Supplemental Materials

Figures

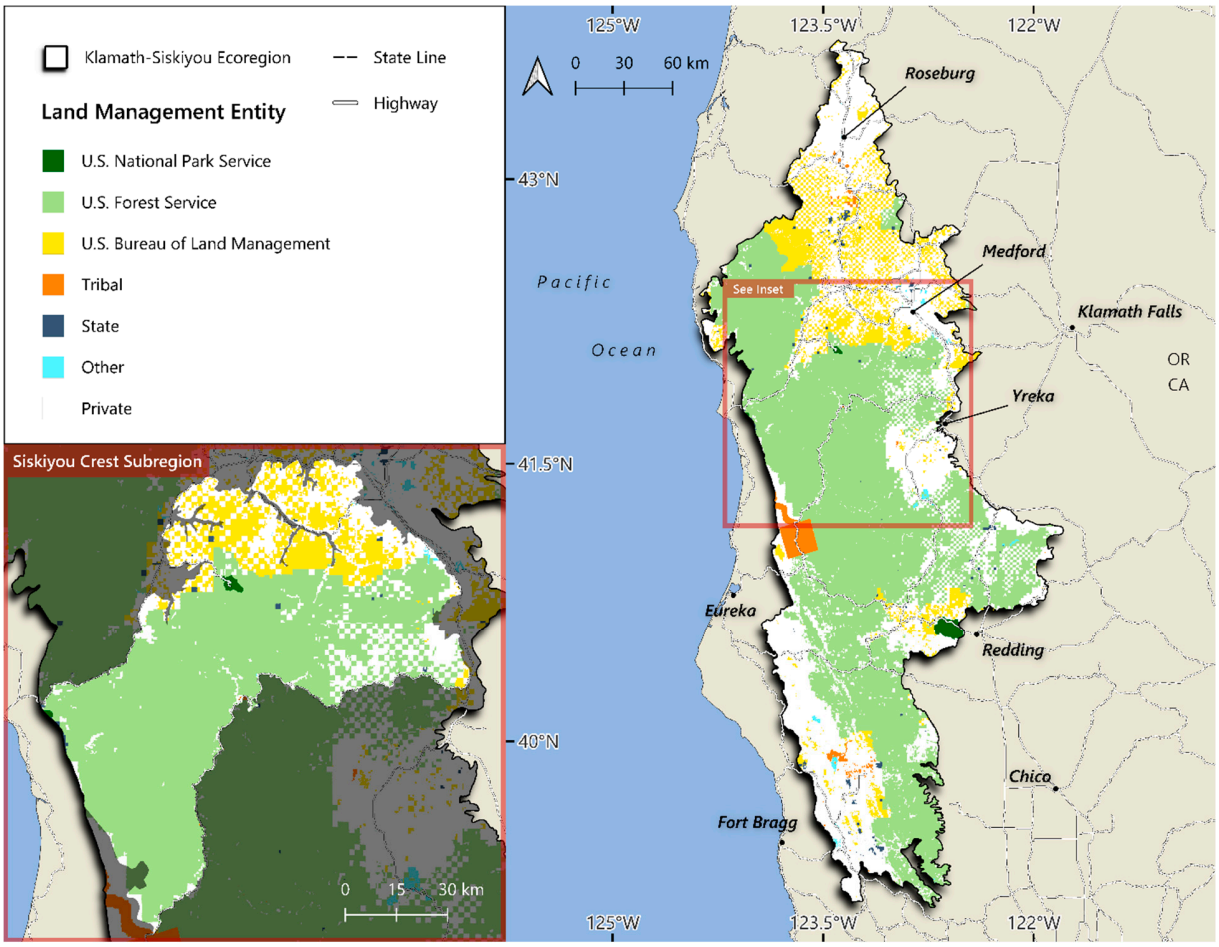

Figure S1. Land ownership/management entity of the KSE and SCS. Note that "Other" includes the following: U.S. Bureau of Reclamation, city, county, district, and non-governmental organization.

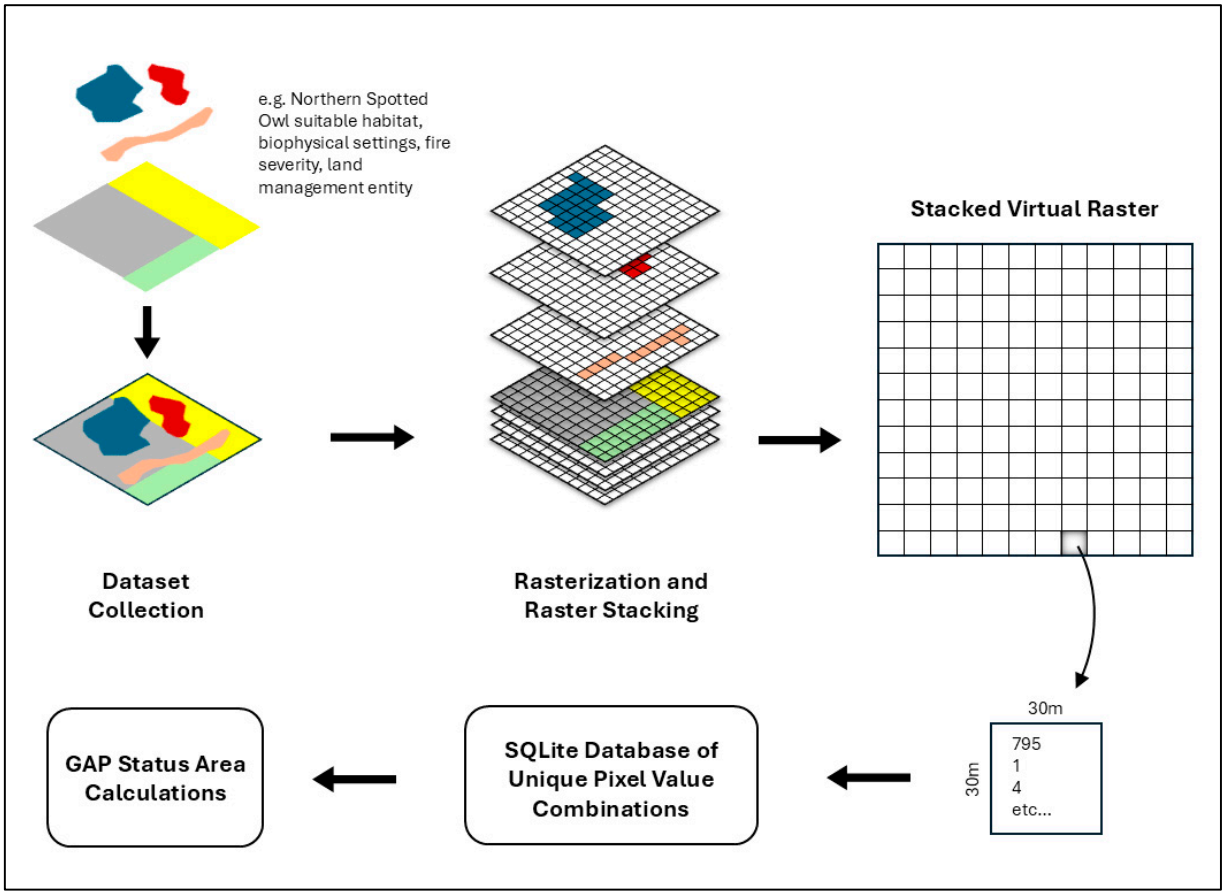

Figure S2. The data collection and processing workflow for all analyses except those related to fuels and WUI as well as climate change.

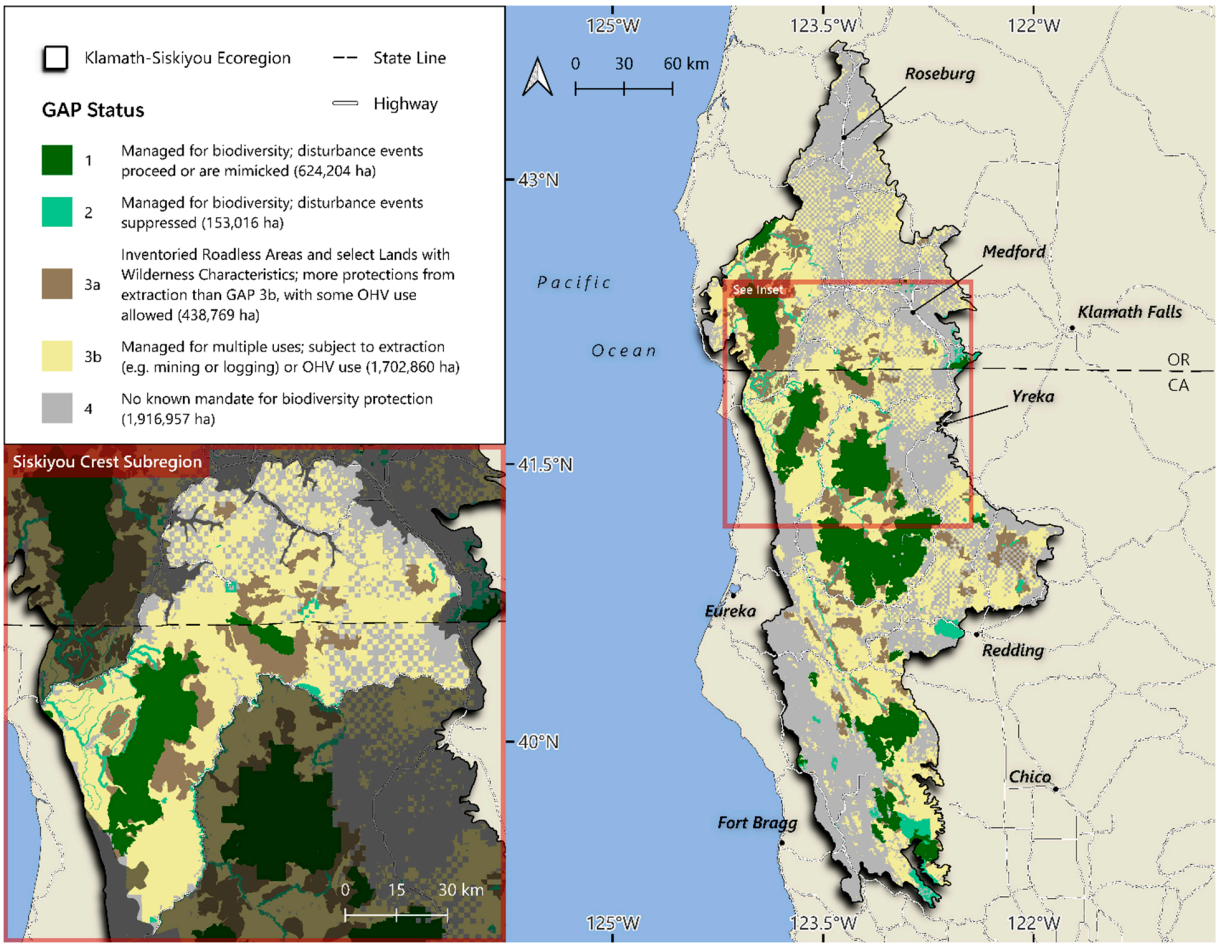

Figure S3. GAP status distribution across the KSE and SCS.

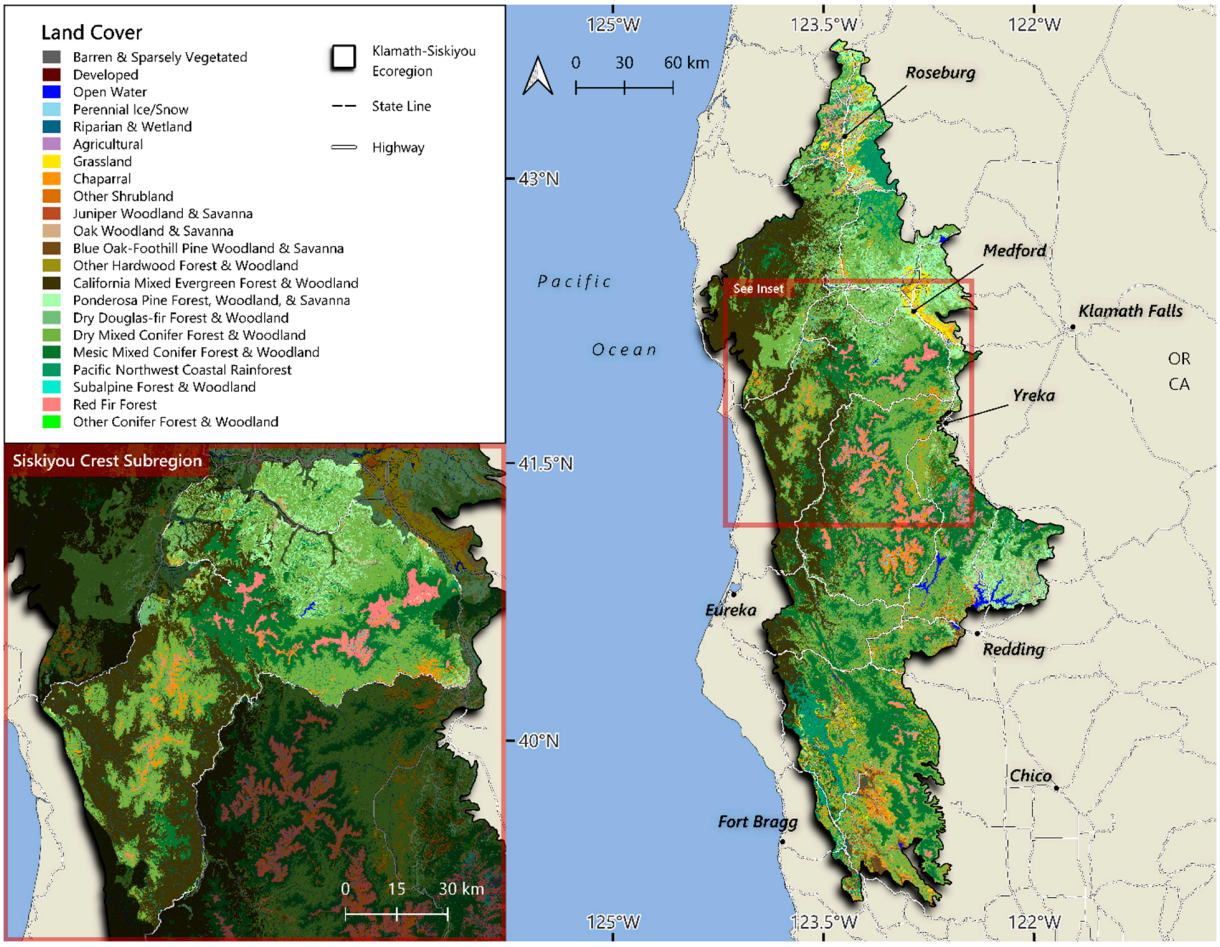

Figure S4. Land cover (LANDFIRE BPS modified with agricultural and developed types from LANDFIRE EVT) distribution across the KSE and SCS.

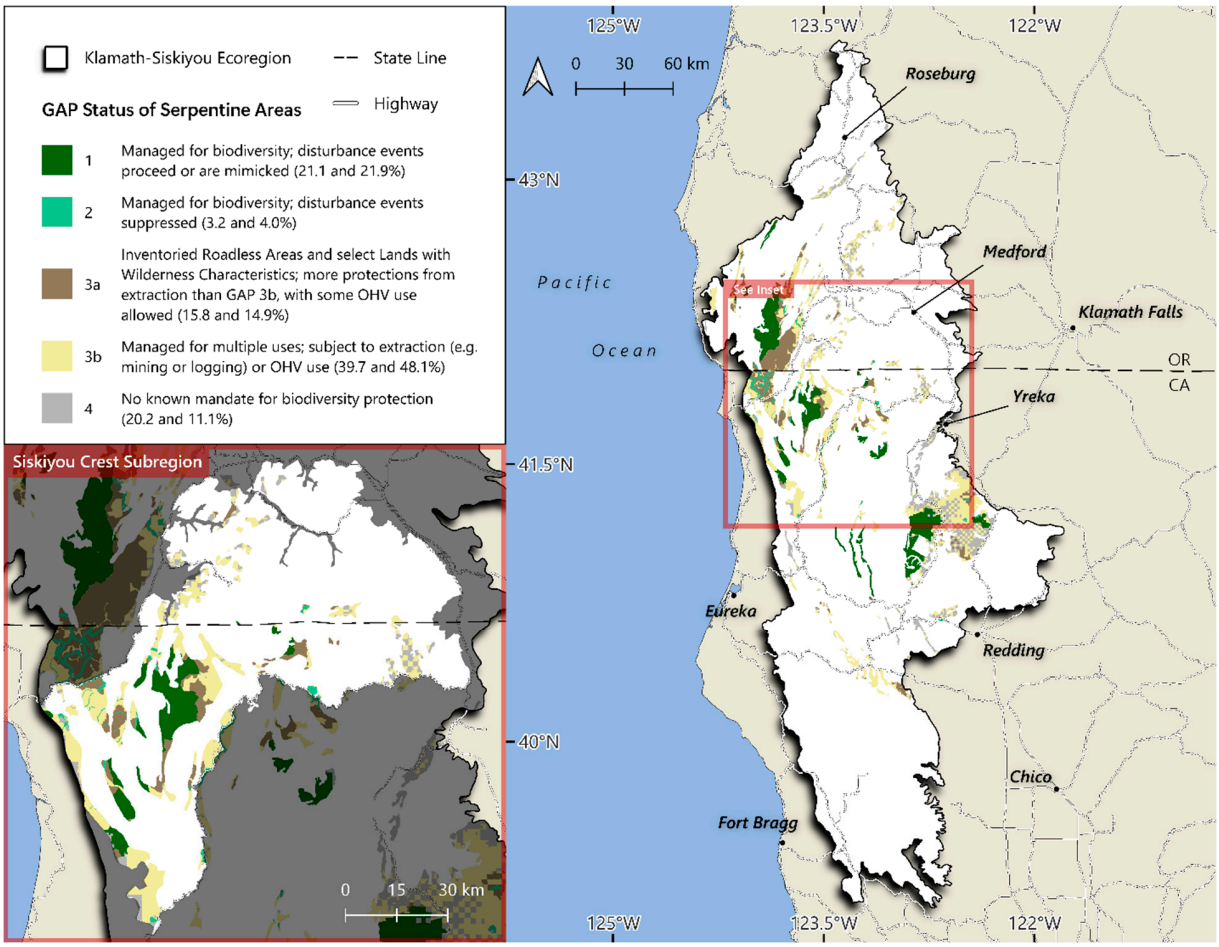

Figure S5. GAP status distribution across serpentine areas within the KSE and SCS.

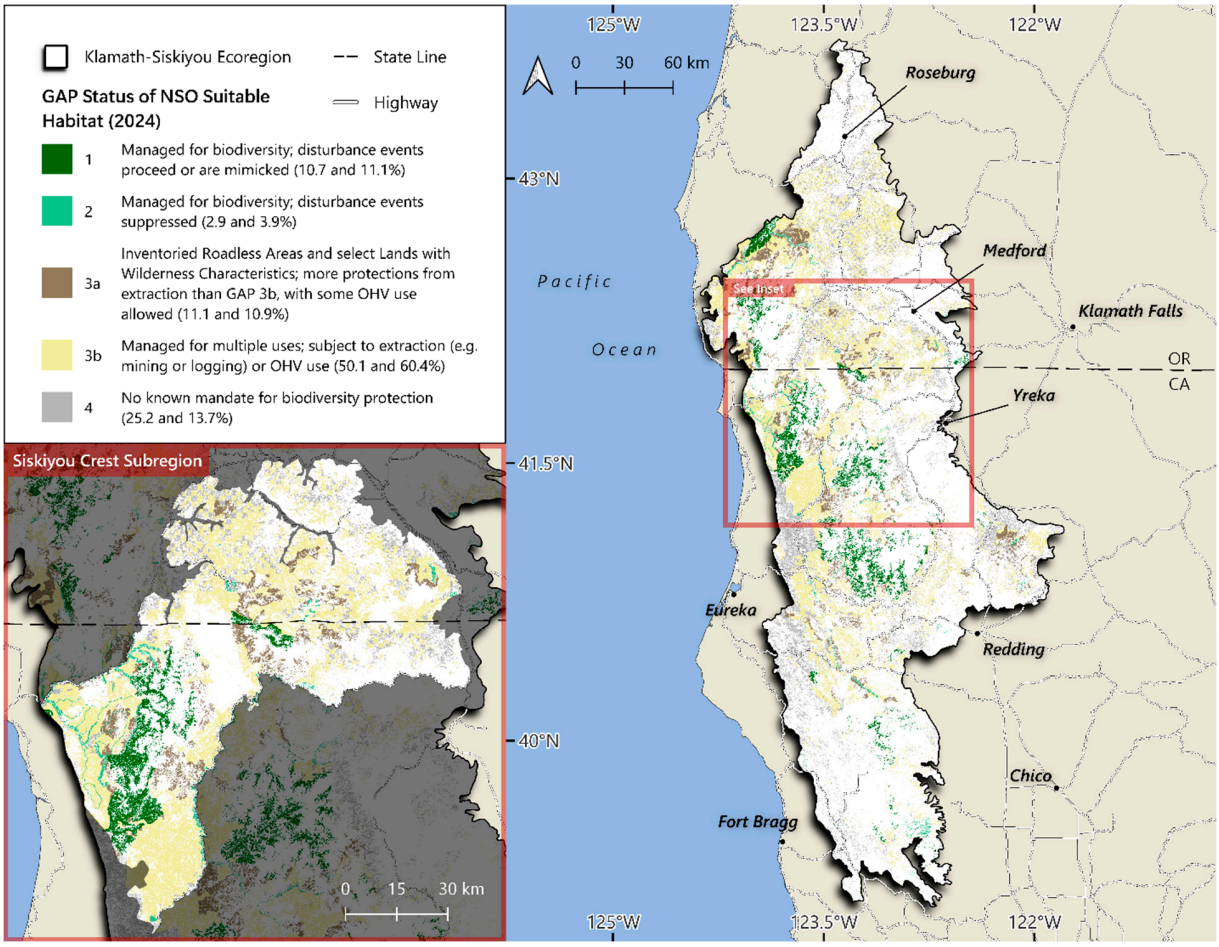

Figure S6. GAP status distribution across NSO suitable and highly suitable habitat (2024).

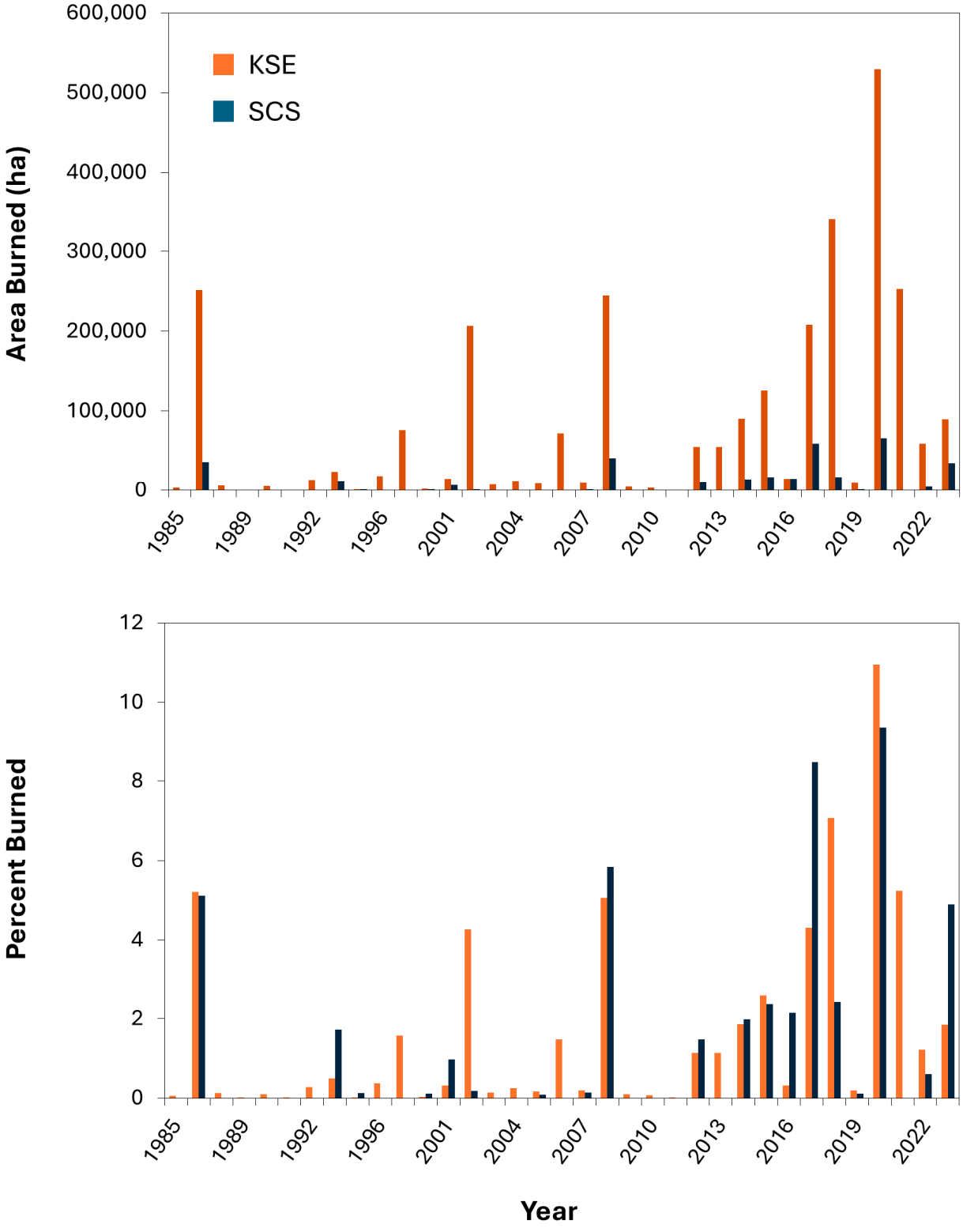

Figure S7. Annual burning rates in the KSE and SCS (1985-2023).

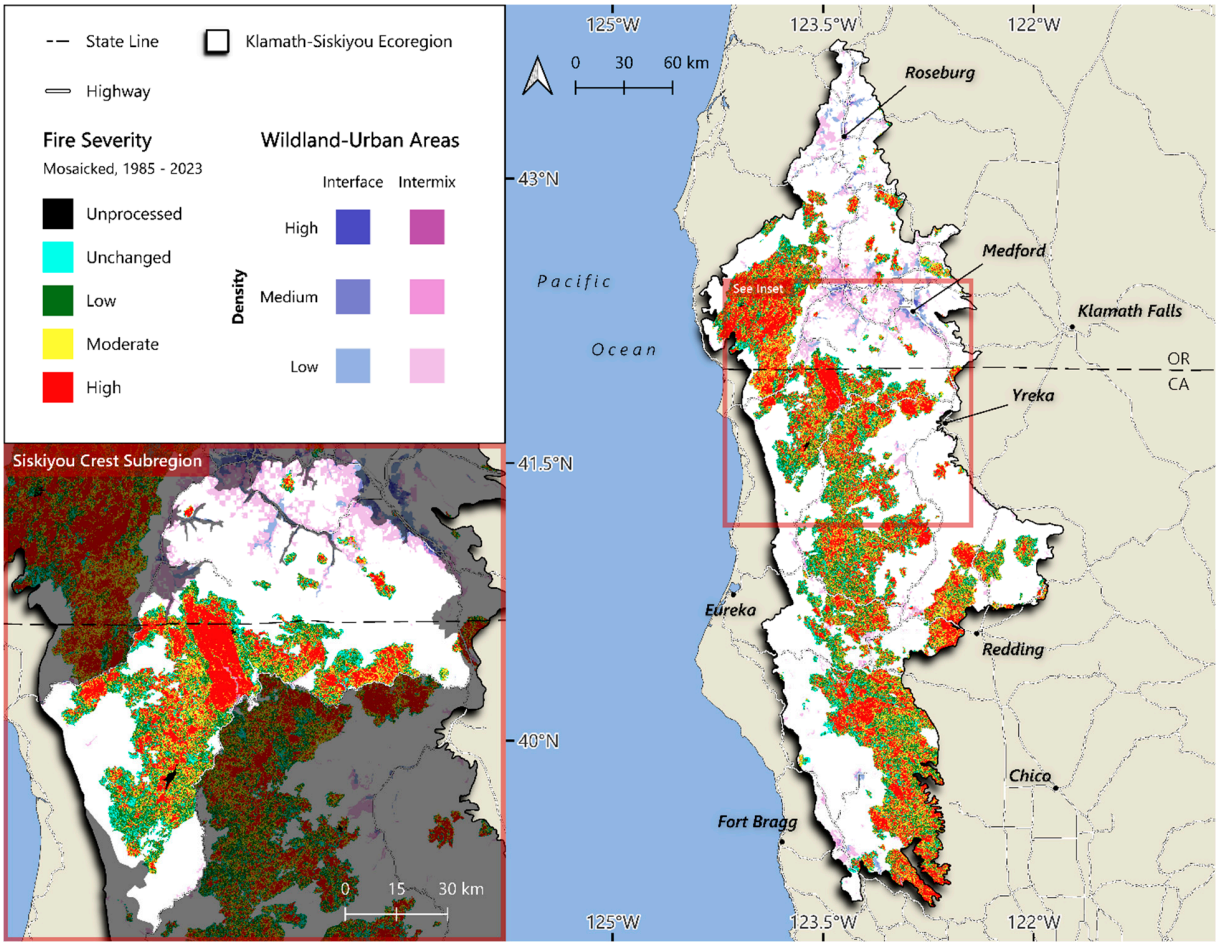

Figure S8. Mosaicked fire severity (1985-2023) across the KSE and SCS with WUI areas shown.

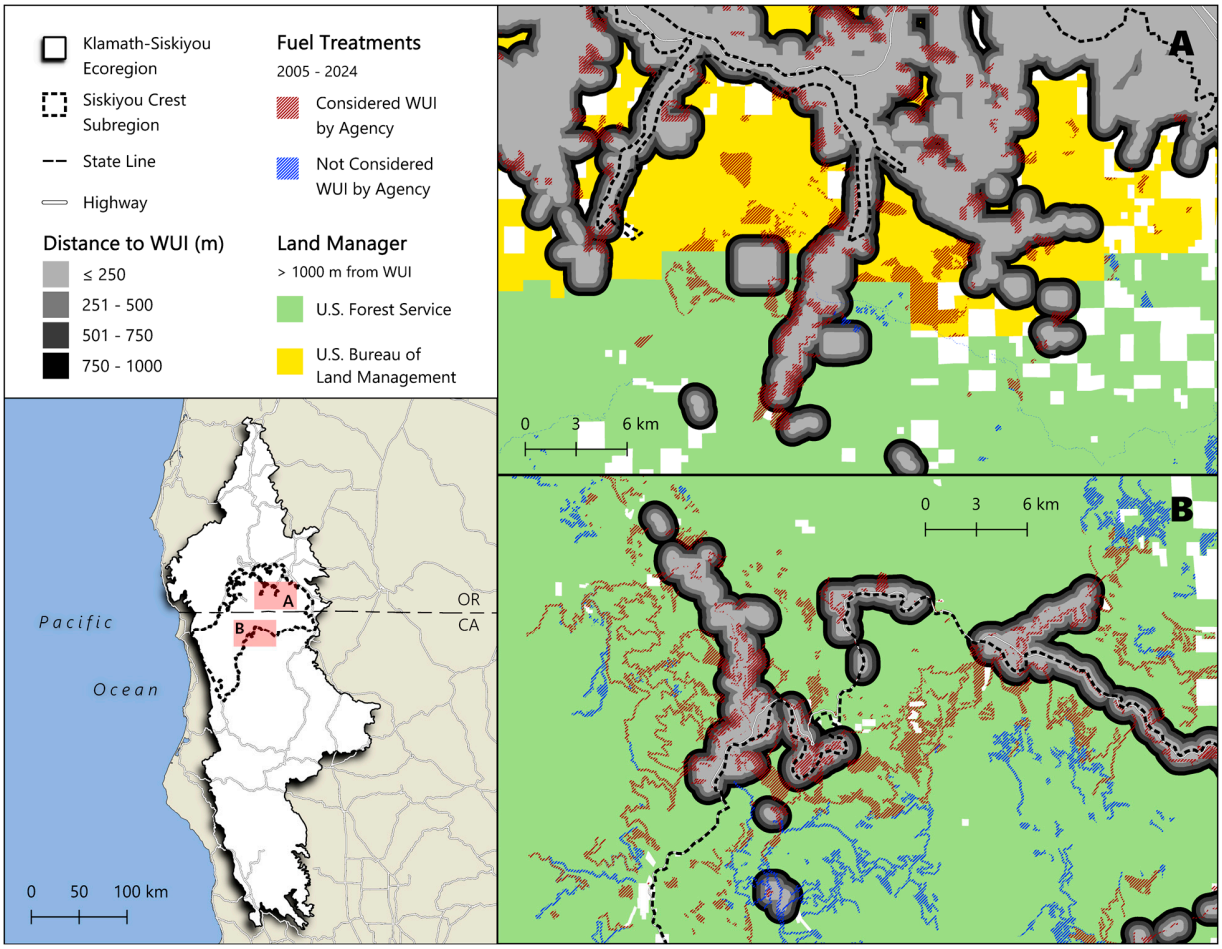

Figure S9. Mosaicked fire severity (1985-2023) across the KSE and SCS with WUI areas shown.

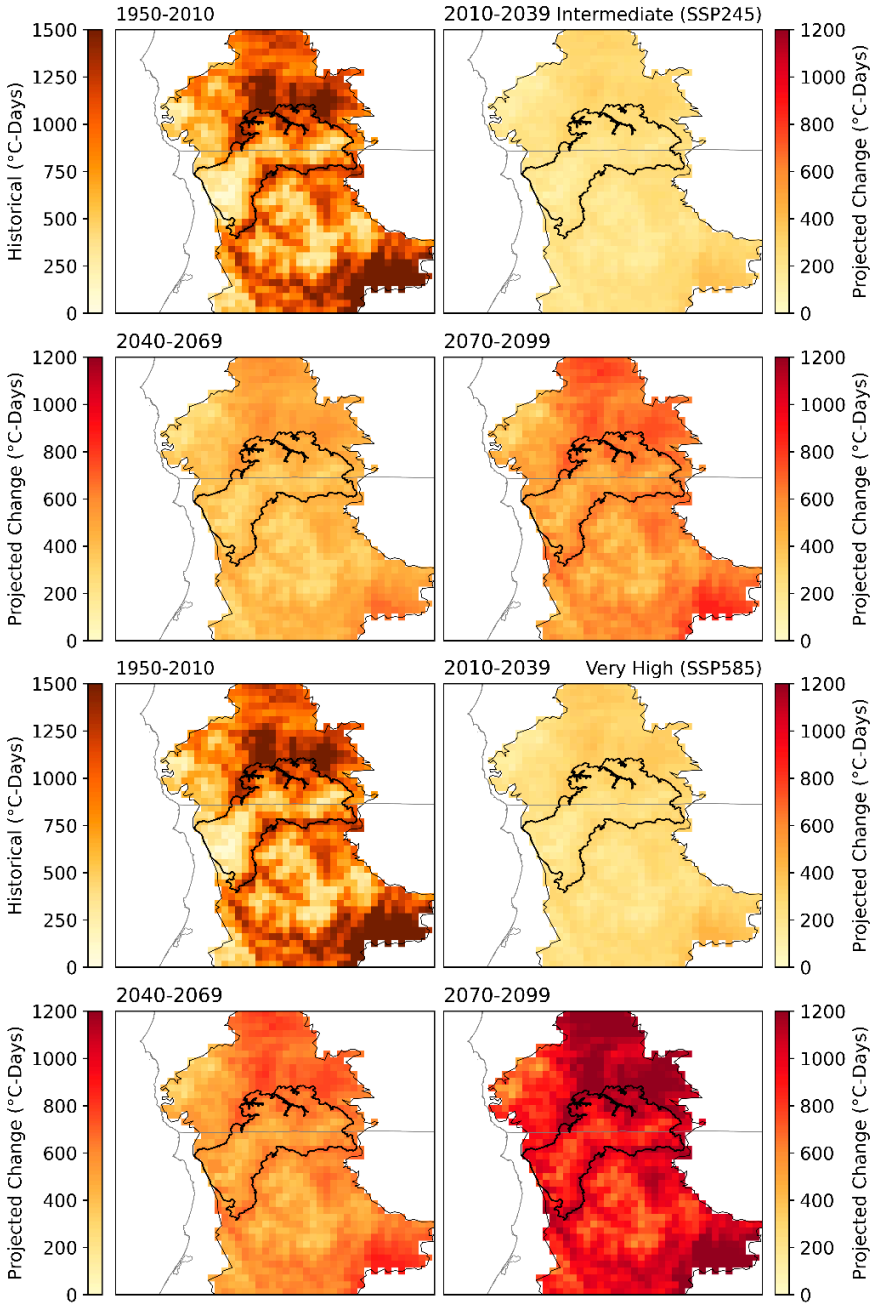

Figure S10. Model median growing-degree days for the historical period (1950-2010) and the model median projected change for the 2010-2039, 2040-2069, and 2070-2099 periods relative to historical values under the intermediate (SSP245) and very high (SSP585) emission scenario for the SCS (outline in black). Growing degree-days is defined as the total number of annual degree-days >10°C and is an indicator of heat accumulation and heat availability for plant growth.

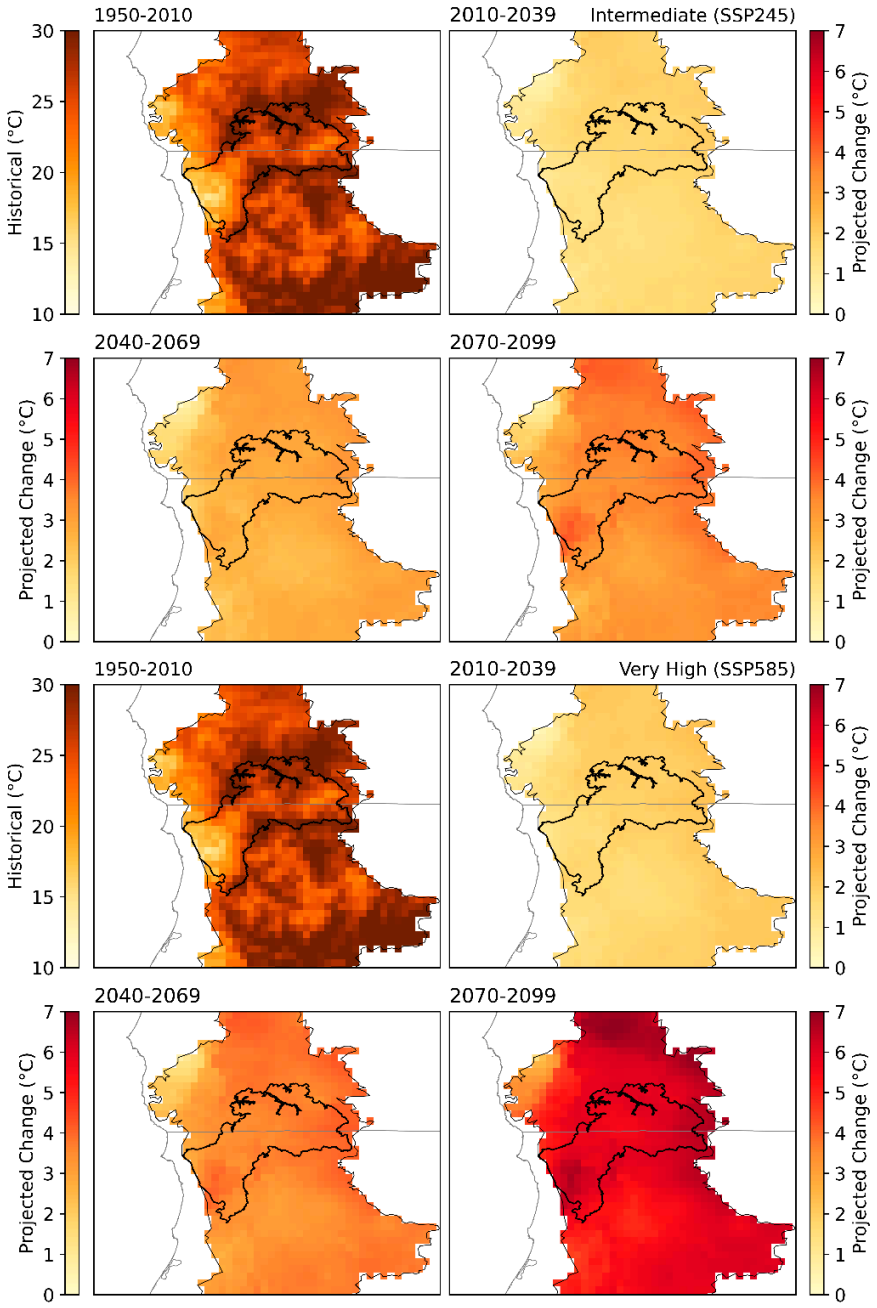

Figure S11. Model median historical (1950-2010) mean summer (JJA) maximum temperature and model median projected change in mean summer temperature for the time periods 2010-2039, 2040-2069, and 2070-2099 relative to the historical period under the intermediate (SSP245) and very high (SSP585) emissions scenarios for the SCS (outlined in black).

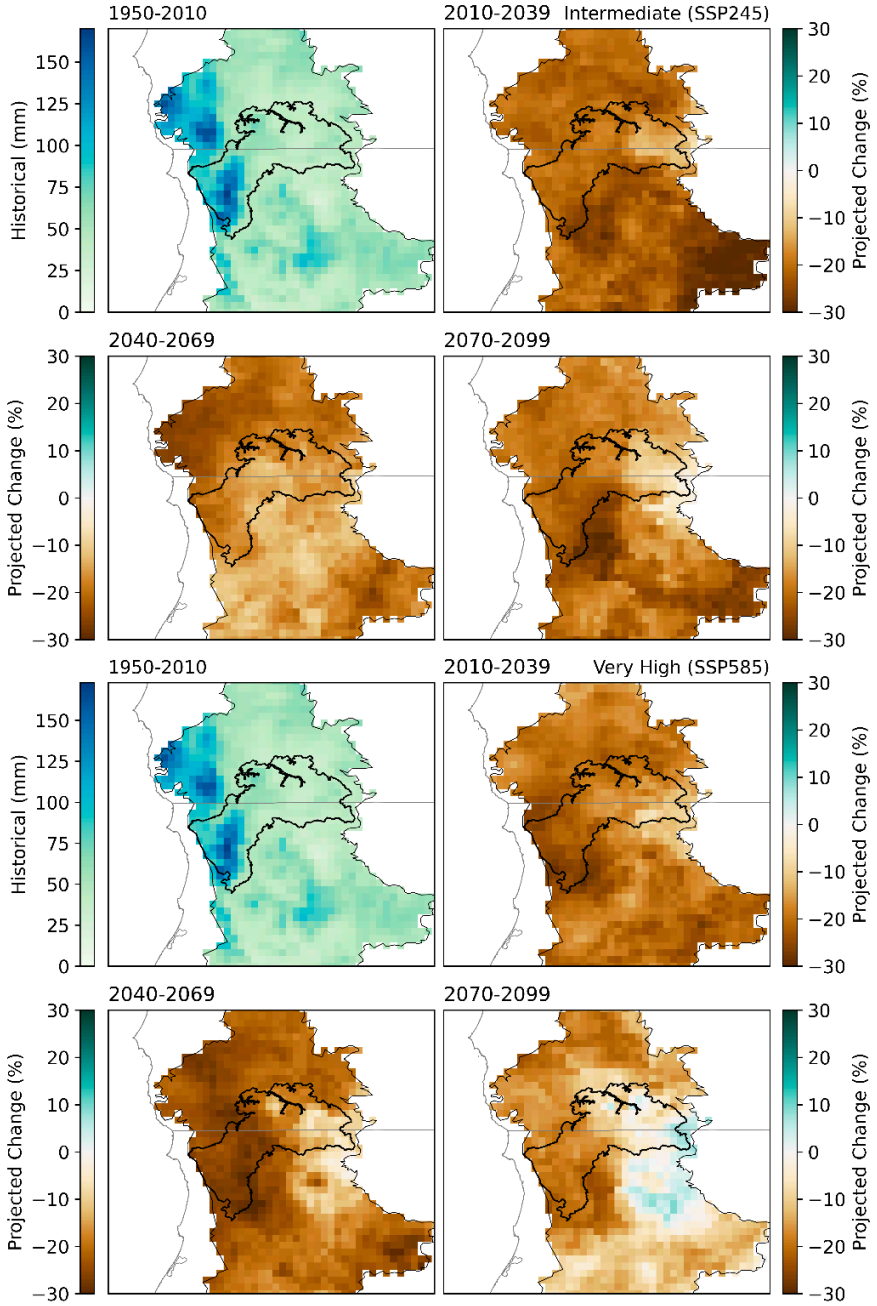

Figure S12. Model median historical (1950-2010) total summer (JJA) precipitation and model median projected change in total summer precipitation for the time periods 2010-2039, 2040-2069, and 2070-2099 relative to the historical period under the intermediate (SSP245) and very high (SSP585) emissions scenario for the SCS (outline in black).

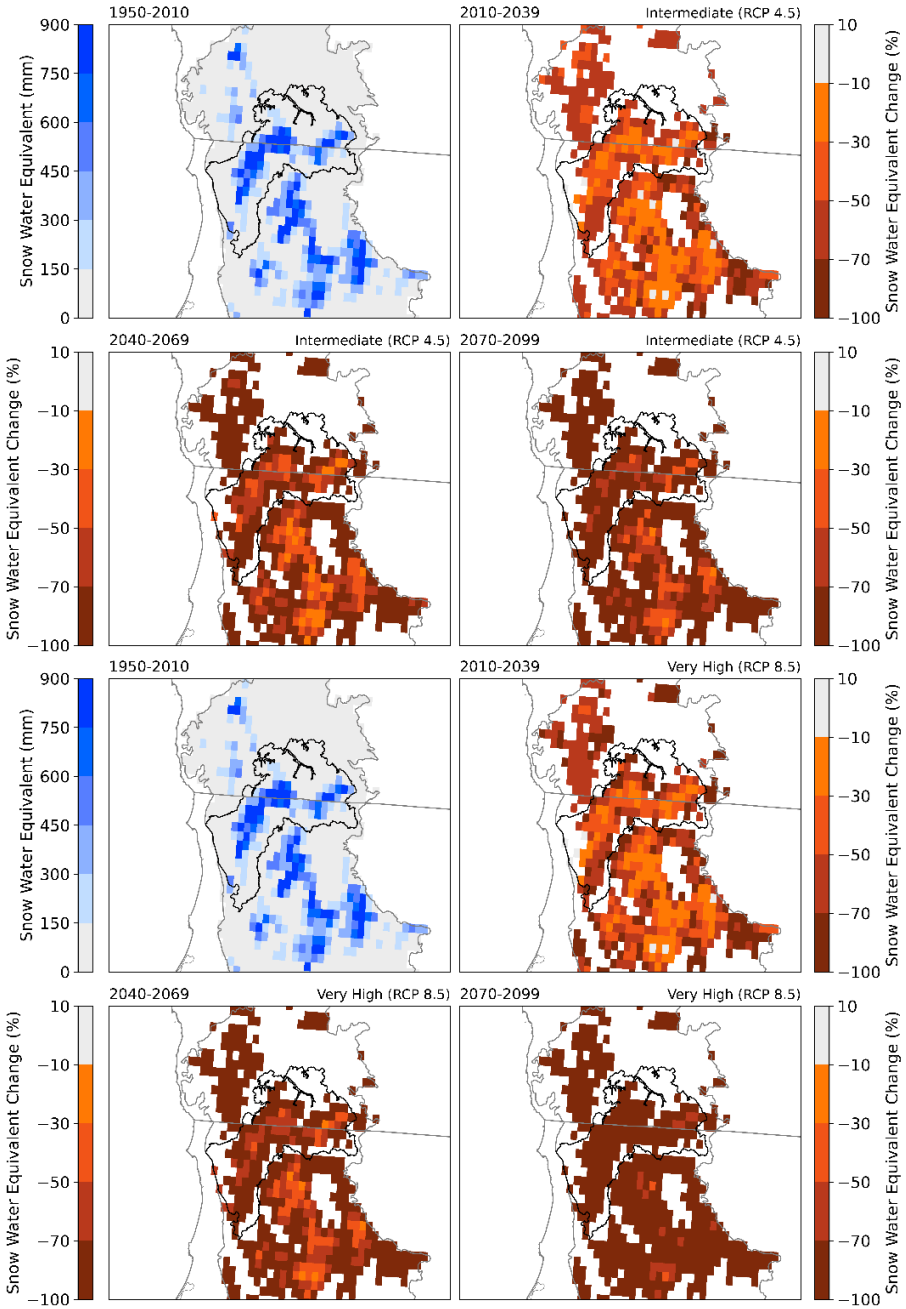

Figure S13. Model median April 1st snow-water equivalent (SWE) for the historical period (1950-2010) and the model median projected percent change in April 1st SWE relative to the historical period for the 2020-2049, 2040-2069, and 2070-2099 periods under the intermediate (RCP 4.5) and very high (RCP 8.5) climate scenarios for the SCS.

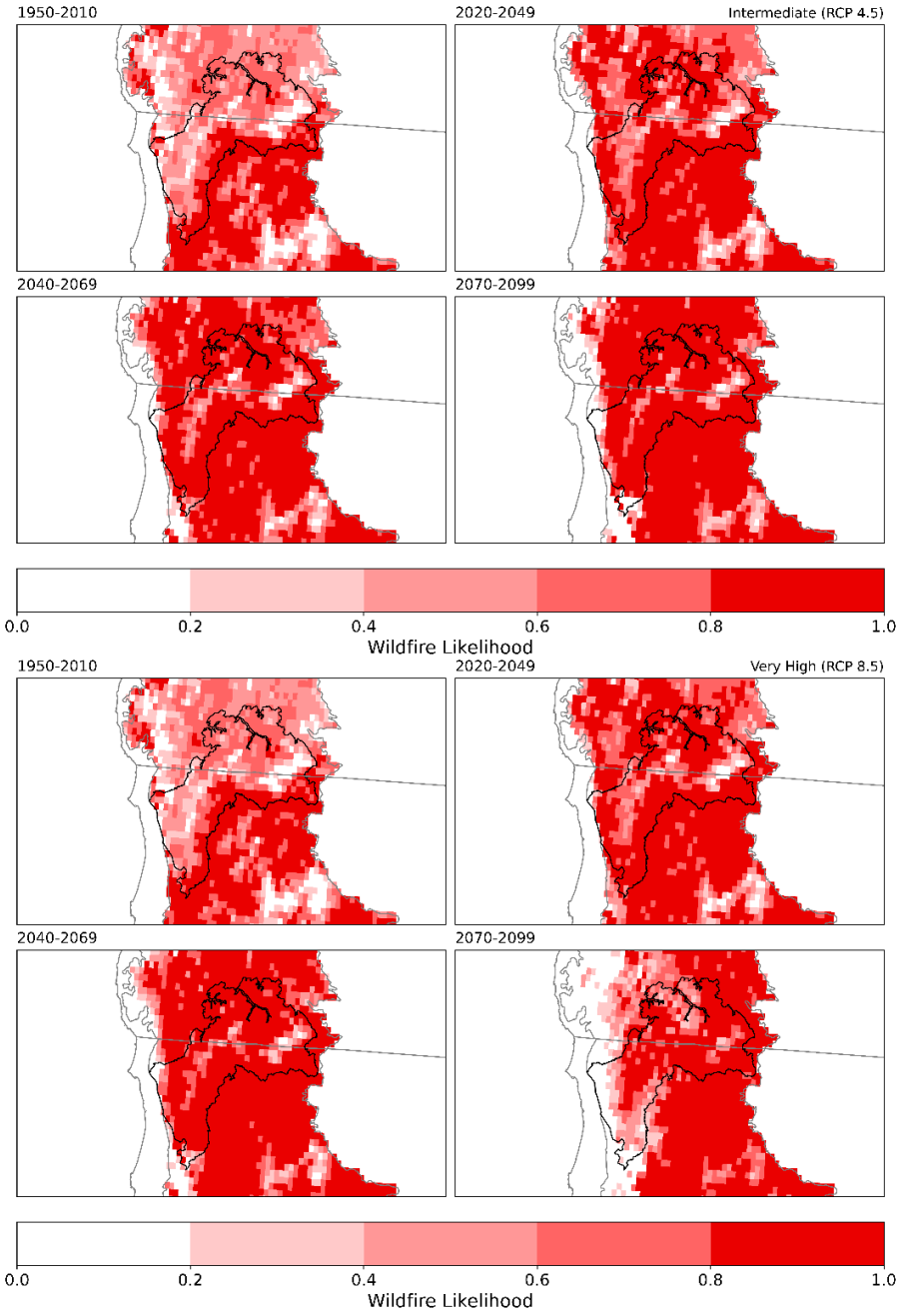

Figure S14. The average historical (1950-2010) and future likelihood of climate and fuel condition conducive for wildfire for the 2020-2049, 2040-2069, and 2070-2099 periods under both the intermediate (RCP 4.5) and very high (RCP 8.5) climate change scenarios for the SCS.

Tables

Table S1. Modified BPS land cover names and categories.

Modified BPS (Name)	Modified BPS (Category)	KSE Prescence	SCS Presence
Agricultural	Agricultural	X	X
Barren-Rock/Sand/Clay	Barren and Sparsely Vegetated	X	X
California Coastal Closed-Cone Conifer Forest and Woodland	Other Forest, Woodland, Savanna, and Shrubland	X	X
California Coastal Live Oak Woodland and Savanna	Oak Woodland and Savanna	X	
California Coastal Redwood Forest	Pacific Northwest Coastal Rainforest	X	X
California Lower Montane Blue Oak-Foothill Pine Woodland and Savanna	Oak Woodland and Savanna	X	X
California Mesic Chaparral	Chaparral	X	X
California Mesic Serpentine Grassland	Grassland	X	X
California Montane Jeffrey Pine(-Ponderosa Pine) Woodland	Ponderosa Pine Forest, Woodland and Savanna	X	X
California Montane Riparian Systems	Riparian and Wetland	X	X
California Montane Woodland and Chaparral	Chaparral	X	X

California Northern Coastal Grassland	Grassland	X	
California Xeric Serpentine Chaparral	Chaparral	X	X
Columbia Plateau Low Sagebrush Steppe	Other Forest, Woodland, Savanna, and Shrubland	X	
Columbia Plateau Steppe and Grassland	Grassland	X	
Columbia Plateau Western Juniper Woodland and Savanna	Other Forest, Woodland, Savanna, and Shrubland	X	X
Developed	Developed	X	X
East Cascades Mesic Montane Mixed-Conifer Forest and Woodland	Mesic Mixed Conifer Forest and Woodland	X	X
East Cascades Oak-Ponderosa Pine Forest and Woodland	Ponderosa Pine Forest, Woodland and Savanna	X	X
Inter-Mountain Basins Big Sagebrush Shrubland	Other Forest, Woodland, Savanna, and Shrubland	X	
Inter-Mountain Basins Big Sagebrush Steppe	Other Forest, Woodland, Savanna, and Shrubland	X	
Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	Other Forest, Woodland, Savanna, and Shrubland	X	X
Inter-Mountain Basins Greasewood Flat	Other Forest, Woodland, Savanna, and Shrubland	X	
Inter-Mountain Basins Montane Riparian Systems	Riparian and Wetland	X	X
Inter-Mountain Basins Montane Sagebrush Steppe	Other Forest, Woodland, Savanna, and Shrubland	X	X

Inter-Mountain Basins Semi-Desert Shrub-Steppe	Other Forest, Woodland, Savanna, and Shrubland	X	
Inter-Mountain Basins Sparsely Vegetated Systems	Barren and Sparsely Vegetated	X	
Klamath-Siskiyou Lower Montane Serpentine Mixed Conifer Woodland	Dry Mixed Conifer Forest and Woodland	X	X
Klamath-Siskiyou Upper Montane Serpentine Mixed Conifer Woodland	Dry Mixed Conifer Forest and Woodland	X	X
Klamath-Siskiyou Xeromorphic Serpentine Savanna and Chaparral	Chaparral	X	X
Mediterranean California Dry-Mesic Mixed Conifer Forest and Woodland	Dry Mixed Conifer Forest and Woodland	X	X
Mediterranean California Lower Montane Black Oak-Conifer Forest and Woodland	Ponderosa Pine Forest, Woodland and Savanna	X	X
Mediterranean California Mesic Mixed Conifer Forest and Woodland	Mesic Mixed Conifer Forest and Woodland	X	X
Mediterranean California Mixed Evergreen Forest-Coastal	California Mixed Evergreen Forest and Woodland	X	
Mediterranean California Mixed Evergreen Forest-Interior	California Mixed Evergreen Forest and Woodland	X	X
Mediterranean California Mixed Oak Woodland	Oak Woodland and Savanna	X	X
Mediterranean California Red Fir Forest	Red Fir Forest	X	X
Mediterranean California Sparsely Vegetated Systems	Barren and Sparsely Vegetated	X	X
Mediterranean California Subalpine Meadow	Subalpine Forest and Woodland	X	

Mediterranean California Subalpine Woodland	Subalpine Forest and Woodland	X	X
North Pacific Broadleaf Landslide Forest and Shrubland	Other Forest, Woodland, Savanna, and Shrubland	X	
North Pacific Dry Douglas-fir(-Madrone) Forest and Woodland	Dry Douglas-fir Forest and Woodland	X	X
North Pacific Dry-Mesic Silver Fir-Western Hemlock-Douglas-fir Forest	Pacific Northwest Coastal Rainforest	X	
North Pacific Hypermaritime Sitka Spruce Forest	Pacific Northwest Coastal Rainforest	X	
North Pacific Hypermaritime Western Red-cedar-Western Hemlock Forest	Pacific Northwest Coastal Rainforest	X	
North Pacific Lowland Riparian Forest and Shrubland	Riparian and Wetland	X	X
North Pacific Maritime Dry-Mesic Douglas-fir-Western Hemlock Forest	Pacific Northwest Coastal Rainforest	X	X
North Pacific Maritime Mesic-Wet Douglas-fir-Western Hemlock Forest	Pacific Northwest Coastal Rainforest	X	X
North Pacific Montane Grassland	Grassland	X	X
North Pacific Montane Riparian Woodland and Shrubland-Dry	Riparian and Wetland	X	X
North Pacific Montane Riparian Woodland and Shrubland-Wet	Riparian and Wetland	X	X
North Pacific Mountain Hemlock Forest-Xeric	Subalpine Forest and Woodland	X	X
North Pacific Oak Woodland	Oak Woodland and Savanna	X	X

North Pacific Sparsely Vegetated Systems	Barren and Sparsely Vegetated	X	
North Pacific Swamp Systems	Riparian and Wetland	X	X
North Pacific Wooded Volcanic Flowage	Other Forest, Woodland, Savanna, and Shrubland	X	
Northern and Central California Dry-Mesic Chaparral	Chaparral	X	X
Northern California Coastal Scrub	Other Shrubland	X	
Northern California Mesic Subalpine Woodland	Subalpine Forest and Woodland	X	X
Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest	Subalpine Forest and Woodland	X	
Northern Rocky Mountain Foothill Conifer Wooded Steppe	Other Forest, Woodland, Savanna, and Shrubland	X	
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna-Mesic	Ponderosa Pine Forest, Woodland and Savanna	X	X
Northern Rocky Mountain Ponderosa Pine Woodland and Savanna-Xeric	Ponderosa Pine Forest, Woodland and Savanna	X	
Open Water	Open Water and Perennial Ice/Snow	X	X
Perennial Ice/Snow	Open Water and Perennial Ice/Snow	X	
Rocky Mountain Aspen Forest and Woodland	Other Hardwood Forest and Woodland	X	
Rocky Mountain Poor-Site Lodgepole Pine Forest	Subalpine Forest and Woodland	X	

Rocky Mountain Subalpine Mesic-Wet Spruce-Fir Forest and Woodland	Subalpine Forest and Woodland	X	
Sierra Nevada Subalpine Lodgepole Pine Forest and Woodland	Subalpine Forest and Woodland	X	
Sierran-Intermontane Desert Western White Pine-White Fir Woodland	Other Forest, Woodland, Savanna, and Shrubland	X	
Willamette Valley Upland Prairie and Savanna	Grassland	X	X

Table S2. Watershed (HUC8) GAP status distribution for the KSE and SCS.

Klamath-Siskiyou Ecoregion						
Watershed (HUC8)	**GAP ha (%)**					**Total ha (%)**
	1	2	3a	3b	4	
Applegate	6755 (3.4)	1326 (0.7)	21,848 (11.0)	109,689 (55.0)	59,816 (30.0)	199,434 (4.1)
Big-Navarro-Garcia	0 (0.0)	76 (1.7)	0 (0.0)	0 (0.0)	4370 (98.3)	4447 (0.1)
Chetco	40,304 (34.6)	1585 (1.4)	15,078 (12.9)	41,131 (35.3)	18,510 (15.9)	116,609 (2.4)
Clear Creek-Sacramento River	0 (0.0)	16,325 (25.7)	51 (0.1)	24,061 (37.9)	23,054 (36.3)	63,492 (1.3)
Coquille	23 (0.1)	0 (0.0)	93 (0.6)	6310 (37.8)	10,258 (61.5)	16,684 (0.4)
Cottonwood Creek	18,408 (24.8)	481 (0.7)	4869 (6.6)	25,428 (34.3)	25,066 (33.8)	74,251 (1.5)
Cow Creek	0 (0.0)	0 (0.0)	0 (0.0)	136 (1.9)	7213 (98.2)	7349 (0.2)
Illinois	28,192 (11.0)	6184 (2.4)	68,082 (26.6)	107,593 (42.0)	46,360 (18.1)	256,412 (5.3)
Lower Eel	14,145 (4.8)	4778 (1.6)	10,305 (3.5)	41,213 (14.1)	222,177 (75.9)	292,618 (6.1)
Lower Klamath	69,880 (20.9)	8430 (2.5)	48,948 (14.7)	161,512 (48.4)	45,101 (13.5)	333,871 (6.9)
Lower Pit	0 (0.0)	2320 (2.7)	10,068 (11.6)	40,740 (47.1)	33,358 (38.6)	86,486 (1.8)
Lower Rogue	13,676 (6.8)	7043 (3.5)	28,940 (14.3)	95,298 (47.2)	56,851 (28.2)	201,806 (4.2)
Mad-Redwood	482 (0.5)	255 (0.3)	5580 (6.0)	44,055 (47.0)	43,356 (46.3)	93,727 (1.9)
McCloud	0 (0.0)	949 (1.4)	19,789 (29.2)	21,201 (31.3)	25,836 (38.1)	67,776 (1.4)
Middle Fork Eel	64,031	4874	6453	51,428	68,351	195,137

	(32.8)	(2.5)	(3.3)	(26.4)	(35.0)	(4.0)
Middle Rogue	1028 (0.5)	6136 (2.8)	2984 (1.4)	55,873 (25.5)	152,839 (69.8)	218,859 (4.5)
North Umpqua	13 (0.0)	0 (0.0)	0 (0.0)	4594 (10.1)	40,822 (89.9)	45,430 (0.9)
Paynes Creek-Sacramento River	0 (0.0)	0 (0.0)	0 (0.0)	53 (7.1)	684 (92.9)	737 (0.0)
Russian	0 (0.0)	2 (0.0)	0 (0.0)	223 (0.6)	39,673 (99.4)	39,897 (0.8)
Sacramento Headwaters	4451 (3.3)	1418 (1.0)	13,054 (9.6)	59,651 (43.8)	57,782 (42.4)	136,355 (2.8)
Salmon	88,397 (45.4)	5209 (2.7)	41,198 (21.2)	57,706 (29.7)	2074 (1.1)	194,584 (4.0)
Scott	22,038 (10.5)	2332 (1.1)	10,386 (4.9)	45,423 (21.5)	130,688 (62.0)	210,866 (4.4)
Shasta	0 (0.0)	9 (0.0)	908 (2.0)	15,472 (34.6)	28,321 (63.3)	44,710 (0.9)
Smith	31,970 (20.2)	21,504 (13.6)	35,734 (22.6)	63,746 (40.3)	5089 (3.2)	158,042 (3.3)
South Fork Eel	2187 (4.5)	1232 (2.5)	0 (0.0)	1436 (2.9)	44,182 (90.1)	49,036 (1.0)
South Fork Trinity	5087 (2.1)	8181 (3.4)	39,359 (16.3)	145,362 (60.2)	43,429 (18.0)	241,417 (5.0)
South Umpqua	355 (0.1)	31 (0.0)	35 (0.0)	99,745 (33.1)	201,081 (66.8)	301,246 (6.2)
Thomes Creek-Sacramento River	3106 (6.2)	423 (0.8)	3430 (6.8)	20,690 (41.0)	22,763 (45.2)	50,412 (1.0)
Trinity	179,978 (34.1)	6950 (1.3)	33,263 (6.3)	157,536 (29.9)	149,960 (28.4)	527,687 (10.9)
Umpqua	0 (0.0)	0 (0.0)	0 (0.0)	6281 (8.2)	70,279 (91.8)	76,560 (1.6)
Upper Cache	0 (0.0)	10,454 (41.4)	0 (0.0)	8010 (31.7)	6804 (26.9)	25,268 (0.5)
Upper Eel	13,896 (8.2)	25,624 (15.1)	670 (0.4)	38,656 (22.8)	90,490 (53.4)	169,335 (3.5)
Upper Klamath	6294 (3.8)	7774 (4.7)	12,012 (7.3)	79,201 (48.1)	59,363 (36.1)	164,644 (3.4)

Upper Rogue		57 (0.1)	860 (0.7)	1532 (1.3)	34,568 (29.9)	78,484 (68.0)	115,499 (2.4)
Upper Stony		9453 (17.2)	251 (0.5)	4104 (7.4)	38,843 (70.5)	2473 (4.5)	55,125 (1.1)
	Total ha	624,204	153,016	438,769	1,702,860	1,916,957	4,835,805
	%	(12.9)	(3.2)	(9.1)	(35.2)	(39.6)	(100.0)
Siskiyou Crest Subregion							
Applegate		6755 (3.8)	1157 (0.7)	21,837 (12.2)	103,096 (57.5)	46,426 (25.9)	179,270 (25.7)
Illinois		3307 (4.0)	947 (1.2)	5301 (6.5)	49,153 (59.8)	23,534 (28.6)	82,242 (11.8)
Lower Klamath		47,025 (23.8)	4296 (2.2)	37,108 (18.8)	102,142 (51.7)	7184 (3.6)	197,755 (28.3)
Middle Rogue		0 (0.0)	534 (1.0)	2984 (5.6)	18,623 (35.2)	30,814 (58.2)	52,955 (7.6)
Scott		0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (100.0)	0 (0.0)
Smith		24,199 (25.1)	11,330 (11.8)	9944 (10.3)	47,496 (49.3)	3284 (3.4)	96,253 (13.8)
Upper Klamath		6 (0.0)	2361 (2.6)	5844 (6.5)	45,569 (50.5)	36,501 (40.4)	90,281 (12.9)
	Total ha	81,291	20,626	83,017	366,079	147,742	698,755
	%	(11.6)	(3.0)	(11.9)	(52.4)	(21.1)	(100.0)

Table S3. Serpentine GAP status distribution for the KSE and SCS.

Serpentine Areas	GAP ha (%)					Total ha (%)
	1	2	3a	3b	4	
KSE	122,474 (21.1)	18,792 (3.2)	91,540 (15.8)	230,385 (39.7)	117,316 (20.2)	580,507 (100.0)
SCS	28,585 (21.9)	5219 (4.0)	19,483 (14.9)	62,806 (48.1)	14,556 (11.1)	130,649 (100.0)

Table S4. Pacific fisher connectivity areas GAP status distribution for the KSE and SCS.

Pacific Fisher Connectivity Areas	GAP ha (%)					Total ha (%)
	1	2	3a	3b	4	
KSE	93,242 (5.8)	49,773 (3.1)	131,626 (8.2)	842,062 (52.6)	483,423 (30.2)	1,600,126 (100.0)
SCS	23,853 (6.2)	11,869 (3.1)	37,449 (9.8)	240,915 (62.9)	69,164 (18.1)	383,249 (100.0)

Table S5. GAP status distribution across areas that burned one to five times between 1985 and 2023 in the KSE and SCS.

Klamath-Siskiyou Ecoregion							
Number of Fires (1985-2024)		**GAP ha (%)**					**Total ha (%)**
		1	2	3a	3b	4	
1		258,727 (19.1)	60,238 (4.5)	174,752 (12.9)	606,177 (44.8)	253,890 (18.8)	1,353,785 (66.6)
2		194,373 (33.2)	37,759 (6.5)	130,075 (22.2)	180,489 (30.9)	42,355 (7.2)	585,050 (28.8)
3		45,006 (48.1)	2654 (2.8)	21,258 (22.7)	22,770 (24.3)	1909 (2.0)	93,598 (4.6)
4		777 (53.5)	10 (0.7)	247 (17.0)	417 (28.7)	0 (0.0)	1452 (0.1)
5		244 (97.3)	0 (0.0)	1 (0.3)	6 (2.4)	0 (0.0)	250 (0.0)
	Total ha	499,127	100,661	326,333	809,860	298,154	2,034,136
	%	(24.5)	(5.0)	(16.0)	(39.8)	(14.7)	(100.0)
Siskiyou Crest Subregion							
1		54,071 (26.4)	5360 (2.6)	24,767 (12.1)	101,643 (49.6)	18,990 (9.3)	204,830 (76.5)
2		8204 (14.3)	793 (1.4)	21,650 (37.8)	23,757 (41.5)	2835 (5.0)	57,238 (21.4)
3		264 (4.7)	7 (0.1)	3932 (70.2)	1123 (20.1)	276 (4.9)	5602 (2.1)
4		0 (0.0)	0 (0.0)	16 (30.0)	37 (70.0)	0 (0.0)	53 (0.0)
	Total ha	62,538	6159	50,365	126,559	22,101	267,722
	%	(23.4)	(2.3)	(18.8)	(47.3)	(8.3)	(100.0)

Table S6. High severity fire area and percent high severity fire across protected (GAP 1 and 2), protected+ (GAP 1, 2, and 3a), and managed areas (GAP 3b and 4) in only dry and mesic mixed conifer forest and woodland, dry Douglas-fir forest and woodland, and ponderosa pine forest, woodland and savanna land cover categories.

Region	Elevation	High Severity Fire (ha)			% High Severity Fire		
		Protected	Protected+	Managed	Protected	Protected+	Managed
KSE	0 - 0500	2714	4005	6265	27.2	29.1	24.8
	0501 - 1000	21,762	49,535	84,221	37.1	37.9	35.3
	1001 - 1500	58,526	93,542	128,554	36.3	37.8	41.0
	1501 - 2000	36,730	42,738	30,571	39.8	40.3	40.3
	2001 - 2500	211	225	29	34.8	35.4	42.8
SCS	0 - 0500	27	54	281	6.0	9.7	25.7
	0501 - 1000	804	2384	13,104	24.1	21.8	40.5
	1001 - 1500	8450	16,503	21,899	31.9	34.5	45.4
	1501 - 2000	2009	3727	2274	39.1	43.5	43.6
	2001 - 2500	0	0	0	0.0	10.5	0.0

Table S7. SCS-average model median growing degree-days, summer mean temperature, and summer precipitation for historical (1950-2010) and model median projected change for the 2010-2039, 2040-2069, and 2070-2099 periods relative to the historical values under the intermediate (SSP245) and very high (SSP585) emissions scenarios. Growing degree-days are the total number of degree-days above 10°C and are an indicator of heat accumulation and heat availability for plant growth.

Metric & Scenario	1950-2010	2010-2039	2040-2069	2070-2099
Growing Degree Days (Intermediate)	930°C-days (846 to 964)	+233°C-days (170 to 385)	+434°C-days (295 to 667)	+579°C-days (390 to 889)
Growing Degree Days (Very High)	930°C-days (846 to 964)	+266°C-days (173 to 402)	+583°C-days (401 to 854)	+1007°C-days (745 to 1570)
Summer Mean Temperature (Intermediate)	26.3°C (25.7 to 26.6)	+1.5°C (0.85 to 2.9)	+2.6°C (1.8 to 4.7)	+3.3°C (1.9 to 6.0)
Summer Mean Temperature (Very High)	26.3°C (25.7 to 26.6)	+1.8°C (0.9 to 3.2)	+3.5°C (2.4 to 5.9)	+5.6°C (3.8 to 9.5)
Summer Precipitation (Intermediate)	56mm (47 to 64)	-21% (-48 to +34)	-14% (-51 to +55)	-22% (-42 to +52)
Summer Precipitation (Very High)	56mm (47 to 64)	-19% (-55 to +14)	-23% (-56 to +50)	-14% (-50 to +86)