SUPPLEMENTARY MATERIALS

Table 1S. Data sources and associated references for each of the 21 metrics included in the comparison of two contrasting management scenarios in the central Sierra Nevada, USA.

Pillar	Element	Metric	Data Sources	References
Forest Resilience	Forest Structure	Tree density	NCX, LANDIS-II, contemporary reference areas, climate classes, landcape management units	North, 2012; Jeronimo et al., 2019
		Basal area	NCX, Forest Inventory and Analysis (FIA), LANDIS-II	North, 2012; Jeronimo et al., 2019
		Structural heterogeneity	NCX, LANDIS-II, California Forest Observatory, contemporary reference areas	North, 2012; Jeronimo et al., 2019
		Large tree density	NCX, LANDIS-II, contemporary reference conditions	North, 2012; Stephens et al., 2015; Jeronimo et al., 2019
	Vegetation Composition	Seral stage	NCX, LANDIS-II	Mayer and Laudenslayer, 1988; Collins and Stephens, 2010; North, 2012; Jeronimo et al., 2019
		Evenness	NCX, LANDIS-II	Shannon, 1948; Pielou, 1966; North, 2012; Jeronimo et al., 2019
	Disturbance	Disturbance return interval frequency	Multiple state sources and literature, FRAP, CalMAPPER, FACTS, LANDIS-II, eDaRT	Hansen et al., 2013; Safford and van de Water, 2014; Fettig et al., 2019; Koltunov et al. 2020
		Disturbance delinquency	Multiple state sources and literature, FRAP, CalMAPPER, FACTS, LANDIS-II, eDaRT	Hansen et al., 2013; Safford and van de Water, 2014; Fettig et al., 2019; Koltunov et al., 2020

Table 1S cont.

Fire Dynamics	Fire Severity	Probability of high severity fire	FLEP-Gen, LANDIS-II	Scott et al., 2013; Scott, 2020; Manley et al., 2023
		Probability of large high severity patches	FLEP-Gen, LANDIS-II	Collins and Stephens, 2010; Scott et al., 2013; Safford and Stevens, 2017; Scott, 2020; Manley et al., 2023
	Functional Fire	Fire as disturbance	FLEP-Gen, LANDIS-II	Collins and Stephens, 2010; Miller et al., 2012; Scott et al., 2013; Scott, 2020; Manley et al., 2023
Fire-adapted Communities	Fire Hazard	Probability of low severity fire in WUI	USEPA ORD 2017, FLEP-Gen, LANDIS-II, Healthy Forests Restoration Act (HFRA) of 2003 (16 U.S.C. §§108–148)	Scott, 2020
Carbon Sequestration	Carbon Storage	Total AGL carbon	LANDIS-II, USDA NRCS 2020	Wilson et al., 2013; Maxwell et al., 2022; Manley et al., 2023
Biodiversity Conservation	Focal Species	California spotted owl	LANDIS-II	Gutierrez et al., 2017
	Species Diversity	Species richness	CDFW CIWTG 2014, LANDIS-II	Mayer and Laudenslayer, 1988
		Old forest species richness	CDFW CIWTG 2014, LANDIS-II	Mayer and Laudenslayer, 1988
	Community Integrity	Functional group diversity (5 groups)	CDFW CIWTG 2014, LANDIS-II	Mayer and Laudenslayer, 1988; Laureto et al., 2015

Table 2S. Rank values used to prioritize the selection of areas for treatment in the Ecosystem Resilience management strategy. Rank values were assigned to combined objectives of treating priority landscape conditions (first column) and of maximizing the number of pillars (remaining columns) that could be improved by management in a given location. Treatment areas were created and selected within each HUC-12 watershed based on rank value (ranging from 1 to 35). Lower rank values were a higher priority for selection.

	Number of pillars available for improvement				
Landscape conditions (high to low priority)	**0**	**1**	**2**	**3**	**4**
Infrastructure	5	4	3	2	1
High value resources - in moderate condition	10	9	8	7	6
High value resources - at risk from climate	24	20	16	13	11
Protect	27	23	19	15	12
Adapt	29	26	22	18	14
Neutral	30	28	25	21	17
Transform	35	34	33	32	31

Table 3S. Correlation matrix for the metrics representing conditions across the landscape. Outlined cells indicate correlation coefficients > 0.25 (positive or negative) and considered a linked response. Based on raw values derived for forested areas within the 1-M hectare Tahoe Central Sierra Initiative landscape in California and Nevada, USA (Manley et al., 2023).

Pillar	Metric	Tree density	Basal area	Hetero-geneity (gap)	Hetero-geneity (fractal)	Large tree density	Seral stage	Evenness
Forest resilience	Tree density	1.00						
Forest resilience	Basal area	0.52	1.00					
Forest resilience	Heterogeneity (gap)	-0.37	-0.52	1.00				
Forest resilience	Heterogeneity (fractal)	-0.38	-0.52	0.83	1.00			
Forest resilience	Large tree density	-0.09	0.50	-0.19	-0.22	1.00		
Forest resilience	Seral stage	0.04	0.05	-0.07	-0.09	0.03	1.00	
Forest resilience	Evenness	-0.10	-0.19	0.05	0.01	-0.08	-0.01	1.00
Forest resilience	Disturb. return interval	0.09	0.14	-0.13	-0.12	0.06	-0.01	0.02
Forest resilience	Disturb. delinquency	-0.02	0.04	0.08	0.16	0.02	-0.05	0.05
Fire dynamics	Prob. HS fire	0.21	0.24	-0.38	-0.48	0.11	0.08	0.01
Fire dynamics	HS patch size	0.07	0.02	-0.17	-0.29	0.00	0.08	0.11
Fire dynamics	Fire return interval	0.09	0.11	-0.13	-0.19	0.04	0.03	-0.07
Fire-adapted communities	Prob. of LS fire	-0.17	-0.15	0.34	0.43	-0.06	-0.10	-0.02
Carbon sequestration	Stable carbon	0.35	0.63	-0.45	-0.43	0.31	0.06	-0.23

Table 3S cont.

Pillar	Metric	Disturbance return interval departure	Disturbance delinquency	Probability of high severity fire	High severity patch size	Fire return interval departure	Probability of low severity fire
Forest resilience	Tree density						
Forest resilience	Basal area						
Forest resilience	Heterogeneity (gap)						
Forest resilience	Heterogeneity (fractal)						
Forest resilience	Large tree density						
Forest resilience	Seral stage						
Forest resilience	Evenness						
Forest resilience	Disturb. return interval	1.00					
Forest resilience	Disturb. delinquency	0.44	1.00				
Fire dynamics	Prob.HS fire	0.19	-0.13	1.00			
Fire dynamics	HS patch size	0.09	-0.06	0.08	1.00		
Fire dynamics	Fire return interval	0.15	-0.47	0.17	0.08	1.00	
Fire-adapted communities	Prob. of LS fire	-0.17	0.15	-0.76	-0.33	-0.18	1.00
Carbon sequestration	Stable carbon	0.13	0.02	0.23	0.12	0.11	-0.20

Table 4S. Proportion of the landscape where treatments resulted in changes in condition scores for each of the metrics by each of the management scenarios, Fire Risk Reduction (Fire) and Ecosystem Resilience (Ecosystem). Management scenarios targeted two thresholds for achieving desired conditions: 50% and 75% of all landscape units in target conditions. Areas selected for treatment to reach the 50% threshold level were augmented by additional acres selected for treatment to reach the 75% threshold. Proportions reveal the influence that each metric had on post-treatment conditions and the associated metric, pillar, and ecosystem condition scores by scenario. Metrics are sorted from high to low proportions for each scenario.

Pillar	Metric (threshold %)	Down-graded from >0 to 0	Down-graded from 0 to -0.5	Down-graded from -0.5 to -1	Upgraded from <0 to 0	Upgraded from 0 to +0.5	Upgraded from 0.5 to 1	Upgraded to +1	Total proportion
Fire scenario									
Forest resilience	Disturb. delinquency 75	x	x	x	x	x	x	0.40	0.40
Forest resilience	Disturb. return interval 75	x	x	x	0.30	0.06	0.04	x	0.40
Carbon sequestration	Carbon 75	0.29	0.08	0.01	x	x	x	x	0.38
Forest resilience	Basal area 75	0.36	0.00	0.00	x	x	x	x	0.37
Fire-adapted comm.	Low severity fire 75	x	x	x	x	x	x	0.35	0.35
Fire dynamics	High severity fire 75	x	x	x	x	x	x	0.35	0.35
Fire dynamics	High severity patch size 75	x	x	x	0.20	0.01	0.03	x	0.24
Forest resilience	Disturb. delinquency 50	x	x	x	x	x	x	0.18	0.18
Forest resilience	Disturb. return interval 50	x	x	x	0.14	0.03	0.02	x	0.18
Carbon sequestration	Carbon 50	0.13	0.04	0.01	x	x	x	x	0.17
Fire-adapted comm.	Low severity fire 50	x	x	x	x	x	x	0.17	0.17
Fire dynamics	High severity fire 50	x	x	x	x	x	x	0.17	0.17
Forest resilience	Basal area 50	0.16	0.00	0.00	x	x	x	x	0.17
Forest resilience	Tree density 75	x	x	x	x	x	x	0.16	0.16
Fire dynamics	High severity patch size 50	x	x	x	0.11	0.00	0.01	x	0.12
Forest resilience	Tree density 50	x	x	x	x	x	x	0.07	0.07

Table 4S cont.

Pillar	Metric (threshold %)	Down-graded from >0 to 0	Down-graded from 0 to -0.5	Down-graded from -0.5 to -1	Upgraded from <0 to 0	Upgraded from 0 to +0.5	Upgraded from 0.5 to 1	Upgraded to +1	Total proportion
Ecosystem scenario									
Forest resilience	Disturbance delinquency 75	x	x	x	x	x	x	0.60	0.60
Forest resilience	Disturbance return interval 75	x	x	x	0.44	0.09	0.06	x	0.59
Fire-adapted comm.	Low severity fire 75	x	x	x	x	x	x	0.46	0.46
Fire dynamics	High severity fire 75	x	x	x	0.29	0.03	0.15	x	0.46
Forest resilience	Heterogeneity 75	x	x	x	x	x	x	0.41	0.41
Forest resilience	Disturbance delinquency 50	x	x	x	x	x	x	0.40	0.40
Forest resilience	Disturbance return interval 50	x	x	x	0.30	0.06	0.03	x	0.39
Fire-adapted comm.	Low severity fire 50	x	x	x	x	x	x	0.32	0.32
Fire dynamics	High severity fire 50	x	x	x	0.22	0.02	0.08	x	0.32
Forest resilience	Heterogeneity 50	x	x	x	x	x	x	0.30	0.30
Forest resilience	Tree density 75	x	x	x	x	x	x	0.23	0.23
Forest resilience	Tree density 50	x	x	x	x	x	x	0.16	0.16

Figure 1S. Flow diagram outlining the linkages between initial, intermediate, and final products used in the selection of treatments and the evaluation of scenario outcomes. Orange boxes indicate primary outcomes used to evaluate two management scenarios: 1) fire risk reduction, and 2) improve ecosystem resilience. Blue boxes indicate the primary criteria used to drive the selection of treatment locations in one or both scenarios.