# Caltrans **Wildfire Vulnerability** Highway Assessment

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# Summary

This project was conducted to assess the vulnerability and risk of wildfire to Caltrans-owned state highways. Data sources were sought across the board to analyze a variety of factors that contribute to wildfire and its spread. Analysis included data sets from CAL FIRE, US Department of Agriculture, US Census Bureau, and Caltrans. The resulting analysis found segments along Caltrans state highways that could benefit from fuel load reduction in order to create defensible space along the rights-of-way.

This project was made possible by a partnership between Caltrans and Davey Resource Group, Inc. Caltrans provided guidance throughout the project to ensure Davey Resource Group, Inc. had ample data and information to complete a thorough study of Caltrans state highways.

# Description

Through advanced geospatial analysis, Caltrans and Davey Resource Group completed a priority-based risk assessment of Caltrans state highways to model the risk and vulnerability of road segments that fall within Caltrans jurisdiction. Data used in the model varied in their temporal resolution as well as spatial resolution. To normalize the spatial resolution, Davey Resource Group, Inc. converted all data to raster formats and set the resolution at 30m with a projection of NAD 1983 Albers. The data sets were created state-wide for this analysis.

Each data source utilized the most current version. US Census data was taken from the 5-year American Community Survey (ACS) estimates ranging from 2013-2017. US Department of Agriculture data ranged from 2010-2018. CAL FIRE datasets were downloaded from their website with dates spanning from 2010-2019. Caltrans data included current data from 2018-2019. A description of the data sources can be found in the methodology (lineage) section of the metadata.

# Methodology

Using the CAL FIRE 45-day Report as a guide, Caltrans and Davey Resource Group, Inc. sought to create a similar priority guideline for Caltrans-owned rights-of-way. Data sources used in this assessment mirror those in the CAL FIRE 45-day report with the addition of Caltrans internal data for traffic volumes, highway classes, and emergency routes. This project took the principles of socio-economic analysis and vulnerable communities to complete a thorough assessment of the Caltrans rights-of-way going through these communities while also factoring in environmental risks of wildfire to natural resources (i.e. loss of trees, carbon storage, negatively impacting water supplies, etc.). However, instead of having a community-based focus, the goal of this analysis was to prioritize Caltrans highways that serve those communities in order to address fuel loading concerns. By prioritizing routes, Caltrans can work with other stakeholder groups to reduce fuels in and around these critical communities. By keeping evacuation routes clear, Caltrans can create defensible space and possibly save lives in the event of wildfire outbreaks.

To address route prioritization, a geospatial risk-based model was constructed by Davey Resource Group, Inc. during Summer/Fall 2019. Datasets were collected and assessed through a variety of sources (listed below). Davey Resource Group, Inc., in conjunction with Caltrans, deliberated each potential data source

to determine which pieces of information would be most beneficial to the model. Construction of the risk-based model was intended to identify priority routes or segments along Caltrans operated highways that could benefit from fuel load reductions in order to create defensible space along the rights-of-way.

All data was converted to 30m raster datasets to complete the analysis. An intra-dataset ranking was constructed for each variable in the model using values ranging from 0-7 (see Data Descriptions Section). A value of zero (0) was indicative of No Data. Lower values were reasoned by carrying less risk. A weighted overlay analysis was implemented to determine risk throughout the state. Data were summarized using a 1/10-mile buffer and calculating the average risk value within the buffer around all Caltrans operated state highways.

Each road segment was summarized for its average risk value within the buffered zone. The scores were then normalized by dividing the score by the highest score and multiplying by 100. This puts the scale in a easy 0-100 scale, where 100 is the highest priority. The normalized values were statistically binned into seven (7) classes within ArcGIS using Natural Breaks classification. The top 3 classes were deemed as the priority range for this analysis. With the priority segments identified, additional GIS analysis was performed to assign each segment a Caltrans District, Cal Fire Unit, California State Park, National Forest, BLM Unit, Tribal Land, and County, if applicable.

Data was also processed to include post mile markers for the closest ranges to give a better understanding of the location for each potential fuel reduction project.

| Group | Criteria | Raster Name | Last Update | Weighting |
|---|---|---|---|---|
| Caltrans | Average Daily Traffic Numbers (AADT) | AADT.tif | 2018 | 0.07 |
| | Highway Class | HighwayClass.tif | 2018 | 0.07 |
| | Lifeline Routes | EmergencyLifeRoute.tif | 2018 | 0.14 |
| Calfire | Fire Threat | Threat.tif | 2013 | 0.08 |
| | SRA / FHSZ | SRA_FHSZ.tif | 2018 | 0.05 |
| | Fire History | FireHistory.tif | 2018 | 0.05 |
| | Large Trees | LargeTrees.tif | 2015 | 0.05 |
| Census | Families in Poverty | FamiliesInPoverty.tif | 5-year American Community Survey 2013-2017 | 0.03 |
| | People with Disabilities | PeopleWithDisabilities.tif | 5-year American Community Survey 2013-2017 | 0.03 |
| | People that have Difficulty Speaking English | DifficultySpeakingEnglish.tif | 5-year American Community Survey 2013-2017 | 0.03 |
| | People over 65 | PeopleOver65.tif | 5-year American Community Survey 2013-2017 | 0.03 |
| | People Under 5 | PeopleUnder5.tif | 5-year American Community Survey 2013-2017 | 0.03 |

| | | | |
|---|---|---|---|
| | Households without a Car | NoTransportation.tif | 5-year American Community Survey 2013-2017 | 0.03 |
| | Housing Density | HousingDenisty.tif | 5-year American Community Survey 2013-2017 | 0.04 |
| USDA | WUI | WUI.tif | 2015 | 0.06 |
| | FRID | FRID.tif | 2017 | 0.06 |
| | Carbon Storage | CarbonStorage.tif | 2013 | 0.03 |
| | Wildfire Threat to Water | FireThreatToWater.tif | 2010 | 0.03 |
| | Surface Waters | SurfaceDrinkingWater.tif | 2010 | 0.03 |
| | Site Quality | SiteQuality.tif | 2019 | 0.03 |
| | Standing Timber | StandingTimber.tif | 2014 | 0.03 |

Weighted Overlay Equation (output created a statewide risk layer used in prioritization):
(0.07*"AADT.tif")+(0.07*"HighwayClass.tif")+(0.14*"EmergencyLifeRoute.tif")+(0.06*"WUI.tif")+(0.06*"FRID.tif")+(0.03*"FamiliesInPoverty.tif")+(0.03*"PeoplewithDisabilties.tif")+(0.03*"DifficultySpeakingEnglish.tif")+(0.03*"PeopleOver65.tif")+(0.03*"PeopleUnder5.tif")+(0.03*"NoTransportation.tif")+(0.04*"HousingDensity.tif")+(0.08*"Threat.tif")+(0.05*"SRA_FHSZ.tif")+(0.05*"FireHistory.tif")+(0.05*"LargeTrees.tif")+(0.03*"CarbonStorage.tif")+(0.03*"FireThreatToWater.tif")+(0.03*"SurfaceDrinkingWater.tif")+(0.03*"SiteQuality.tif")+(0.03*"StandingTimber.tif")

# Data Details

## Caltrans

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**Average Daily Traffic Numbers (AADT)**

*Source: Caltrans, created from 2017 AADT GIS data maintained by Caltrans, Division of Traffic Operations - provided by Andrew Lozano*
*Link: Contact Andrew Lozano (Caltrans)*
*Data Field: AvgAADT*

This layer provided average road usage as of 2017, aggregated between "Ahead" and "Back" average daily traffic numbers (ex. Northbound vs. Southbound). We separated the AvgAADT into seven (7) equal ranks, and those with higher AADT were assigned higher ranks.

| Caltrans - Average Daily Traffic Numbers (AADT) | |
|---|---|
| **Rank** | **Avg ADT Count** |
| 1 | 0-55,000 |
| 2 | 55,001-110,000 |

| 3 | 110,001-160,000 |
|---|---|
| 4 | 160,001-220,000 |
| 5 | 220,001-265,000 |
| 6 | 265,001-325,000 |
| 7 | 325,001+ |

## Highway Class

*Source: Maintained by Caltrans - provided by Andrew Lozano*
*"HighwayClassification_MetaData.docx"*
*Link: Contact Andrew Lozano (Caltrans)*
*Data Field: FUNCCL*

FUNCCL listed in Caltrans Metadata as "Item used to describe functional classification system" and is broken down into 17 different road classifications from unclassified, to rural road types, to urban types. These 17 classifications were concatenated and grouped into 7 classes in order to align with the scoring range. Higher rankings were given to Rural routes as opposed to interstates because interstates and other urban routes receive more attention due to higher volumes of daily traffic. Rural routes are often the only way in and out of small communities, making them paramount to the safe evacuation of those living in the areas, but due to lower volumes of traffic they are infrequently maintained.

| Caltrans - Highway Class | |
|---|---|
| **Rank** | **Description** |
| 1 | Urban Principal Arterial/Other Hwys or Expwys, Urban Principal Arterial – Interstate |
| 2 | Urban Other Principal Arterial |
| 3 | Urban Collector |
| 4 | Urban Minor Arterial |
| 5 | Rural Principal Arterial-Interstate |
| 6 | Rural Minor Arterial, Rural Other Principal Arterial |
| 7 | Rural Major Collector, Rural Minor Collector |

## Lifeline Routes

*Source: Maintained by Caltrans - provided by Andrew Lozano "HighwayClassification_MetaData.docx"*
*Link: Contact Andrew Lozano (Caltrans)*
*Data Field: LIFE*

In 1998, the Federal Emergency Management Agency (FEMA) and the American Society of Civil Engineers entered into a cooperative agreement to establish the American Lifelines Alliance (ALA) to facilitate the "creation, adoption and implementation of design and retrofit guidelines and other national consensus documents that, when implemented by lifeline owners and operators, will systematically improve the performance of utility and transportation systems to acceptable levels in natural hazard events, including earthquakes."

LIFE listed in Caltrans Metadata as "Item used to define Lifeline Routes on the State Highway System" assigned a 0 or 1 (Non-Lifeline vs. Lifeline). According to Caltrans Strategic Plan, Oct. 1994 - A Lifeline route is a route on the state highway system that is deemed so critical to emergency response/lifesaving activities of a region or state that is must remain open immediately following a major earthquake or for which preplanning for detour and/or expeditions repair and reopening can guarantee movement. The focus is on highly critical routes that allow for the immediate movement of emergency equipment and supplies into a region or through a region.

| Caltrans - Lifeline Routes | |
| --- | --- |
| Rank | Emergency Route |
| 1 | No |
| 7 | Yes |


# CAL FIRE
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**Fire Threat**
*Source: CalFire (FRAP)*
*Link: https://frap.fire.ca.gov/mapping/gis-data/*
*Data Field: Threat, Count*
CalFire metadata describes this layer as a "Statewide GIS layer in raster format of fire threat, which combines expected fire frequency with potential fire behavior to create four (4) threat classes". Data was expanded into six (6) rankings spanning from No Data to Very High threat levels by using the count field to break the data into equal classes. The higher the count/threat level, the higher ranking that was assigned.

| CalFire - Fire Threat | |
| --- | --- |
| Rank | Threat |
| 1 | No Data |

| | |
|---|---|
| 2 | Very Low |
| 3 | Low |
| 4 | Moderate |
| 5 | High |
| 6 | Very High |

## SRA (State Responsibility Areas) / FHSZ (Fire Hazard Severity Zones)

*Source:* CalFire (FRAP)

*Link:* https://hub.arcgis.com/datasets/MontereyCo::sra-fire-haz-zones-1

*Data Field:* Hazard Class

Data shows state responsibility areas that are the highest fire hazards. Within the data, there are four classes of hazards, ranging from No Data, Very Low to Very High. The highest ranking was assigned a seven (7) to keep consistent with the scoring ranks assigned throughout the project.

| CalFire - SRA / FHSZ | |
|---|---|
| **Rank** | **Hazard Class** |
| 1 | No Data - Very Low |
| 4 | Moderate |
| 6 | High |
| 7 | Very High |

## Fire History (Fire Perimeters)

*Source:* CalFire (FRAP)

*Link:* https://frap.fire.ca.gov/mapping/gis-data/

*Data Field:* Cause

This layer shows the spatial distribution of historical large fires, last updated May 1, 2019. From CalFire's project website: "The Fire and Resource Assessment Program (FRAP) compiles fire perimeters and has established an on-going fire perimeter data capture process. CAL FIRE, the United States Forest Service Region 5, the Bureau of Land Management, and the National Park Service jointly develop the fire perimeter GIS layer for public and private lands throughout California at the end of the calendar year. Upon release, the data is current as of the last calendar year". Data was concatenated into seven (7) cause classes, grouped by similarities to bring the count of classes down from 14. By looking at the frequency of each cause code, ranks were assigned from highest to lowest in terms of frequency as well to the circumstance of ignition.

| CalFire - Fire History |
|---|

| Rank | Hazard Class |
|------|--------------|
| 1 | Firefighter & Non-Firefighter Training, Structure, Aircraft, Illegal Alien Campfire |
| 2 | Escaped Prescribed Burn, Railroad |
| 3 | Playing with Fire |
| 4 | Unknown/Unidentified |
| 5 | Equipment Use, Arson |
| 6 | Lightning, Miscellaneous |
| 7 | Smoking, Campfire, Debris, Vehicle, Power Line |

## Large Trees

*Source:* CalFire (FRAP)

*Link:* https://frap.fire.ca.gov/mapping/gis-data/

*Data Field:* WHRSIZE - Wildlife Habitat Relationship Size Class (tree types only)

From metadata: "An accurate depiction of the spatial distribution of habitat types within California is required for a variety of legislatively-mandated government functions. The California Department of Forestry and Fire Protection's CALFIRE Fire and Resource Assessment Program (FRAP), in cooperation with the California Department of Fish and Wildlife Veg Camp program and extensive use of USDA Forest Service Region 5 Remote Sensing Laboratory (RSL) data, has compiled the "best available" land cover data available for California into a single comprehensive statewide data set. The data span a period from approximately 1990 to 2014. Typically, the most current, detailed and consistent data were collected for various regions of the state. Decision rules were developed that controlled which layers were given priority in areas of overlap. Cross-walks were used to compile the various sources into the common classification scheme, the California Wildlife Habitat Relationships (CWHR) system.". Size classes were broken down into seven (7) classes by DBH, starting with No Data areas, to Seedlings <1", and continuing up to Multi Layered: Size 5 with a Total Tree Crown > 60%.

| CalFire - Large Trees | |
|------|--------------|
| Rank | Size Class |
| 1 | Not Forest (urban, marsh, pastures,barren, etc) |
| 2 | Seedling: <1" dbh |
| 3 | Sapling: 1-6" dbh |
| 4 | Pole: 6-11" dbh |
| 5 | Small Tree: 11-24" dbh |
| 6 | Medium/Large Tree: >24" dbh |
| 7 | Multi Layered: Size 5 over Size 4 or 3: Total Tree Crown > 60% |

## US Census

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**Families in Poverty**

*Source:* US Census Bureau - Poverty Status of Families by Family Type in Last 12 Months: Census Data Table: B17010

*Link:* https://www.nhgis.org/documentation/tabular-data

*Data Field:* AH1KE002 - Income in the past 12 months below poverty level

Data shows the percentage of families in the census tract living below the poverty line in the past twelve months.

| US Census - Families in Poverty | |
|---|---|
| **Rank** | **Percent of Census Tract** |
| 1 | 0-5% |
| 2 | 5.01-15% |
| 3 | 15.01-30 |
| 4 | 30.01-45% |
| 5 | 45.01-60% |
| 6 | 60.01-75% |
| 7 | 75.01% + |

**People with Disabilities**

*Source:* US Census Bureau - Sex by Disability Age: Census Data Table B18101

*Link:* https://www.nhgis.org/documentation/tabular-data

*Data Field:* AIG0E001: Total with disability

Data shows the Percentage of population in census tract estimated to have a disability; based on self-reporting.

| US Census - People with Disabilities | |
|---|---|
| **Rank** | **Percent of Census Tract** |
| 1 | 0-5% |
| 2 | 5.01-15% |
| 3 | 15.01-30% |
| 4 | 30.01-45% |
| 5 | 45.01-60% |
| 6 | 60.01-75% |
| 7 | 75.01% + |

**People that have Difficulty Speaking English**

*Source:* US Census Bureau - Language Spoken at Home for the Population 5 years and Over: Census Data Table C16001

*Link:* *https://www.nhgis.org/documentation/tabular-data*

*Data Field:* *AIE7 - Speak English less than 'very well' fields*

Data shows percentage of population in the census tract estimates to have difficulty speaking English.

| US Census - People that have difficulty speaking English | |
|---|---|
| **Rank** | **Percent of Census Tract** |
| 1 | 0-10% |
| 2 | 10.01-20% |
| 3 | 20.01-30% |
| 4 | 30.01-40% |
| 5 | 40.01-50% |
| 6 | 50.01-60% |
| 7 | 60.01% + |

## People Over 65

*Source:* *US Census Bureau - Sex by Age: Census Data Table B01001*

*Link:* *https://www.nhgis.org/documentation/tabular-data*

*Data Field:* *AHYQM020-25 Males 65+, AHYQM044-49 Females, 65+*

Data shows percentage of population in the census tract over the age of 65; indicates elderly.

| US Census - People over 65 | |
|---|---|
| **Rank** | **Percent of Census Tract** |
| 1 | 0-5% |
| 2 | 5.01-15% |
| 3 | 15.01-30 |
| 4 | 30.01-45% |
| 5 | 45.01-60% |
| 6 | 60.01-75% |
| 7 | 75.01% + |

## People Under 5

*Source:* *US Census Bureau - Sex by Age: Census Data Table B01001*

*Link:* *https://www.nhgis.org/documentation/tabular-data*

*Data Field:* *AHYQM003: Male: Under 5 years, AHYQM027: Female Under 5 years*

Data shows percentage of population in the census tract under the age of 5; indicates young children.

| US Census - People Under 5 | |
|---|---|
| **Rank** | **Percent of Census Tract** |
| 1 | 0-1% |
| 2 | 1.01-5% |
| 3 | 5.01-10% |
| 4 | 10.01-15% |
| 5 | 15.01-20% |
| 6 | 20.01-25% |
| 7 | 25% + |

## Households without a Car

*Source:* US Census Bureau - Means of Transportation to Work by Vehicles Available: Census Data Table B08141

*Link:* https://www.nhgis.org/documentation/tabular-data

*Data Field:* AICLE002: No vehicle available

Data shows percentage of population in the census tract without a car.

| US Census - Households without a Car | |
|---|---|
| **Rank** | **Percent of Census Tract** |
| 1 | 0-5% |
| 2 | 5.01-15% |
| 3 | 15.01-30 |
| 4 | 30.01-45% |
| 5 | 45.01-60% |
| 6 | 60.01-75% |
| 7 | 75.01% + |

## Housing Density

*Source:* US Census Bureau - Housing Units: Census Data Table B25001

*Link:* https://www.nhgis.org/documentation/tabular-data

*Data Field:* AH35M001: Total

Data shows total housing units per acre.

| US Census - Housing Density | |
|---|---|
| Rank | Housing Units per Acre |
| 1 | 0-1 |
| 2 | 1.01-5 |
| 3 | 5.01-10 |
| 4 | 10.01-25 |
| 5 | 25.01-50 |
| 6 | 50.01-100 |
| 7 | 100.01-153 |

# USDA

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**WUI - Wildland Urban Interface**

*Source:* USFS - 2010 Wildland Urban Interface of the Conterminous United States

*Link:* https://data.nal.usda.gov/search/type/dataset

*Data Field:* WUICLASS10

WUICLASS10 listed in metadata as Wildland-Urban Interface class: Classified by housing density. From USDA: "The wildland-urban interface (WUI) is the area where houses meet or intermingle with undeveloped wildland vegetation. This makes the WUI a focal area for human-environment conflicts such as wildland fires, habitat fragmentation, invasive species, and biodiversity decline. Using geographic information systems (GIS), we integrated U.S. Census (2010) and USGS National Land Cover Data (2006), to map the Federal Register definition of WUI (Federal Register 66:751, 2001) for the conterminous United States. These data are useful within a GIS for mapping and analysis at national, state, and local levels." Ranks were assigned from 1-7 to match the scoring schema, and those with higher vegetation classifications were assigned a higher score.

| USDA - WUI | |
|---|---|
| Rank | WUI Classification |
| 1 | No Veg/Water |
| 2 | Uninhabited Veg |
| 3 | Very Low Veg Density |
| 4 | Low Veg Density |
| 5 | Low/Medium Veg Density Intermix |
| 6 | Medium Veg Density Interface |
| 7 | High Veg Density Interface/Intermix |

**FRID - Fire Return Interval Departure**

*Source:* *USFS - Region 5, Land & Resource Management*

*Link:* *https://www.fs.usda.gov/detail/r5/landmanagement/gis/?cid=STELPRDB5327836*

*Data Field:* *NPS_FRID_Index*

This data layer shows the Fire Return Interval Departure signaling times since the last fire occurred and an expected recurrence in an area. From USFS - "This polygon layer consists of information compiled about fire return intervals for major vegetation types on the 18 National Forests in California and adjacent land jurisdiction. Comparisons are made between pre-Euro American settlement and contemporary fire return intervals (FRIs). Current departures from the pre-Euro American settlement FRIs are calculated based on mean, median, minimum, and maximum FRI values. This map is from a project of the USFS Pacific Southwest Region Ecology Program." Ranks were assigned from 1-7, with higher rankings assigned to areas with a higher FRID Index, or higher frequency of recurring fires per area.

| USDA - FRID | |
|---|---|
| **Rank** | **FRID Index** |
| 1 | No Data |
| 2 | 0.33+ |
| 3 | -0.74 - 0.32 |
| 4 | -2.20 - -0.75 |
| 5 | -4.15 - -2.21 |
| 6 | -6.72 - -4.16 |
| 7 | -8.91 - -6.73 |

**Carbon Storage (of Living Trees Above Ground)**

*Source:* *USDA - Forest carbon stocks of the contiguous United States (2000-2009)*

*Link:* *https://www.fs.usda.gov/rds/archive/catalog/RDS-2013-0004*

*Data Field:* *Above Ground Forest Biomass (Megagrams/Hectare (mg/ha))*

From publication Abstract: "Through application of a nearest-neighbor imputation approach, mapped estimates of forest carbon density were developed for the contiguous United States using the annual forest inventory conducted by the USDA Forest Service Forest Inventory and Analysis (FIA) program, MODIS satellite imagery, and ancillary geospatial datasets." Data was broken down into seven (7) categories and has also been converted into tons/acre for ease of understanding and can be implemented into analysis should this be the chosen route.

| USDA - Carbon Storage | |
|---|---|
| **Rank** | **Above Ground Forest Biomass (mg/ha)** |
| 1 | 0-15 |
| 2 | 15-50 |
| 3 | 50-100 |
| 4 | 100-150 |

| | |
|---|---|
| 5 | 150-200 |
| 6 | 200-600 |
| 7 | 600+ |

## Wildfire Threat to Water

*Source:* *USDA - Forest2Faucets*

*Link:* *https://www.fs.fed.us/ecosystemservices/FS_Efforts/GetF2FData/index.php*

*Data Field:* *3_FIR_FOR in F2F_outputs.dbf*

From the USDA: "For this analysis, areas were included that ranked as having high or very high wildland fire potential. Fire affects watershed stability and water quality differently depending on many factors including geographic region, distance of fire to water source, local topography, soil type, slope, and weather patterns. In addition, forest fire is a natural process and is critically important to the natural functioning of many forests. When interpreting the output map, it is important to consider this."

| USDA - Wildfire Threat to Water | |
|---|---|
| **Rank** | **Percentage** |
| 1 | 0-10% |
| 2 | 10.01-20% |
| 3 | 20.01-30% |
| 4 | 30.01-40% |
| 5 | 40.01-50% |
| 6 | 50.01-60% |
| 7 | 60.01% + |

## Surface Waters

*Source:* *USDA - Forest2Faucets*

*Link:* *https://www.fs.fed.us/ecosystemservices/FS_Efforts/GetF2FData/index.php*

*Data Field:* *1IMP in F2F_outputs.dbf*

From the USDA: "The USDA Forest Service Forests to Faucets project uses GIS to model and map the continental United States land areas most important to surface drinking water, the role forests play in protecting these areas, and the extent to which these forests are threatened by development, insects and disease, and wildland fire."

| USDA - Surface Waters | |
|---|---|
| **Rank** | **Percentage** |
| 1 | 0-15% |
| 2 | 15.01-30% |
| 3 | 30.01-45% |
| 4 | 45.01-60% |
| 5 | 60.01-75% |
| 6 | 75.01-90% |
| 7 | 90.01% + |

**Site Quality**

*Source:* USDA - FIA (Forest Inventory Analysis) County Estimates 2017

*Link:*
https://data.fs.usda.gov/geodata/edw/datasets.php?xmlKeyword=FIA+Landcover+County+Estimates

*Data Field:* Average Annual Net Growth (in cubic feet)

"This feature class represents forest area estimates (and percent sampling error) by county for the year 2017. Features and attributes of the county layer were adapted to match attributes within the FIA database (FIADB) and features have been generalized by removing vertices to enhance performance. Future iterations of this dataset will be produced using refined methods and higher resolution spatial data. Productivity of forestland based on potential volume of wood that can be produced per acre in a year." Data was broken into seven (7) equal categories by quantities of cubic feet. Those with higher average annual net growth were given higher rankings.

| USDA - Site Quality | |
| --- | --- |
| **Rank** | **Average Annual Net Growth (in cubic feet)** |
| 1 | All Negative Values |
| 2 | 0-1,000,000 |
| 3 | 1,000,000-5,000,000 |
| 4 | 5,000,000-15,000,000 |
| 5 | 15,000,000-30,000,000 |
| 6 | 30,000,000-70,000,00 |
| 7 | 70,000,000+ |

**Standing Timber**

*Source:* Oregon State University (LEMMA) - Uses FIA Data from USDA

*Link:* https://lemma.forestry.oregonstate.edu/data/structure-maps

*Data Field:* BA_G3

From metadata: "Digital Gradient Nearest Neighbor (GNN) imputation maps are provided as 30m-resolution ArcGIS grids, where the grid value is a unique plot number that links to the plot database. Selected vegetation variables from the plot database are joined as items in the grid to facilitate viewing and exploratory spatial analysis. Metadata for the vegetation variables are included with the grids and in the plot database. Dates for maps developed from GNN species-size models are determined by the vintage of the satellite imagery used in their development.". Data was categorized by Basal Area and split into seven (7) equal categories.

| Oregon State University (LEMMA) - Standing Timber | |
| --- | --- |
| **Rank** | **Basal Area** |
| 1 | 0-6 |
| 2 | 6-17 |
| 3 | 17-30 |

| | |
|---|---|
| 4 | 30-43 |
| 5 | 43-60 |
| 6 | 60-83 |
| 7 | 83+ |