type natural					
Nearby_Easting		Closest easting as measured on GPS device		ratio	Unit meter Type natural					
Nearby_Northing		Closest Northing as measured on GPS device		ratio	Unit meter Type natural					
Slope.Deg		Slope		ratio	Unit degree Type natural					
Aspect.deg		Aspect		ratio	Unit degree Type natural					
BasDia2016.cm		Juvenile conifer basal diameter measured in 2016		ratio	Unit millimeter Type natural					
Datasheet1_2016		File name of original data sheet where these data were recorded		nominal	Def shrub patch and date					
Date1_2016		Date of first measurements in 2016		dateTime						
Date2_2016		Date of second measurement in 2016		dateTime		Code 9/9/9999 Expl No return measurements in 2016				
personel2		Field crew members performing measurements at second visit		nominal	<a href="#">Domain Info</a>	Code 0 Expl No second visit in 2016				
personel1		Field crew who performed the first measurements in 2016		nominal	<a href="#">Domain Info</a>					
ShrubSpp03		Dominant		nominal	<a href="#">Domain Info</a>					

		shrub species between 0 and 3 meters from focal tree								
Cov1.3		Sum of shrub cover along all 4 shrub transects, each 3 meters long beginning at the focal tree and running North, South, East, and West		ratio	<b>Unit</b> centimeter <b>Type</b> natural					
Ht1.3		Average shrub height along the 4 shrub transects		ratio	<b>Unit</b> centimeter <b>Type</b> natural					
Years		Years since fire		ratio	<b>Unit</b> nominalYear <b>Type</b> natural					
DataSheet2017		Name of data sheet where 2017 data was originally recorded		nominal	<b>Def</b> name often contains the fire code, date, and device where data was recorded					
BasDia2017.mm.1		Basal diameter measured in 2017 (first diameter of two)		ratio	<b>Unit</b> millimeter <b>Type</b> real					
BasDia2017.mm.2		Basal diameter measured in 2017 (second of 2 perpendicular diameter measurements)		ratio	<b>Unit</b> millimeter <b>Type</b> real					
siteclass		Site class of the land parcel as determined by map overlay		ordinal	<b>Def</b> Site classes 0-7					
Y		latitude		ratio	<b>Unit</b> degree <b>Type</b> natural					
X		longitude		ratio	<b>Unit</b> degree <b>Type</b> natural					
incidrad		Potential incident radiation		ratio	<b>Unit</b> dimensionless <b>Type</b> real					
heatload		Heat load		ratio	<b>Unit</b> number <b>Type</b> real					
Year		Year in which conifer growth measurement was taken		ordinal	<b>Def</b> Year					
VertGrowth_cm		Conifer growth increment in		ratio	<b>Unit</b> centimeter					



HEIGHT		Height of juvenile conifer		ratio	<b>Unit</b> centimeter <b>Type</b> real					
DEAD_ALIVE		Code for whether the tree was dead or alive when located		nominal	<b>Domain Info</b>					
BAS_DIA_1_mm		Basal diameter, first of two oerpendicular measurements		ratio	<b>Unit</b> millimeter <b>Type</b> real					
BAS_DIA_2_mm		Basal diameter, second of two perpendicular measurements		ratio	<b>Unit</b> millimeter <b>Type</b> real					
LAST_YR_GR_cm		Previous year vertical growth		ratio	<b>Unit</b> centimeter <b>Type</b> natural					
MINUS_1_GR_cm		Vertical growth in the second to most recent growing year		ratio	<b>Unit</b> centimeter <b>Type</b> real					
MINUS_2_GR_cm		Vertical growth in the third most recent year according to bud scars		ratio	<b>Unit</b> centimeter <b>Type</b> real					
PERC_NEEDLES		Percentage of needles remaining on dead tree		ordinal	<b>Def</b> estimate of %					
NEEDLE_COLOR		Needle color on dead trees		nominal	<b>Def</b> need color description					
BARK		Description of bark for helping to determine when the tree died		nominal	<b>Def</b> Description					
BUDS		Description of how intact buds are to help with determining when the tree died		nominal	<b>Def</b> Description of buds					
Growing?		Description of whether the tree was growing when it died		nominal	<b>Def</b> Description					
SUPPRESSED		Was the tree suppressed when it was found?		nominal	<b>Def</b> yes or no					
NOTES		Notes		nominal	<b>Def</b> Notes					
Cut_at_bottom		1 if dendro measurements are from a cross section taken at ground level as opposed to 10 cm from ground level		nominal	<b>Domain Info</b>					
DEAD		whether or not the tree was dead when it was found		nominal	<b>Domain Info</b>					
PAIR		Pair number		nominal	<b>Def</b> Pair number					
death_year		Year tree died, as determined by physical		ratio	<b>Unit</b> dimensionless <b>Type</b> natural					

characteristics and  
dendrochronological  
measurements

Data Table:

Name:

mort\_counts.csv

Description:

Survey results of live and dead juvenile tree densities at Blodgett Forest

Physical Structure Description:

Object Name:

mort\_counts.csv

Size:

29752 byte

Text Format:

Number of Header Lines:

1

Record Delimiter:

#x0A

Attribute Orientation:

column

Simple Delimited:

Field Delimiter:

,

Number Of Records:

1100

Online Distribution Info:

ecogrid://knb/Tubbesing.10.1

Attribute(s) Info:

Name	Column Label	Definition	Type of Value	Measurement Type	Measurement Domain	Missing Value Code	Accuracy Report	Accuracy Assessment	Coverage	Method
DATE		Survey date		dateTime						
POINT		Point ID		ratio	<div><div>Unit</div><div>number</div></div> <div><div>Type</div><div>natural</div></div>					
COMP	Compartment	Management unit at Blodgett Forest		nominal	<a href="#">Domain Info</a>					
count		the number of trees found within a 1 m radius of the point		ratio	<div><div>Unit</div><div>number</div></div> <div><div>Type</div><div>natural</div></div>					
SPECIES		Species of juvenile tree		nominal	<a href="#">Domain Info</a>					
STATUS		alive or dead		nominal	<a href="#">Domain Info</a>					

Involved Parties

Data Set Creators

Individual:

Dr. Carmen Tubbesing

Organization:

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Position:

Postdoctoral Scholar

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Individual:	Dr. Robert York
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### Data Set Contacts

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Email Address:	<a href="mailto:ctubbesing@berkeley.edu">ctubbesing@berkeley.edu</a>

### Data Set Characteristics

Geographic Region:									
Geographic Description:	Blodgett Forest Research Station								
Bounding Coordinates:	<table><tr><td>West:</td><td>-120.6 degrees</td></tr><tr><td>East:</td><td>-120.4794 degrees</td></tr><tr><td>North:</td><td>38.9 degrees</td></tr><tr><td>South:</td><td>38.9 degrees</td></tr></table>	West:	-120.6 degrees	East:	-120.4794 degrees	North:	38.9 degrees	South:	38.9 degrees
West:	-120.6 degrees								
East:	-120.4794 degrees								
North:	38.9 degrees								
South:	38.9 degrees								

Time Period:	
Begin:	2015
End:	2017

Taxonomic Range:		
Classification:	Rank Name:	Genus
	Rank Value:	Abies

	<table><tr><td>Classification:</td><td>Rank Name:</td><td>Species</td></tr><tr><td></td><td>Rank Value:</td><td>lowiana</td></tr><tr><td></td><td>Common Name:</td><td>White fir</td></tr></table>	Classification:	Rank Name:	Species		Rank Value:	lowiana		Common Name:	White fir			
Classification:	Rank Name:	Species											
	Rank Value:	lowiana											
	Common Name:	White fir											
Classification:	<table><tr><td>Rank Name:</td><td>Genus</td></tr><tr><td>Rank Value:</td><td>Arctostaphylos</td></tr><tr><td>Classification:</td><td><table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>patula</td></tr><tr><td>Common Name:</td><td>Greenleaf manzanita</td></tr></table></td></tr></table>	Rank Name:	Genus	Rank Value:	Arctostaphylos	Classification:	<table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>patula</td></tr><tr><td>Common Name:</td><td>Greenleaf manzanita</td></tr></table>	Rank Name:	Species	Rank Value:	patula	Common Name:	Greenleaf manzanita
Rank Name:	Genus												
Rank Value:	Arctostaphylos												
Classification:	<table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>patula</td></tr><tr><td>Common Name:</td><td>Greenleaf manzanita</td></tr></table>	Rank Name:	Species	Rank Value:	patula	Common Name:	Greenleaf manzanita						
Rank Name:	Species												
Rank Value:	patula												
Common Name:	Greenleaf manzanita												
Classification:	<table><tr><td>Rank Name:</td><td>Genus</td></tr><tr><td>Rank Value:</td><td>Ceanothus</td></tr><tr><td>Classification:</td><td><table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>cordulatus</td></tr><tr><td>Common Name:</td><td>Whitethorn</td></tr></table></td></tr></table>	Rank Name:	Genus	Rank Value:	Ceanothus	Classification:	<table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>cordulatus</td></tr><tr><td>Common Name:</td><td>Whitethorn</td></tr></table>	Rank Name:	Species	Rank Value:	cordulatus	Common Name:	Whitethorn
Rank Name:	Genus												
Rank Value:	Ceanothus												
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Rank Value:	integerrimus												
Common Name:	Deerbrush												
Classification:	<table><tr><td>Rank Name:</td><td>Genus</td></tr><tr><td>Rank Value:</td><td>Chamaebatia</td></tr><tr><td>Classification:</td><td><table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>foliolosa</td></tr><tr><td>Common Name:</td><td>Mountain misery</td></tr></table></td></tr></table>	Rank Name:	Genus	Rank Value:	Chamaebatia	Classification:	<table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>foliolosa</td></tr><tr><td>Common Name:</td><td>Mountain misery</td></tr></table>	Rank Name:	Species	Rank Value:	foliolosa	Common Name:	Mountain misery
Rank Name:	Genus												
Rank Value:	Chamaebatia												
Classification:	<table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>foliolosa</td></tr><tr><td>Common Name:</td><td>Mountain misery</td></tr></table>	Rank Name:	Species	Rank Value:	foliolosa	Common Name:	Mountain misery						
Rank Name:	Species												
Rank Value:	foliolosa												
Common Name:	Mountain misery												
Classification:	<table><tr><td>Rank Name:</td><td>Genus</td></tr><tr><td>Rank Value:</td><td>Notholithocarpus</td></tr><tr><td>Classification:</td><td><table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>densiflorus</td></tr><tr><td>Common Name:</td><td>Tanoak</td></tr></table></td></tr></table>	Rank Name:	Genus	Rank Value:	Notholithocarpus	Classification:	<table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>densiflorus</td></tr><tr><td>Common Name:</td><td>Tanoak</td></tr></table>	Rank Name:	Species	Rank Value:	densiflorus	Common Name:	Tanoak
Rank Name:	Genus												
Rank Value:	Notholithocarpus												
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Rank Name:	Species												
Rank Value:	densiflorus												
Common Name:	Tanoak												
Classification:	<table><tr><td>Rank Name:</td><td>Genus</td></tr><tr><td>Rank Value:</td><td>Pinus</td></tr><tr><td>Classification:</td><td><table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>ponderosa</td></tr><tr><td>Common Name:</td><td>Ponderosa pine</td></tr></table></td></tr></table>	Rank Name:	Genus	Rank Value:	Pinus	Classification:	<table><tr><td>Rank Name:</td><td>Species</td></tr><tr><td>Rank Value:</td><td>ponderosa</td></tr><tr><td>Common Name:</td><td>Ponderosa pine</td></tr></table>	Rank Name:	Species	Rank Value:	ponderosa	Common Name:	Ponderosa pine
Rank Name:	Genus												
Rank Value:	Pinus												
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Rank Name:	Species												
Rank Value:	ponderosa												
Common Name:	Ponderosa pine												



# Sampling, Processing and Quality Control Methods

Step by Step Procedures	
Step 1:	
Description:	<div><b>Wildfire footprint sample locating</b></div> <div><p>Our site selection objective was to identify post-fire shrub fields across a range of fire footprint ages in order to capture gradients of shrub maturity, cover, and height. Because shrub-free areas are rare in stand-replacing fire patches of the Sierra Nevada, we quantified juvenile conifer growth across a gradient of shrub competition rather than comparing high-shrub areas to shrub-free areas. To ensure that environmental conditions were similar across sites, we limited sites to fire footprints that met the following requirements: between the North and South forks of the American River; greater than 400 ha in size; 5-50 years old; within the Tahoe or Eldorado National Forests; not planted or herbicided following fire; and containing identifiable shrub fields surrounded by mixed conifer forest according to satellite imagery. We identified five fire footprints that met these criteria. At the time of first field measurements (2016) the fires ranged in age from 8 to 35 years.</p><p>We located shrub patches using Google satellite imagery. We visited all accessible shrub-dominated patches that were greater than 1 ha in size, approximated using Google satellite imagery analyzed in QGIS 2.18.13. Only those shrub patches that contained juvenile conifers farther than 20 m from patch edge were measured. At each shrub patch, field crews located white fir and ponderosa pine seedlings and saplings 10-300 cm in height located at least 20 m from live adult trees. Juvenile trees that appeared to have been affected by herbivory or physical disturbance were ignored.</p></div>
Instrument(s):	A laser range finder was used to measure distance from overstory trees. The iPhone app Avenza was used to mark tree locations. A meter stick was used to measure juvenile conifer height.
Step 2:	
Description:	<div><b>Measurements in wildfire footprints</b></div> <div><p>Juvenile conifers were tagged, GPS pinned, and measured for height and diameter. We then measured annual vertical growth based on distances between bud scars for the 2015, 2016, and 2017 growing seasons. Shrub cover surrounding each juvenile conifer was measured for each shrub species using the line-intercept method along three-meter transects facing each of the four cardinal directions. We chose three meters for transect lengths because it represents the distance at which two-meter-tall shrubs (the approximate maximum shrub height in our study area) would block sunlight from reaching the base of the focal tree for all sunlight &lt;33° from horizontal. Measurements were conducted in 2016 and 2017.</p></div>
Instrument(s):	Diameter was measured using an analog hand calipers. Shrub transects were measured using a reel tape.
Step 3:	
Description:	<div><b>Mortality study</b></div> <div><p>We sampled from Blodgett Experimental Forest because it was impractical to sample a sufficiently large size of dead trees in the wildfire footprint shrub patches. The Blodgett units we sampled from were majority Site Classes III (a measure of site productivity, Skovsgaard and Vanclay 2008) with some area in Site Class IV, making them similar to our fire footprints, which had 63% of samples in Site Class III and 22% of samples in Site Class IV.</p><p>We surveyed live and dead juvenile tree densities across 275 plots making up 864 m2 of area and hundreds of trees, yet we found fewer than 30 dead trees of each species. To capture adequate sample sizes of dead trees, we combined this plot survey with targeted sampling of equal numbers live and dead trees for more detailed growth measurements. Thus, two types of data were gathered: 1) a survey of live and dead juvenile tree densities, and 2) growth rates of live and dead juvenile trees paired by species, proximity, and height.</p><p>For the survey of live and dead tree densities, we placed evenly spaced 1-m radius circular plots on a 20x30 m grid across two study units at Blodgett Forest. In each plot, we counted live and dead white fir and ponderosa pine in each plot that were &lt; 200 cm tall.</p></div>

To sample growth rates of paired live and dead juvenile trees, we walked along pre-determined parallel lines running east-west in the two study units, each separated by 20 m. As we walked, we searched for dead white fir and ponderosa pine juvenile trees < 200 cm in height as we walked. When we located a dead juvenile tree, we measured its height, diameter, and the past three years of growth by measuring distance between bud scars. We also photographed each tree and recorded details of its physical characteristics such as twig retention, bark status, and needle color to help estimate its year of death. We then located the nearest living conspecific tree whose height was within 10 cm of the height of the dead tree and performed the same measurements. We harvested the live and dead trees at soil level to perform dendrochronological measurements, which were used to help identify year of death.

Data Set Usage Rights

Additional Metadata

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additionalMetadata
|__element 'metadata'
|   |__element 'enityWizard'
|   |   |__element 'tracingChange'
|   |   |   |__text 'true'
|   |   |__text '\n '
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