

Supplementary Material

Table S1. Location and site characteristics for the whitebark pine sample frame in Yosemite National Park, CA, USA (n = 35). Location coordinates (Easting, Northing) are in UTM NAD83, zone 11N.

Plot ID	Panel	Est. Year	Easting	Northing	Aspect (°)	Elevation (m)	Slope (°)
PINALB_3	1	2011	296088	4182250	335	3369	22
PINALB_4	1	2011	290567	4185341	260	3201	11
PINALB_6	1	2015	279029	4195055	230	3086	18
PINALB_7	1	2011	286330	4191023	48	3004	15
PINALB_8	1	2011	295120	4177650	263	3230	14
PINALB_10	1	2011	296034	4197576	240	2981	8
PINALB_14	1	2011	298862	4191734	235	2735	27
PINALB_15	1	2011	294711	4185917	255	3220	5
PINALB_16	1	2015	268730	4223684	310	3022	12
PINALB_18	1	2013	295937	4212170	298	3108	25
PINALB_19	1	2014	303605	4189886	90	3393	12
PINALB_20	1	2013	286082	4173212	55	3105	12
PINALB_21	2	2014	284547	4213602	250	2890	16
PINALB_22	2	2013	303861	4191215	248	3213	12
PINALB_24	2	2013	296891	4175231	14	3098	18
PINALB_25	2	2013	293052	4208800	206	2893	12
PINALB_26	2	2013	300265	4196210	194	3008	18
PINALB_31	2	2014	292132	4186649	135	3279	25
PINALB_32	2	2014	282831	4220099	315	2916	18
PINALB_35	2	2014	300685	4188869	230	3089	24
PINALB_36	2	2014	286581	4174238	240	3367	21
PINALB_38	2	2014	302534	4193310	45	3139	8
PINALB_40	2	2014	296396	4178608	180	3356	10
PINALB_41	2	2016	292441	4201018	330	3020	20
PINALB_42	3	2014	301791	4196147	270	2975	12
PINALB_43	3	2014	294453	4183421	270	3103	23
PINALB_44	3	2017	276322	4225923	270	3103	15
PINALB_46	3	2017	298835	4187794	330	2904	15
PINALB_51	3	2015	302369	4185092	170	3185	10
PINALB_52	3	2011	294465	4174505	240	3041	7
PINALB_53	3	2011	280561	4217535	200	2853	10
PINALB_54	3	2011	297246	4199696	128	3231	9
PINALB_55	3	2017	294242	4198696	45	3018	12
PINALB_56	3	2017	287430	4166349	160	3168	15
PINALB_60	3	2017	267368	4220379	160	2874	10

Table S2. Location and site characteristics for the foxtail pine sample frame in Sequoia and Kings Canyon National Parks, CA, USA (n = 31). Location coordinates (Easting, Northing) are in UTM NAD83, zone 11N.

Plot ID	Panel	Est. Year	Easting	Northing	Aspect (°)	Elevation (m)	Slope (°)
PINALB_2	1	2014	345651	4118343	240	3369	7
PINALB_3	1	2015	374530	4075808	275	3230	14
PINALB_4	1	2015	375909	4084188	272	3286	10
PINALB_5	1	2015	372907	4093446	160	3358	15
PINALB_11	1	2015	372573	4075346	82	3322	30
PINALB_12	1	2014	357557	4083750	230	3236	15
PINALB_13	1	2015	360381	4105785	18	3344	27
PINALB_15	1	2015	368275	4091575	110	3279	25
PINALB_18	1	2013	343283	4112827	230	3423	19
PINALB_20	1	2013	361155	4084009	110	3242	4
PINALB_24	2	2013	358026	4089119	322	3030	5
PINALB_25	2	2013	365621	4094633	168	3277	17
PINALB_27	2	2013	367661	4072341	70	3268	24
PINALB_28	2	2013	361949	4091581	295	3153	20
PINALB_31	2	2013	368793	4083219	330	3224	17
PINALB_33	2	2014	339897	4121834	172	3542	10
PINALB_38	2	2014	346720	4094780	172	3254	31
PINALB_43	2	2014	372447	4072712	230	3611	33
PINALB_44	2	2014	360112	4088754	306	3238	10
PINALB_45	2	2014	347366	4115429	0	3024	5
PINALB_48	2	2014	347886	4081797	138	3133	30
PINALB_49	2	2014	367097	4094696	220	3372	7
PINALB_51	3	2014	376111	4070297	230	3333	13
PINALB_52	3	2017	364847	4084027	270	3166	35
PINALB_58	3	2017	372708	4063454	300	3344	10
PINALB_59	3	2017	372497	4091320	230	3378	17
PINALB_66	3	2017	358738	4091090	300	3184	7
PINALB_68	3	2017	358068	4082392	220	3151	15
PINALB_73	3	2017	360258	4093015	80	3150	25
PINALB_74	3	2017	369157	4073616	275	3552	30
PINALB_78	3	2017	355533	4082622	0	3335	5

Table S3. Location and site characteristics for the Sequoia and Kings Canyon National Parks, CA, USA foxtail pine sample frame (n = 33). Location coordinates (Easting, Northing) are in UTM NAD83, zone 11N.

Plot ID	Panel	Est. Year	Easting	Northing	Aspect (°)	Elevation (m)	Slope (°)
PINBAL_1	1	2015	355122	4029381	308	3080	26
PINBAL_2	1	2011	375721	4039069	206	3018	6
PINBAL_3	1	2015	363289	4043329	240	3256	26
PINBAL_5	1	2015	370617	4026165	20	3140	18
PINBAL_6	1	2011	376988	4042810	226	3060	23
PINBAL_7	1	2011	374789	4056572	170	3456	5
PINBAL_9	1	2011	377826	4033520	38	3353	30
PINBAL_10	1	2011	380915	4038349	340	3234	4
PINBAL_11	1	2011	375675	4050116	340	3085	28
PINBAL_16	1	2013	356739	4061068	76	3060	20
PINBAL_17	1	2013	355948	4031543	101	3074	26
PINBAL_18	2	2013	375967	4045554	280	3059	15
PINBAL_19	2	2013	379846	4047488	323	3318	22
PINBAL_21	2	2013	375557	4032343	294	3088	19
PINBAL_22	2	2013	380284	4042853	100	3390	21
PINBAL_23	2	2013	374094	4056105	141	3490	15
PINBAL_24	2	2016	361953	4059325	240	3018	20
PINBAL_25	2	2013	369054	4032210	45	3127	22
PINBAL_26	2	2016	371357	4046768	15	3353	10
PINBAL_27	2	2013	372176	4051432	20	3323	27
PINBAL_29	2	2013	364439	4034149	225	3248	21
PINBAL_30	2	2014	371006	4042667	190	3398	13
PINBAL_31	2	2014	386287	4038225	315	3396	10
PINBAL_33	3	2014	384714	4036309	135	3396	17
PINBAL_35	3	2014	377887	4048446	225	3386	27
PINBAL_36	3	2014	373289	4057861	280	3502	16
PINBAL_37	3	2014	376739	4029729	315	3242	22
PINBAL_38	3	2014	376735	4036915	0	3099	20
PINBAL_39	3	2014	375604	4053148	270	3443	11
PINBAL_40	3	2014	371733	4071478	342	3158	19
PINBAL_41	3	2014	367280	4034622	135	2887	10
PINBAL_43	3	2017	382685	4040573	280	3418	30
PINBAL_44	3	2017	373659	4077444	50	3108	30