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## Appendix 1

Potential abiotic and biotic predictor variables used to model marten habitat in summer and winter in Lassen National Forest, California.

Predictor			
type	Predictor	Description	Data source
Climate	PRISM	Average annual precipitation (mm ×100), 1971–2000	PRISM, 30 arc-second (resampled to 30 m), 2006
	SNOWDPTH	Maximum mean daily snowdepth (meters / 1000.00), Jan – March 2005	National Snow and Ice Data Center, National Operational Hydrologic Remote Sensing Center Snow Data Assimilation System (SNODAS): Daily Snow Depth (modeled

			snow layer thickness), 30 arc-second (resampled to 30m), 2005
Topography	ELEV	Elevation (m)	USGS 1-Arc Second National Elevation Dataset, 2009
	PCTSLOPE	Percent slope	USGS 1-Arc Second National Elevation Dataset, 2009
Linear features	MJRRDDIST	Distance to nearest major road (primary roads, secondary roads, ramps)	US Census Bureau TIGER, California Major Roads, 2007
	LOCRD_DENS	Local road density (km km <sup>-2</sup> ) calculated with a 270-m radius	US Census Bureau TIGER, California Major Roads, 2007
	ALLRDDENS	Major and local road density (km km <sup>-2</sup> ) calculated with a 270-m radius	US Census Bureau TIGER, California Major Roads, California Local Roads, 2007
	ALLRDDIST	Distance to nearest major or local road	US Census Bureau TIGER, California Major Roads, California Local Roads, 2007
	STRMDEN	Perennial stream density (km km <sup>-2</sup> ) calculated with a 270-m radius	U.S. National Atlas, Water Feature Lines, 2008
	WATERDIST	Distance to nearest perennial stream or water body	U.S. National Atlas, Water Feature Lines,

			2008; USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, WaterBodies07_2, 2008
Cover type	DIST_MTNMDW	Distance to nearest WHR type = wet meadow, perennial grassland, or annual grassland with elevation >= 1400 m	USGS, 1-Arc Second National Elevation Dataset, 2009; Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009
	MTN_MDW	WHR type = wet meadow, perennial grassland, or annual grassland with elevation >= 1400 m.	USG, 1-Arc Second National Elevation Dataset, 2009; Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009
	RFR	WHR type = red fir	USGS 1-Arc Second National Elevation Dataset, 2009; Combination of Ward

		Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009
LPN	WHR type = lodgepole pine	USGS 1-Arc Second National Elevation Dataset, 2009; Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009
FORTYPE	WHR type = white fir, lodgepole pine, red fir, or subalpine conifer	Combination of Ward Assoc. and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009
CWHR	Marten CWHR rating (arithmetic mean of REPRO, FEEDING, COVER)	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab,

	KHREPRO	CWHR reproduction rating = High modified by Kirk and Zielinski (2009)	Existing Vegetation tiles, 2005–2009; CWHR Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009; CWHR
Size and density	STRUCT	Structure score, product of the following: CWHR habitat indicator variable (1 = white fir, lodgepole pine, red fir, or subalpine conifer, 0 otherwise); Forest canopy closure (centroid of class interval: S (10-25) = 17.5, P (25 – 35) = 30, M (40-60) = 50, and D (> 60) = 80)); Tree size (centroid of class interval: 1 (0 – 1) = 0.5, 2 (1 – 6) = 3.5, 3 (6 – 11) = 8.5, 4 (11 – 24) = 17.5, 5 (> 24) = 24, and 6 (multilayered trees) = 37)	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009

	DLFOR	WHR type = white fir, lodgepole pine, red fir, or subalpine conifer AND WHR Density = D AND WHR size = 4, 5, or 6	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009
	MDLG_RFR	WHR type = red fir AND WHR Density = M or D AND WHR size = 4, 5, or 6	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009
	MDLG_LPN	WHR type = lodgepole pine AND WHR Density = M or D AND WHR size = 4, 5, or 6	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009
	MDLG_FOR	WHR type = lodgepole pine or red fir AND WHR Density = M or D AND WHR size = 4, 5, or 6	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009
Historic /	FIRE_OLD	Areas burned before 1992	USDA Forest Service - Pacific Southwest

human /  
management

PLANTATION      Plantations (ORIGIN\_YEAR < 1992)

Region - Remote Sensing Lab, Fire History  
(CA\_R5\_FireHistory08\_3), 2009

Combination of Ward Assoc. and USDA  
Forest Service - Pacific Southwest Region -  
Remote Sensing Lab, Existing Vegetation  
tiles, 2005–2009

HARVEST            Areas harvested from 1990 to 1991

USDA Forest Service - Pacific Southwest  
Region - Regional Office, FACTS  
Accomplished Harvest Activities  
(FACTS\_AccompHarv90\_05\_v1), 2006

HUMAN              Human use areas – 400m buffer around all roads,  
trails, urban areas, and developed recreation areas

Combination of Ward, Vestra, Evveg tiles;  
Tiger 2007; DevelopedRecreation06\_2;  
LnTransportation

WILD\_IRA           National Wilderness Areas and Inventoried Roadless  
Areas

USDA Forest Service - Pacific Southwest  
Region - Regional Office, Wilderness, 2009;  
USDA Forest Service - Geospatial Service  
and Technology Center (GSTC), Inventoried

			Roadless Areas (InventoriedRoadlessArea00_1), 2009
Landscape arrangement	AREA_MN	Mean area of patches of CWHR reproduction rating = High (modified by Kirk and Zielinski 2009)	Combination of Ward Assoc. (in process), Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009; CWHR; FRAGSTATS
	PLAND	Percent of landscape classified as CWHR reproduction rating = High (modified by Kirk and Zielinski 2009)	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009; CWHR; FRAGSTATS
	GYRATE_AM	Area-weighted mean radius of gyration (measure of patch extent and landscape connectivity) of CWHR reproduction rating = High (modified by Kirk and Zielinski 2009) patches	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009; CWHR; FRAGSTATS



NP	Number of CWHR reproduction rating = High (modified by Kirk and Zielinski 2009) patches	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009; CWHR; FRAGSTATS
CORE_AM	Area-weighted mean core area of CWHR reproduction rating = High (modified by Kirk and Zielinski 2009) patches (edge depth = 50 m)	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009; CWHR; FRAGSTATS
NDCA	Number of disjunct core areas of CWHR reproduction rating = High (modified by Kirk and Zielinski 2009) patches (edge depth = 50 m)	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009; CWHR; FRAGSTATS
PROX_AM	Area-weighted mean proximity index, quantifying spatial context of CWHR reproduction rating = High	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific

	(modified by Kirk and Zielinski 2009) patches in relation to neighbors	Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009; CWHR; FRAGSTATS
IJI_KREP_MDW	Interspersion and juxtaposition index, quantifies the juxtapositioning of CWHR reproduction rating = High (modified by Kirk and Zielinski 2009) patches with patches of mountain meadows (WHR type = wet meadow, perennial grassland, or annual grassland with elevation $\geq 1400$ m)	Combination of Ward Assoc., Vestra Co. (2004), and USDA Forest Service - Pacific Southwest Region - Remote Sensing Lab, Existing Vegetation tiles, 2005–2009; CWHR; FRAGSTATS