California Fire Return Interval Departure (FRID) map metadata: description of purpose, data sources, database fields, and their calculations

Theme: Comparison of historic and current fire frequencies
Place: California National Forests and adjacent jurisdictions

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Abstract
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 jurisdictions. Comparisons are made between pre-Euroamerican settlement and contemporary fire return intervals (FRIs). Current departures from the pre-Euroamerican settlement FRIs are calculated based on mean, median, minimum, and maximum FRI values. This map is a project of the USFS Pacific Southwest Region Ecology Program (http://fsweb.r5.fs.fed.us/program/ecology/).

Purpose
This layer may be used for land and resource planning and assessment, as well as other natural resource applications such as fuels treatment planning, postfire restoration project design, management response to fire, and general ecological understanding of the historic and current occurrence of fire on the California National Forests and neighboring jurisdictions.

Supplementary information
Information on pre-Euroamerican settlement FRIs was compiled from an exhaustive review of the fire history literature, expert opinion, and vegetation modeling (see Table 4). Contemporary FRIs were calculated using the California Interagency Fire Perimeters database (maintained by the California Department of Forestry and Fire Protection [CalFire-FRAP]). The vegetation type stratification was based on the CALVEG map (USDA Forest Service Remote Sensing Lab) for the California National Forests, grouped into 28 pre-settlement fire regime (PFR) types. PFRs are based primarily on the LANDFIRE "Biophysical Settings", which are vegetation types associated with defined fire regimes (see below). See CALVEG mapping metadata (http://www.fs.fed.us/r5/rsl/clearinghouse/data.shtml) and CalFire-FRAP Fire Perimeters

database metadata (http://www.frap.cdf.ca.gov/data/frapgisdata/select.asp) for data limitations in these datasets. See below for metadata pertaining to each field in the GIS database.

Details about specific GIS database fields
YLF: "Year of Last Fire." This is year in which the polygon in question last experienced a fire that was recorded in the fire perimeter database. The fire perimeter database is not a perfect record of fire, and some regions in California are missing GIS data on all but the largest fires before the 1950's. Most of the State is relatively complete for large and medium fires occurring after 1908 however, and we use this year as the baseline year for the FRID database.

TSLF: "Time Since Last Fire." This is the number of years elapsed between the most recent fire recorded in the fire perimeters database and the version year of the FRID map being used. If the version year of the FRID map is 2010, and the polygon in question last burned in 1995, TSLF will read 15 (2010 minus 1995).

numFires: "Number of Fires." The number of fires (according to the fire perimeters database) that occurred within a given polygon between 1908 and the version year of the FRID map being used. Small fires (generally <4 ha after 1950, <40 ha prior to 1950, see http://www.frap.cdf.gov/data/frapgisdata/select.asp for more info) are not included in this database, so this number may be an underestimate of actual post-1908 fire frequencies.

PFR: "Presettlement Fire Regime." This field is a crosswalk from the current vegetation type to its probable historical fire regime (by "historical", we refer to the three or four centuries before Euroamerican settlement). Each PFR is named for the dominant vegetation type supported by that PFR (Tables 1 and 2). There are currently 28 PFRs in the FRID database, developed through consultation with California fire and vegetation ecologists and with reference to – among other sources – Stephenson and Calcarone (1999), Sugihara et al. (2006), Barbour et al. (2007), LANDFIRE (2010), and Sawyer et al. (2010). The original framework for the PFRs came from the Southern California Mountains and Foothills Assessment (SCFMA) (Stephenson and Calcarone 1999), which summarized ecosystem status and trend for the four southern California National Forests in preparation for Forest Planning. A basic framework of vegetation types ("ecological communities") was developed by the SCMFA, and this formed the basis for our first generation FRID maps, which were product of a 2006-2007 TNC-US Forest Service collaborative pilot project in southern California. The LANDFIRE project was just beginning at this point, and preliminary fire regime descriptions for major vegetation types had been developed via regional expert workshops for much of California; for southern California, the SCMFA results formed a basic framework for the LANDFIRE vegetation typing. The update process for the Manual of California Vegetation (MCV) was also underway, and it also generated fire regime summaries from regional expert workshops. We used both of these sources to refine and expand the SCFMA vegetation typing and to apply fire frequency values to the types that were common enough to be mapped.

In 2009 we expanded the FRID mapping to the entire state of California, which required a major expansion in the scope of the vegetation typing. By that point the MCV and LANDFIRE fire regime typing efforts had been completed. Our current list of PFRs is based on these efforts, principally the latter, but with reference to the other sources cited above as well. Table 1 provides a crosswalk between our PFRs and the LANDFIRE fire regime types ("Biophysical

Settings", or "BpS") mapped in California. See: http://www.landfire.gov/ for more information on BpS development and data.

We mapped PFRs using the Forest Service CALVEG mapping classification; a crosswalk table is provided in Table 2. In most cases, multiple similar vegetation types (as identified by the CALVEG classification) are grouped within PFRs due to their similar relationship with fire. For example, the "yellow pine" PFR includes seven CALVEG types; the "chaparral and serotinous conifer" PFR includes 34 different CALVEG vegetation types (Table 2). Pre-Euroamerican settlement FRIs for most vegetation types in California can be estimated from dendrochronological and charcoal deposition records, although information is limited for some vegetation types (i.e. Coastal Dune, Coastal Sage Scrub, Desert Mixed Shrub). In some areas, such as southern California, there is little reliable information about pre-settlement distribution of vegetation types, so a current vegetation map (CALVEG) is used as the best available approximation. Some areas of the State used to support fire regimes and vegetation types that no longer exist there (i.e. Bigcone Douglas-Fir stands that have been converted to Chaparral, Chaparral and Coastal Sage Scrub stands that have been converted to grassland, desert vegetation types that now burn frequently due to invasion by cheat grass, yellow pine forests that have converted to mixed conifer due to lack of disturbance, etc.). In some cases this may complicate comparisons between pre-settlement and contemporary FRIs for areas which are currently dominated by non-analog vegetation types and fire regimes. Although areas mapped as grasslands and meadows are included in the GIS layer, FRI and departure statistics are not calculated for these types because reliable information about pre-Euroamerican settlement fire regimes is lacking.

Table 1. Crosswalk table between Presettlement Fire Regime types (PFRs) and LANDFIRE Biophysical Settings (BpS) mapped in California. BpS types with "none" as PFR assignment are riparian, meadow, and grassland types for which we did not feel comfortable assigning statewide means and ranges for fire frequencies, due, e.g., to lack of credible data or to major local and/or regional differences in estimated historical fire frequencies within the BpS.

LANDFIRE Biophysical Setting Name	PFR
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	Aspen
Rocky Mountain Aspen Forest and Woodland	Aspen
Columbia Plateau Steppe and Grassland	Big sagebrush
Inter-Mountain Basins Big Sagebrush Shrubland	Big sagebrush
Inter-Mountain Basins Big Sagebrush Steppe	Big sagebrush
Inter-Mountain Basins Montane Sagebrush Steppe	Big sagebrush
Columbia Plateau Low Sagebrush Steppe	Black and low sagebrush
Great Basin Xeric Mixed Sagebrush Shrubland	Black and low sagebrush
California Coastal Closed-Cone Conifer Forest and Woodland	Chaparral/serotinous conifers
California Maritime Chaparral	Chaparral/serotinous conifers
California Mesic Chaparral	Chaparral/serotinous conifers
California Xeric Serpentine Chaparral	Chaparral/serotinous conifers
Klamath-Siskiyou Xeromorphic Serpentine Savanna and Chaparral	Chaparral/serotinous conifers
Mediterranean California Mesic Serpentine Woodland and Chaparral	Chaparral/serotinous conifers
Northern and Central California Dry-Mesic Chaparral	Chaparral/serotinous conifers
Southern California Dry-Mesic Chaparral	Chaparral/serotinous conifers
Baja Semi-Desert Coastal Succulent Scrub	Coastal sage scrub

Northern California Coastal Scrub	Coastal sage scrub
Southern California Coastal Scrub	Coastal sage scrub
Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	Curl-leaf mountain mahogany
Colorado Plateau Blackbrush-Mormon-tea Shrubland	Desert mixed shrub
Inter-Mountain Basins Greasewood Flat	Desert mixed shrub
Inter-Mountain Basins Mixed Salt Desert Scrub	Desert mixed shrub
Inter-Mountain Basins Semi-Desert Shrub-Steppe	Desert mixed shrub
Mojave Mid-Elevation Mixed Desert Scrub	Desert mixed shrub
Sonora-Mojave Creosotebush-White Bursage Desert Scrub	Desert mixed shrub
Sonora-Mojave Mixed Salt Desert Scrub	Desert mixed shrub
Sonoran Mid-Elevation Desert Scrub	Desert mixed shrub
Sonoran Paloverde-Mixed Cacti Desert Scrub	Desert mixed shrub
Mediterranean California Dry-Mesic Mixed Conifer Forest and Woodland	Dry mixed conifer
Northern Rocky Mountain Foothill Conifer Wooded Steppe	Dry mixed conifer
North Pacific Hypermaritime Western Red-cedar-Western Hemlock Forest	Fire sensitive spruce or fir
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland	Lodgepole pine
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland - Dry	Lodgepole pine
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland - Wet	Lodgepole pine
Central and Southern California Mixed Evergreen Woodland	Mixed evergreen
Mediterranean California Mixed Evergreen Forest	Mixed evergreen
Klamath-Siskiyou Upper Montane Serpentine Mixed Conifer Woodland	Moist mixed conifer
Mediterranean California Mesic Mixed Conifer Forest and Woodland	Moist mixed conifer
California Montane Woodland and Chaparral	Montane chaparral
California Central Valley and Southern Coastal Grassland	none
California Central Valley Riparian Woodland and Shrubland	none
California Mesic Serpentine Grassland	none
California Montane Riparian Systems	none
California Northern Coastal Grassland	none
Inter-Mountain Basins Montane Riparian Systems	none
Inter-Mountain Basins Semi-Desert Grassland	none
Mediterranean California Alpine Dry Tundra	none
Mediterranean California Alpine Fell-Field	none
Mediterranean California Subalpine Meadow	none
North American Warm Desert Riparian Systems	none
North Pacific Montane Grassland	none
Pacific Coastal Marsh Systems	none
California Central Valley Mixed Oak Savanna	Oak woodland
California Coastal Live Oak Woodland and Savanna	Oak woodland
California Lower Montane Blue Oak-Foothill Pine Woodland and Savanna	Oak woodland
Mediterranean California Mixed Oak Woodland	Oak woodland
North Pacific Oak Woodland	Oak woodland
Southern California Oak Woodland and Savanna	Oak woodland
Columbia Plateau Western Juniper Woodland and Savanna	Pinyon juniper
Colorado Plateau Pinyon-Juniper Woodland	Pinyon-juniper
Great Basin Pinyon-Juniper Woodland	Pinyon-juniper

Inter-Mountain Basins Juniper Savanna	Pinyon-juniper
Mediterranean California Red Fir Forest	Red fir
Mediterranean California Red Fir Forest - Cascades	Red fir
Mediterranean California Red Fir Forest - Southern Sierra	Red fir
California Coastal Redwood Forest	Redwood
Great Basin Semi-Desert Chaparral	Semi-desert chaparral
Sonora-Mojave Semi-Desert Chaparral	Semi-desert chaparral
North Pacific Hypermaritime Sitka Spruce Forest	Spruce-hemlock
North Pacific Lowland Riparian Forest and Shrubland	Spruce-hemlock
North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest	Spruce-hemlock
North Pacific Maritime Mesic-Wet Douglas-fir-Western Hemlock Forest	Spruce-hemlock
Inter-Mountain Basins Subalpine Limber-Bristlecone Pine Woodland	Subalpine forest
Mediteranean California Subalpine Woodland	Subalpine forest
Mediterranean California Subalpine Woodland	Subalpine forest
North Pacific Maritime Mesic Subalpine Parkland	Subalpine forest
Northern California Mesic Subalpine Woodland	Subalpine forest
Sierra Nevada Alpine Dwarf-Shrubland	Subalpine forest
Sierran-Intermontane Desert Western White Pine-White Fir Woodland	Western white pine
California Montane Jeffrey Pine(-Ponderosa Pine) Woodland	Yellow pine
Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Yellow pine
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna - Mesic	Yellow pine
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna - Xeric	Yellow pine

Table 2. Crosswalk table for assignment of CALVEG vegetation dominance types to Presettlement Fire Regime types (PFRs). CALVEG types with "none" as PFR assignment are types for which we do not have reasonable or credible data on presettlement fire regimes, or for which a PFR is nonsensical. Riparian types, meadows, and grasslands are included in this group.

CALVEG Code	CALVEG Type	PFR ("Presettlement Fire Regime")	CALVEG Code	CALVEG Type	PFR ("Presettlement Fire Regime")
KQ	Aspen (shrub)	Aspen	SY	Chaparral Yucca	Chaparral/serotinous conifers
QQ	Quaking Aspen	Aspen	MG	Gowen Cypress	Chaparral/serotinous conifers
QS	Willow - Aspen	Aspen	MI	Piute Cypress	Chaparral/serotinous conifers
BR	Rabbitbrush	Big sagebrush	NI	Nissenan Manzanita	Chaparral/serotinous conifers
BS	Basin Sagebrush	Big sagebrush	PR	Monterey Pine	Chaparral/serotinous conifers
TT	Big Basin Sagebrush	Big sagebrush	PM	Bishop Pine	Chaparral/serotinous conifers
TV	Mountain Sagebrush	Big sagebrush	PT	Torrey Pine	Chaparral/serotinous conifers
TW	Wyoming Sagebrush	Big sagebrush	SM	Sumac Shrub	Chaparral/serotinous conifers
BB	Bitterbrush	Big sagebrush	BX	Great Basin - Mixed Chaparral Transition	Chaparral/serotinous conifers
TB	Bitterbrush - Sagebrush	Big sagebrush	WM	Birchleaf Mountain Mahogany	Chaparral/serotinous conifers
KL	Winter Fat	Big sagebrush	CK	Coyote Brush	Chaparral/serotinous conifers
TR	Rothrock Sagebrush	Big sagebrush	NC	North Coast Mixed Shrub	Chaparral/serotinous conifers
BQ	Great Basin Mixed Scrub	Big sagebrush	CQ	Lower Montane Mixed Chaparral	Chaparral/serotinous conifers
TS	Snowberry	Big sagebrush	DG	Douglas-Fir - Grand Fir	Coastal fir
DM	Bigcone Douglas-Fir	Bigcone Douglas-fir	GF	Grand Fir	Coastal fir
TN	Black Sagebrush	Black and Low sagebrush	SP	Sage (Salvia spp.)	Coastal sage scrub
BL	Low Sagebrush	Black and Low sagebrush	SS	California Sagebrush	Coastal sage scrub
JC	California Juniper (shrub)	California juniper	SE	Encelia Scrub	Coastal sage scrub
JT	California Juniper (tree)	California juniper	SH	Coastal Bluff Scrub	Coastal sage scrub
AN	Mendocino Manzanita	Chaparral/serotinous conifers	SB	Buckwheat	Coastal sage scrub
CA	Chamise	Chaparral/serotinous conifers	BM	Curlleaf Mountain Mahogany	Curl-leaf mountain mahogany
CC	Ceanothus Mixed Chaparral	Chaparral/serotinous conifers	FM	Curlleaf Mountain Mahogany (tree)	Curl-leaf mountain mahogany
CR	Red Shanks Chaparral	Chaparral/serotinous conifers	DA	Blackbush	Desert mixed shrub
CS	Scrub Oak	Chaparral/serotinous conifers	BZ	Great Basin - Desert Mixed Scrub	Desert mixed shrub
KP	Knobcone Pine	Chaparral/serotinous conifers	DO	Ocotillo	Desert mixed shrub
PC	Coulter Pine	Chaparral/serotinous conifers	DV	Desert Mixed Succulent Shrub	Desert mixed shrub
MC	Cuyamaca Cypress	Chaparral/serotinous conifers	AD	White Bursage	Desert mixed shrub
MM	Monterey Cypress	Chaparral/serotinous conifers	DL	Creosote Bush	Desert mixed shrub
MN	McNab Cypress	Chaparral/serotinous conifers	DC	Cholla	Desert mixed shrub
MO	Baker Cypress	Chaparral/serotinous conifers	DI	Indigo Bush	Desert mixed shrub
MS	Sargent Cypress	Chaparral/serotinous conifers	DX	Desert Mixed Shrub	Desert mixed shrub
MT	Tecate Cypress	Chaparral/serotinous conifers	ET	Elephant Tree	Desert mixed shrub
MY	Pygmy Cypress	Chaparral/serotinous conifers	HS	Cheesebush	Desert mixed shrub
MZ	Santa Cruz Cypress	Chaparral/serotinous conifers	DB	Desert Buckwheat	Desert mixed shrub
C1	Ultramafic Mixed Shrub	Chaparral/serotinous conifers	NB	Desert Mixed Wash Shrub	Desert mixed shrub
CD	Southern Mixed Chaparral	Chaparral/serotinous conifers	NQ	High Desert Mixed Scrub	Desert mixed shrub
CL	Wedgeleaf Ceanothus	Chaparral/serotinous conifers	SI	Bladderpod	Desert mixed shrub
CW	Whiteleaf Manzanita	Chaparral/serotinous conifers	UI	Desert Ironwood	Desert mixed shrub
SD	Manzanita Chaparral	Chaparral/serotinous conifers	UJ	Joshua Tree	Desert mixed shrub
SC	Blueblossom Ceanothus	Chaparral/serotinous conifers	UL	Catclaw Acacia	Desert mixed shrub
SQ	Soft Scrub Mixed Chaparral	Chaparral/serotinous conifers			

Table 2 (cont.)

CALVEG Code	CALVEG Type	PFR ("Presettlement Fire Regime")	CALVEG Code	CALVEG Type	PFR ("Presettlement Fire Regime")
UP	Palo Verde	Desert mixed shrub	MU	Ultramafic Mixed Conifer	Moist mixed conifer
UX	Smoke Tree	Desert mixed shrub	PE	Sugar Pine	Moist mixed conifer
BG	Greasewood	Desert mixed shrub	WD	Dogwood	Moist mixed conifer
DS	Shadscale	Desert mixed shrub	CI	Deerbrush	Montane chaparral
FD	Ephedra	Desert mixed shrub	CG	Greenleaf Manzanita	Montane chaparral
NA	Alkaline Mixed Scrub	Desert mixed shrub	CH	Huckleberry Oak	Montane chaparral
BC	Saltbush	Desert mixed shrub	CN	Pinemat Manzanita	Montane chaparral
DJ	Spiny Menodora	Desert mixed shrub	CP	Bush Chinquapin	Montane chaparral
UD	Desert Willow	Desert mixed shrub			
DD	Croton	Desert mixed shrub	CV	Snowbrush	Montane chaparral
LS	Scalebroom	Desert mixed shrub	CX	Upper Montane Mixed Chaparral	Montane chaparral
TM	Horsebrush	Desert mixed shrub	CY	Mountain Whitethorn	Montane chaparral
UM	Mesquite	Desert mixed shrub	CM	Upper Montane Mixed Shrub	Montane chaparral
MP	Mixed Conifer - Pine	Dry mixed conifer	QD	Blue Oak	Oak woodland
PW	Ponderosa Pine - White Fir	Dry mixed conifer	PD	Gray Pine	Oak woodland
AB	Santa Lucia Fir	Fire sensitive spruce or fir	QG	Oregon White Oak	Oak woodland
EA	Engelmann Spruce	Fire sensitive spruce or fir	QL	Valley Oak	Oak woodland
PB	Brewer Spruce	Fire sensitive spruce or fir	QN	Engelmann Oak	Oak woodland
LP	Lodgepole Pine	Lodgepole pine	CJ	Brewer Oak	Oak woodland
EX	Coastal Mixed Hardwood	Mixed evergreen	WJ	Western Juniper	Pinyon juniper
QA	Coast Live Oak	Mixed evergreen	PJ	Singleleaf Pinyon Pine	Pinyon juniper
QB	California Bay	Mixed evergreen	PQ	Fourneedle Pinyon Pine	Pinyon juniper
QH	Madrone	Mixed evergreen	JU	Utah Juniper	Pinyon juniper
QM	Bigleaf Maple	Mixed evergreen	BI	Littleleaf Mountain Mahogany	Pinyon juniper
QT	Tanoak (Madrone)	Mixed evergreen	PO	Port Orford Cedar	Port Orford cedar
TX	Montane Mixed Hardwood	Mixed evergreen	RF	Red Fir	Red fir
QC	Canyon Live Oak	Mixed evergreen	WW	Western White Pine	Western white pine
DF	Pacific Douglas-Fir	Mixed evergreen	RD	Redwood - Douglas-Fir	Redwood
CB	Salal - California Huckleberry	Mixed evergreen	RW	Redwood	Redwood
TC	Tree Chinquapin	Mixed evergreen	CT	Tucker / Muller Scrub Oak	Semi-desert chaparral
AS	Shreve Oak	Mixed evergreen	CZ	Semi-Desert Chaparral	Semi-desert chaparral
QI	California Buckeye	Mixed evergreen	PS	Shore Pine	Shore pine
QV	California Walnut	Mixed evergreen	TU	Silver Sagebrush	Silver sagebrush
QW	Interior Live Oak	Mixed evergreen	SR	Sitka Spruce - Redwood	Spruce-hemlock
NX	Interior Mixed Hardwood	Mixed evergreen	SK	Sitka Spruce	Spruce-hemlock
BT	Big Tree (Giant Sequoia)	Moist mixed conifer	SG	Sitka Spruce - Grand Fir	Spruce-hemlock
DP	Douglas-Fir - Ponderosa Pine	Moist mixed conifer	SA	Subalpine Conifers	Subalpine forest
DW	Douglas-Fir - White Fir	Moist mixed conifer	MH	Mountain Hemlock	Subalpine forest
MB	Mixed Conifer - Giant Sequoia	Moist mixed conifer	WB	Whitebark Pine	Subalpine forest
MF	Mixed Conifer - Fir	Moist mixed conifer	BP	Bristlecone Pine	Subalpine forest
MK	Klamath Mixed Conifer	Moist mixed conifer	FP	Foxtail Pine	Subalpine forest
WF	White Fir	Moist mixed conifer	AX	Alpine Mixed Scrub	Subalpine forest
MD	Incense Cedar	Moist mixed conifer	PL	Limber Pine	Subalpine forest

Table 2 (cont.)

CALVEG Code	CALVEG Type	PFR ("Presettlement Fire Regime")	CALVEG Code	CALVEG Type	PFR ("Presettlement Fire Regime")
EP	Eastside Pine	Yellow pine	SO	Coastal Cactus	none
JP	Jeffrey Pine	Yellow pine	UB	Urban/Developed (General)	none
PP	Ponderosa Pine	Yellow pine	UW	Fan Palm	none
QK	Black Oak	Yellow pine	W1	River/Stream/Canal	none
WP	Washoe Pine	Yellow pine	W2	Perennial Lake or Pond	none
CE	Mountain Misery	Yellow pine	W3	Reservoir	none
JJ	Yellow Pine - Western Juniper	Yellow pine	W4	Bay or Estuary	none
DE	Arrowweed	none	W5	Playa	none
A1	Conifer Agriculture (Xmas Trees)	none	W6	Intermittent Stream Channel	none
A2	Vineyard - Shrub Agriculture	none	W7	Ocean	none
A3	Tilled Earth	none	W8	Intermittent Lake or Pond	none
A4	Orchard Agriculture	none	W9	High Water Line/Gravel/Sand Bar	none
A5	Flooded Row Crop Agriculture	none	WA	Water (General)	none
A6	Pastures and Crop Agriculture	none	AC	Alpine Grasses and Forbs	none
A7	Feature	none	NM	Riparian Mixed Shrub	none
A8	Nurseries	none	TA	Mountain Alder	none
AG	Agriculture (General)	none	WL	Willow (Shrub)	none
AK	Alkaline Flats	none	DU	Dune	none
BA	Barren	none	FO	Water Birch	none
HA	Alkaline Mixed Grasses	none	HC	Pickleweed - Cordgrass	none
HG	Annual Grasses and Forbs	none	QY	Willow - Alder	none
HJ	Wet Meadows	none	QZ	Eucalyptus	none
HM	Perennial Grasses and Forbs	none	RS	Riversidean Alluvial Scrub	none
HT	Tule - Cattail	none	VP	Vernal Pool	none
IA	Non-Native/Invasive Grass	none	OS	Beach Sand	none
IB	Urban-related Bare Soil	none	UT	Tamarisk	none
IC	Non-Native/Ornamental Conifer	none	NR	Riparian Mixed Hardwood	none
IF	Non-Native/Invasive Forb	none	QE	White Alder	none
IG	Non-Native/Ornamental Grass	none	QF	Fremont Cottonwood	none
IH	Non-Native/Ornamental Hardwood	none	QJ	Cottonwood - Alder	none
IM	Non-Native/Ornamental Conifer/Hardwood	none	QO	Willow	none
IS	Non-Native/Ornamental Shrub	none	QX	Black Cottonwood	none
IW	Urban or Industrial Impoundment	none	QP	California Sycamore	none
SL	Coastal Lupine	none	QR	Red Alder	none
SN	Snow/Ice	none	ML	Baccharis (Riparian)	none

FireRegimeGrp: “Fire Regime Group”. This field assigns the standard National Fire Plan Fire Regime Group to each PFR. The Fire Regime Group combines fire frequency and fire severity, and pertains to the action of fire in the PFR before Euroamerican settlement. See Table 4.

Table 3. Fire regime groups.

Fire Regime Group	Fire frequency	Fire severity
I	0-35 years	Low (surface fires) to mixed (<75% of dominant overstory vegetation replaced by fire)
II	0-35 years	High (>75% of dominant overstory vegetation replaced by fire)
III	35-100 years	Mixed
IV	35-100 years	High
V	100+ years	High

CurrentFRI: The current fire return interval is calculated by dividing the number of years in the fire record (e.g., 2010-1908=103 years inclusive) by the number of fires occurring between 1908 and the current year in a given polygon plus one (CurrentFRI = Number of years/Number of fires +1). Although fires prior to 1908 are recorded in the fire perimeter database, they are not included in this analysis due to lack of consistency in reporting (1908 is the year that the US Forest Service began to formally record information on size and location of major fires). CurrentFRI is derived by overlaying the fire perimeters on the PFR polygons and summing the number of fires affecting each polygon after 1908.

MeanRefFRI: The mean reference fire return interval is an approximation of how often, on average, a given PFR likely burned in the three or four centuries prior to significant Euroamerican settlement (i.e., before the middle of the 19^{th} century; Table 4). MeanRefFRI values are averages of mean FRI values taken from an exhaustive review of the published and unpublished literature pertaining to pre-Euroamerican settlement fire occurrence (Table 4). Most mean FRI values used in this analysis are derived from small-scale (<4 ha) composite fire histories including records from multiple trees in a defined area. Composite FRIs represent the fire history of a given area better than point FRIs (derived from a single tree) because some fire events fail to scar every recording tree within the fire perimeter, especially in regimes characterized by frequent low intensity fire (Collins and Stephens, 2007). Furthermore, composite FRIs are more sensitive and better suited to analyzing changes in fire occurrence than point FRIs (Dieterich, 1980). While there is some variability introduced by using composite FRIs from different sized areas, they are less likely to underestimate pre-Euroamerican settlement mean FRI values than point FRIs. Some PFRs, such as Yellow Pine and Dry Mixed Conifer, burned very frequently (mean FRIs of 11-12 years), while others such as Spruce-Hemlock and Desert Mixed Shrub burned very infrequently (mean FRIs of 275-636 years). A high degree of confidence can be placed in the validity of the FRI values of most conifer PFRs, especially in the Sierra Nevada, due to the abundance of published dendrochronological studies. Less confidence is afforded to the FRI values of PFRs in which pre-Euroamerican fire history is less well-studied, such as California Juniper, Desert Mixed Shrub, Semi-Desert Chaparral, and Silver Sagebrush. For shrub-dominated PFRs in which pre-settlement fires are difficult to detect due to lack of dendrochronological evidence, FRI values were derived from other types of data, such as charcoal in sediment cores, and expert quantitative estimates. Ignitions by indigenous peoples were likely a large component of the pre-Euroamerican settlement fire record in some PFRs, such as Redwood and Oak Woodland, and are difficult or impossible to differentiate from lightning ignitions (Anderson and Moratto, 1996). Some vegetation types in certain areas were probably maintained mostly by pre-Euroamerican anthropogenic fire regimes, which may have resulted in vegetation type conversions in some parts of the landscape prior to Euroamerican arrival. Widespread indigenous ignitions were probably uncommon in other PFRs, however, such as Subalpine Forest and Lodgepole Pine. Regardless, no attempt is made in this analysis to differentiate between lightning and indigenous ignitions. The final FRI values used in this analysis, and the sources from which they were derived, are presented in Table 4.

MedianRefFRI: The median reference fire return interval is an approximation of the center of pre-Euroamerican FRI distributions (Table 4). Because FRI distributions are often skewed (with more short or long intervals, depending on the PFR), median FRI values may be a better approximation of how often a given PFR likely burned prior to Euroamerican settlement than mean FRIs. MedianRefFRI values are averages of median FRIs taken from an exhaustive review of the published and unpublished literature pertaining to pre-Euroamerican settlement fire occurrence. Most median FRI values used in this analysis are derived from small-scale (<4 ha) composite fire histories including records from multiple trees in a defined area. In a few cases, explicit information on median FRIs was not available ("NA" in Table 4); in these cases we used the mean FRI for analysis.

MinRefFRI: This is the mean of the minimum reference FRIs reported in the literature. The minimum reference fire return interval is an approximation of the minimum number of years between fires in a given PFR prior to Euroamerican settlement (Table 4). An estimate of the lower bound of the FRI distribution facilitates better characterization of variability in pre-settlement fire regimes than measures of central tendency alone (i.e. mean or median). This allows managers to determine whether a given area is approaching or exceeding the historic range of variation in FRI. MinRefFRI values are averages of minimum FRIs taken from an exhaustive review of the published and unpublished literature pertaining to pre-Euroamerican settlement fire occurrence. Thus, the minimum values described in this assessment are not absolute minimums, but typical minimum values that would be expected across the geographical range of the PFR. Most minimum FRI values used in this analysis are derived from small-scale (<4 ha) composite fire histories including records from multiple trees in a defined area.

MaxRefFRI: This is the mean of the maximum reference FRIs reported in the literature. The maximum reference fire return interval is an approximation of the maximum number of years between fires in a given PFR prior to Euroamerican settlement (Table 4). An estimate of the upper bound of the FRI distribution facilitates better characterization of variability in pre-settlement fire regimes than measures of central tendency alone (i.e. mean or median). This allows managers to determine whether a given area is approaching or exceeding the historic range of variation in FRI. MaxRefFRI values derive from an exhaustive review of the published and unpublished literature pertaining to pre-Euroamerican settlement fire occurrence. Thus, the maximum values described in this assessment are not absolute maximums, but typical maximum values that would be expected across the geo-graphical range of the PFR. Most maximum FRI values used in this analysis are derived from small-scale (<4 ha) composite fire histories including records from multiple trees in a defined area.

Table 4. Reference fire return intervals (FRIs) of Pre-Euroamerican settlement Fire Regimes (PFRs) considered in this analysis and sources (citations on following pages). Min/Max are rounded to the nearest multiple of 5.

Pre-settlement Fire Regime (PFR)	Mean	Median	Mean Min	Mean Max	Sources
Aspen	19	20	10	90	1-7
Big sagebrush	35	41	15	85	2, 4, 7-22
Bigcone Douglas-fir	31	30	5	95	2, 23-26
Black and Low sagebrush	66	53	35	115	2, 4, 12, 13, 21, 22, 27-31
California juniper	83	77	5	335	2, 13, 15, 18, 32
Chaparral and serotinous conifers	55	59	30	90	2, 33-72
Coastal fir	99	NA	90	435	73-84
Coastal sage scrub	76	100	20	120	2, 25, 44, 47, 48, 71, 85-94
Curl-leaf mountain mahogany	52	62	30	130	2, 4, 7, 14, 16, 18, 22, 95-98
Desert mixed shrub	610	610	120	1440	2, 99-108
Dry mixed conifer	11	9	5	50	3, 6, 24, 68, 70, 71, 109-140
Fire sensitive spruce or fir	93	61	50	180	2, 22, 44, 141-157
Lodgepole pine	37	36	15	290	2, 3, 5, 6, 21, 68, 70, 112, 125, 127, 132, 158-172
Mixed evergreen	29	13	15	80	2, 23, 44, 74, 82, 127, 173-187
Moist mixed conifer	16	12	5	80	2, 3, 6, 68, 70, 71, 98, 110-113, 116, 117, 119, 121-123, 125, 127-130, 132, 133, 136, 145, 147, 164, 168, 170, 183, 187-209
Montane chaparral	27	24	15	50	2, 33, 58, 68, 209-211
Oak woodland	12	12	5	45	2, 44, 68, 127, 186, 212-225
Pinyon-juniper	151	94	50	250	2, 14, 16, 22, 71, 89, 226-233
Port Orford cedar	30	16	10	160	2, 98, 144, 147, 168, 173, 177, 187, 188, 205, 234-237
Red fir	40	33	15	130	2, 3, 6, 68, 110, 112, 119, 127, 132, 134, 162, 164, 168-170, 172, 181, 187, 238-248
Redwood	23	15	10	170	2, 44, 74, 82, 174, 178, 179, 182, 186, 249-257
Semi-desert chaparral	65	65	50	115	2, 258-261
Shore pine	250	NA	190	1025	78, 262, 277
Silver sagebrush	35	31	15	65	2, 10, 58, 263, 264
Spruce-hemlock	275	NA	180	550	75, 77, 80, 265-269
Subalpine forest	133	132	100	420	2, 68, 98, 112, 143, 164, 165, 168, 172, 187, 199, 270-272
Western white pine	50	42	15	370	2, 6, 98, 112, 119, 127, 134, 147, 164, 166, 168-170, 172, 199, 245, 257, 273

Yellow pine	11	7	5	40	2, 3, 14, 21, 68, 70, 71, 113, 116, 117, 119, 127, 131, 132, 134, 165, 169, 189, 200, 224, 263, 274-276

1 Richardson and Provencher, 2005
2 Sawyer et al., 2009
3 Van de Water and North, 2010
4 Wall et al., 2001
5 Riegel et al., 2006
6 Beaty and Taylor, 2008
7 Miller et al., 2001
8 Major et al., 2005
9 Zielinski and Provencher, 2005
10 Medlyn and Kolden, 2005
11 Winward, 1991
12 Miller and Rose, 1999
13 Young and Evans, 1981
14 Gruell, 1999
15 Martin and Johnson, 1979
16 Gruell et al., 1994
17 Mensing et al., 2006
18 Miller and Heyerdahl, 2008
19 Sapsis, 1990
20 Bork, 1984
21 Norman and Taylor, 2005
22 Kitchen, 2010
23 Sugihara and Borgias, 2005
24 Safford and Keeler-Wolf, 2005
25 Byrne, 1978
26 Lombardo et al., 2009
27 Kolden and Medlyn, 2005
28 Burkhardt and Tisdale, 1976
29 Kitchen and McArthur, 2007
30 Knick et al., 2005
31 Loope and Gruell, 1973
32 Reeberg and Weisberg, 2006
33 Sugihara et al., 2004
34 Foster, 2006a
35 Syphard and Foster, 2006
36 Beyers and Parker, 2006
37 Keeler-Wolf et al., 2005
38 Syphard and Beyers, 2006
39 Minnich, 2006
40 Ne'eman et al., 1999
41 Vogl, 1973
42 Conard and Weise, 1998
43 Minnich, 1989
44 Greenlee and Langenheim, 1990
45 Keeley and Fotheringham, 2001
46 Borchert, 2008
47 Byrne et al., 1977
48 Mensing et al., 1999
49 Minnich and Chou, 1997
50 Minnich, 2001
51 Moritz et al., 2004
52 Moritz, 2003
53 Zedler, 1995
54 De Gouvenain and Ansary, 2006
55 Wells et al., 2003
56 Mallek, 2009
57 Stephens et al., 2004
58 Wright and Bailey, 1982
59 Keeley, 1982
60 Walter and Taha, 1999
61 Wells and Getis, 1999
62 Borchert and Foster, 2006
63 Vogl et al., 1977
64 Keeley, 1981
65 Florence, 1987
66 Davis and Borchert, 2006
67 Jackson, 1977
68 Caprio and Lineback, 2002
69 Zedler, 1981
70 Minnich et al., 2000
71 Stephenson and Calcarone, 1999
72 Shlisky and Reeberg, 2008
73 Kertis et al., 2005
74 Finney and Martin, 1989
75 Long and Whitlock, 2002
76 Veirs, 1980
77 Long et al., 2007
78 Brown and Hebda, 2002
79 Long et al., 2010
80 Long et al., 1998
81 McCoy, 2006
82 Stuart, 1987
83 Agee et al., 1984
84 Walsh et al., 2008
85 Taylor, 2006
86 Keeler-Wolf and Foster, 2006
87 Hanes, 1971
88 Westman, 1982
89 Paysen et al., 2000.
90 O'Leary, 1990

91 Vogl, 1976
92 Russell, 1983
93 Talluto and Suding, 2008
94 Keeley et al., 2005
95 Ross et al., 2005
96 Arno and Wilson, 1983
97 Erhard, 2008
98 Minckley et al., 2007
99 Dingman and Esque, 2005
100 Novak-Echenique, 2005a
101 Novak-Echenique, 2005b
102 Alford and Ambos, 2005
103 Esque and McPherson, 2005
104 Nachlinger, 2005
105 Thomas, 1991
106 Wright, 1986
107 Brooks and Matchett, 2006
108 Brown and Minnich, 1986
109 Arabas et al., 2006
110 Beaty and Taylor, 2001
111 Beaty and Taylor, 2009
112 Bekker and Taylor, 2001
113 Caprio and Swetnam, 1995
114 Everett, 2008
115 Evett et al., 2007
116 Fry and Stephens, 2006
117 Gill and Taylor, 2009
118 Keeler-Wolf, 1991
119 Beaty and Taylor, 2007
120 Hemstrom et al., 2008a
121 Wagener, 1961
122 Kotok, 1930
123 Show and Kotok, 1924
124 Warner, 1980
125 Caprio, 2004c
126 Skinner et al., 2008
127 Skinner and Chang, 1996
128 Skinner et al., 2006
129 Skinner et al., 2009
130 Stephens and Collins, 2004
131 Stephens et al., 2003
132 Swetnam et al., 2001
133 Swetnam et al., 2009
134 Taylor, 2000
135 Taylor, 2004
136 Taylor and Skinner, 2003
137 Trouet et al., 2010
138 Vaillant and Stephens, 2009
139 Sherlock and Sugihara, 2008
140 Gassaway, 2005
141 Powell and Swanson, 2005
142 Simpson et al., 2005
143 Swanson, 2005
144 Borgias et al., 2005
145 Talley and Griffin, 1980
146 Briles et al., 2005
147 Briles et al., 2008
148 Grissino-Mayer et al., 1996
149 Touchan et al., 1996
150 Wadleigh and Jenkins, 1996
151 White and Vankat, 1993
152 Hemstrom et al., 2008b
153 Toney and Anderson, 2006
154 Fule et al., 2003
155 Schellhaas et al., 2001
156 Anderson et al., 2008
157 Allen et al., 2008
158 Caprio, 2004a
159 Caprio, 2004b
160 Keifer, 1991
161 Caprio, 2002
162 Van Wagtendonk, 1995
163 Brunelle and Anderson, 2003
164 Daniels et al., 2005
165 North et al., 2009
166 Pitcher, 1987
167 Sheppard and Lassoie, 1998
168 Skinner, 2003
169 Stephens, 2001
170 Taylor and Solem, 2001
171 Caprio, 2008
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173 Sugihara et al., 2005
174 Veirs, 1982
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178 Brown et al., 1999
179 Greenlee, 1983
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195 Fiegener, 2002
196 Sherlock et al., 2008
197 Kilgore, 1973
198 Swetnam et al., 1990
199 Mohr et al., 2000
200 Moody et al., 2006
201 Drumm, 1996
202 North et al., 2005
203 Phillips, 2002
204 Scholl and Taylor, 2010
205 Skinner, 2002
206 Swetnam, 1993
207 Taylor and Skinner, 1998
208 Stuart and Salazar, 2000
209 Nagel and Taylor, 2005
210 Wilken, 1967
211 Botti, 1979
212 Wills et al., 2005
213 Reilly et al., 2004
214 Evans et al., 2005
215 Klein and Evens, 2007
216 Davis, 2006
217 Evens and Klein, 2006a
218 Evens and Klein, 2006b
219 Mensing, 1992
220 Sugihara and Reed, 1987
221 Anderson and Moratto, 1996
222 McClaran, 1988
223 Purcell and Stephens, 1997
224 Stephens, 1997
225 Agee and Biswell, 1978
226 Weisberg, 2005
227 Arno, 1985
228 Gruell, 1997
229 Bauer, 2006
230 Bauer and Weisberg, 2009
231 Jamieson, 2008
232 Romme et al., 2009
233 Wangler and Minnich, 1996
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237 Scher and Jimerson, 1989
238 Atzet and White, 2005
239 Safford and Sherlock, 2005a
240 Safford and Sherlock, 2005b
241 Barbour and Minnich, 2000
242 Chappell and Agee, 1996
243 Bancroft, 1979
244 Atzet and McCrimmon, 1990
245 Scholl and Taylor, 2006
246 Foster, 1998
247 Taylor, 1993
248 Taylor and Halpern, 1991
249 Sugihara et al., 2005
250 Huff et al., 2005
251 Brown and Baxter, 2003
252 Swetnam, 1994
253 Fritz, 1931
254 Hunter and Parker, 1993
255 Jacobs et al., 1985
256 Norman, 2007
257 Brown and Smith, 2000
258 Provencher et al., 2005
259 Brooks, 2005
260 Cable, 1975
261 Brooks et al., 2007
262 Parminter, 1991
263 Norman and Taylor, 2003
264 Quinnild and Cosby, 1958
265 Acker et al., 2004
266 Whitlock et al., 2008
267 Teensma et al., 1991
268 Impara, 1997
269 Agee, 1993
270 Van Wagtendonk et al., 2005
271 Richardson and Howell, 2005
272 Short et al., 2005
273 Foster, 2006b
274 Safford et al., 2005
275 McBride and Laven, 1976
276 Taylor and Beaty, 2005
277 Cope, 1993

MeanFreqDep: This is a measure of the extent to which contemporary fires (i.e. since 1908) are burning at frequencies similar to the frequencies that occurred prior to Euroamerican settlement, with the mean reference FRI as the basis for comparison. MeanFreqDep is a metric of fire return interval departure (FRID), and measures the departure of current FRI from reference mean FRI in percent. This measure does not return to zero when a fire occurs, unlike FRID values used in some other analyses (van Wagtendonk et al., 2002). Instead, the following formulas are used to calculate FRID: [1-(MeanRefFRI/CurrentFRI)]*100 when current FRI is longer than reference FRI (the common condition in most coniferous PFRs), and –{[1-(CurrentFRI/MeanRefFRI)]}*100 when current FRI is shorter than reference FRI (common in some shrub-dominated PFRs, and areas in the Wildland Urban Interface). For areas dominated by PFRs with a mean reference FRI greater than 103 years, and that have not burned in the period of historical record considered in this analysis (i.e. since 1908), the FRID is assumed to equal zero.

MedianFreqDep: This is a measure of the extent to which contemporary fires (i.e. since 1908) are burning at frequencies similar to the frequencies that occurred prior to Euroamerican settlement, with the median reference FRI as the basis for comparison. MedianFreqDep is a metric of fire return interval departure (FRID), and measures the departure of current FRI from reference median FRI in percent. This measure does not return to zero when a fire occurs, unlike FRID values used in some other analyses (van Wagtendonk et al., 2002). Instead, the following formulas are used to calculate FRID: [1-(MedianRefFRI/CurrentFRI)]*100 when current FRI is longer than reference FRI (the common condition in most coniferous PFRs), and {–[1-(CurrentFRI/MedianRefFRI)]}*100 when current FRI is shorter than reference FRI (common in some shrub-dominated PFRs, and areas in the Wildland Urban Interface). For areas dominated by PFRs with a median reference FRI greater than 103 years, and that have not burned in the period of historical record considered in this analysis (i.e. since 1908), the FRID is assumed to equal zero. In a few cases, explicit information on median FRIs was not available ("NA" in Table 4); in these cases we used the mean FRI for analysis.

MinFreqDep: This is a measure of the extent to which contemporary fires (i.e. since 1908) are burning at frequencies similar to the frequencies that occurred prior to Euroamerican settlement, with the mean minimum reference FRI as the basis for comparison. MinFreqDep is a metric of fire return interval departure (FRID), and measures the departure of current FRI from reference mean minimum FRI in percent. This measure does not return to zero when a fire occurs, unlike FRID values used in some other analyses (van Wagtendonk et al., 2002). Instead, the following formulas are used to calculate FRID: [1-(MinRefFRI/CurrentFRI)]*100 when current FRI is longer than reference FRI (the common condition in most coniferous PFRs), and {–[1-(CurrentFRI/MinRefFRI)]}*100 when current FRI is shorter than reference FRI (common in some shrub-dominated PFRs, and areas in the Wildland Urban Interface). For areas dominated by PFRs with a minimum reference FRI greater than 103 years, and that have not burned in the period of historical record considered in this analysis (i.e. since 1908), the FRID is assumed to equal zero.

MaxFreqDep: This is a measure of the extent to which contemporary fires (i.e. since 1908) are burning at frequencies similar to the frequencies that occurred prior to Euroamerican settlement, with the mean maximum reference FRI as the basis for comparison. MaxFreqDep is a metric of fire return interval departure (FRID), and measures the departure of current FRI from reference mean maximum FRI in percent. This measure does not return to zero when a fire occurs, unlike FRID values used in some other analyses (van Wagtendonk et al., 2002). Instead, the following formulas are used to calculate FRID: [1-(MaxRefFRI/CurrentFRI)]*100 when current FRI is longer than reference FRI (the common condition in most coniferous PFRs), and {–[1-(CurrentFRI/MaxRefFRI)]}*100 when current FRI is shorter than reference FRI (common in some shrub-dominated PFRs, and areas in the Wildland Urban Interface). For areas dominated by PFRs with a maximum reference FRI greater than 103 years, and that have not burned in the period of historical record considered in this analysis (i.e. since 1908), the FRID is assumed to equal zero.

MeanCC_FRI: This is a condition class categorization of the data in the MeanFreqDep field. MeanCC_FRI categorizes the percent differences calculated in MeanFreqDep using the following scale: 0 to 33% departure = CC1, 33 to 67% departure = CC2, and >66% departure = CC3. Negative condition classes (i.e. where fires are burning more often that under pre-settlement conditions) are categorized on the negative of the same scale: 0 to -33% = CC-1, -33 to -67% = CC-2, <-67% = CC-3. CC1 and CC-1 are mapped in the same class because they are both within 33% of the mean pre-settlement value.

MedianCC_FRI: This is a condition class categorization of the data in the MedianFreqDep field. MedianCC_FRI categorizes the percent differences calculated in MedianFreqDep using the following scale: 0 to 33% departure = CC1, 33 to 67% departure = CC2, and >66% departure = CC3. Negative condition classes (i.e. where fires are burning more often that under pre-settlement conditions) are categorized on the negative of the same scale: 0 to -33% = CC-1, -33 to -67% = CC-2, <-67% = CC-3. CC1 and CC-1 are mapped in the same class because they are both within 33% of the median pre-settlement value.

MinCC_FRI: This is a condition class categorization of the data in the MinFreqDep field. MinCC_FRI categorizes the percent differences calculated in MinFreqDep using the following scale: 0 to 33% departure = CC1, 33 to 67% departure = CC2, and >66% departure = CC3. Negative condition classes (i.e. where fires are burning more often that under pre-settlement conditions) are categorized on the negative of the same scale: 0 to -33% = CC-1, -33 to -67% = CC-2, <-67% = CC-3. CC1 and CC-1 are mapped in the same class because they are both within 33% of the mean pre-settlement value. This metric allows managers to make defensible determinations of areas of significant frequency departures (i.e. current vs. pre-settlement). Areas where MinFreqDep and MinCC_FRI are very low (i.e. very negative) are locations where fire currently occurs much more frequently than it did prior to Euroamerican settlement, and the current FRI is likely below the historic range of variation.

MaxCC_FRI: This is a condition class categorization of the data in the MaxFreqDep field. MaxCC_FRI categorizes the percent differences calculated in MaxFreqDep using the following scale: 0 to 33% departure = CC1, 33 to 67% departure = CC2, and >66% departure = CC3. Negative condition classes (i.e. where fires are burning more often that under pre-settlement conditions) are categorized on the negative of the same scale: 0 to -33% = CC-1, -33 to -67% = CC-2, <-67% = CC-3. CC1 and CC-1 are mapped in the same class because they are both within 33% of the mean pre-settlement value. This metric allows managers to make defensible determinations of areas of significant frequency departures (i.e. current vs. pre-settlement). Areas where MaxFreqDep and MaxCC_FRI are very high are locations where fire currently occurs much less frequently than it did prior to Euroamerican settlement, and the current FRI is likely above the historic range of variation.

NPS_FRID: This FRID measure was developed by the National Park Service for the southern Sierra Nevada (Caprio et al. 1997). It is based on this formula: FRID = [(MaxRefFRI – TSLF)/MaxRefFRI]. This measure differs from the FreqDep and CC_FRI measures in that it does not consider the cumulative fire history of the polygon since 1908, but only the time since last fire (TSLF).

NPS_FRID_Index: This is an index of fire frequency departure derived from NPS_FRID. Values of NPS_FRID ≤-5 are “extreme”; values between -5 and -2 are “high”; values between -2 and 0 are “moderate”; values >0 are “low”.

NPS_MeanFRID: This is the NPS_FRID measure calculated using the MeanRefFRI instead of the MaxRefFRI.

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