

Rallus obsoletus obsoletus

California Ridgway’s Rail

California Department of Fish and Wildlife
Range and Distribution Mapping and Analysis Project (RADMAP)
Species Habitat Model (SHM) assessment metrics and metadata

Star Rating: 5 out of 5

Date: 2026-08-28

This metadata describes the SHM results for this one taxon. Methods were developed by the RADMAP team and implemented with Maxent. Evan Greenspan was the primary modeler for this species.

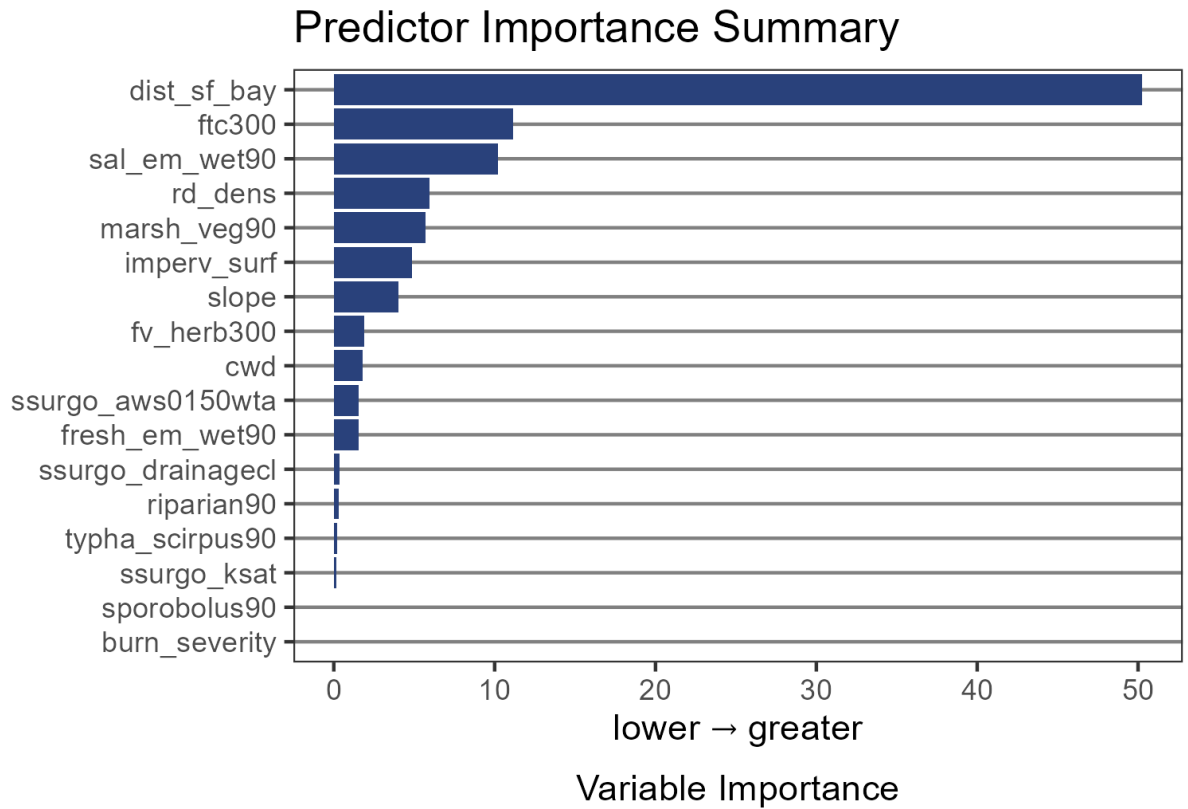
Model Results

Table 1. Maxent model testing results, including the number of filtered presence locations used (Presence), regularization multiplier (RM), feature class (FC), p0 test omission error rate (OER), test area under the curve (AUC), difference between AUC test and AUC training values (AUCdiff), p0 threshold (Threshold) distinguishing habitat from non-habitat, and max(se+sp) test True Skill Statistic (TSS).

Presence	RM	FC	AUC	AUCdiff	Threshold	TSS	OER
794	3	lpqht	0.9177174	0.03818797	P0	0.7196	0

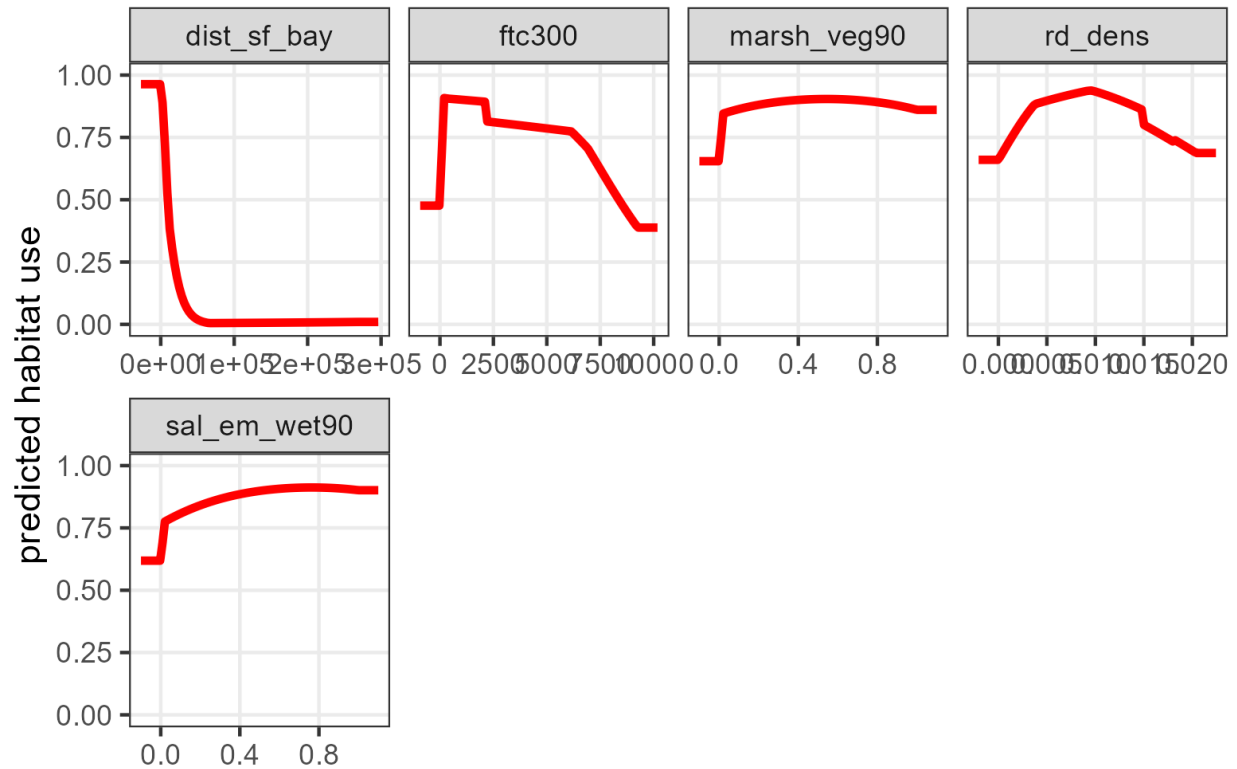
Percent Contribution of Covariates

Figure 1. Estimates of the relative percent of contributions (variable importance %) of covariate inputs to the top Maxent model. Covariates are defined in Table 4.



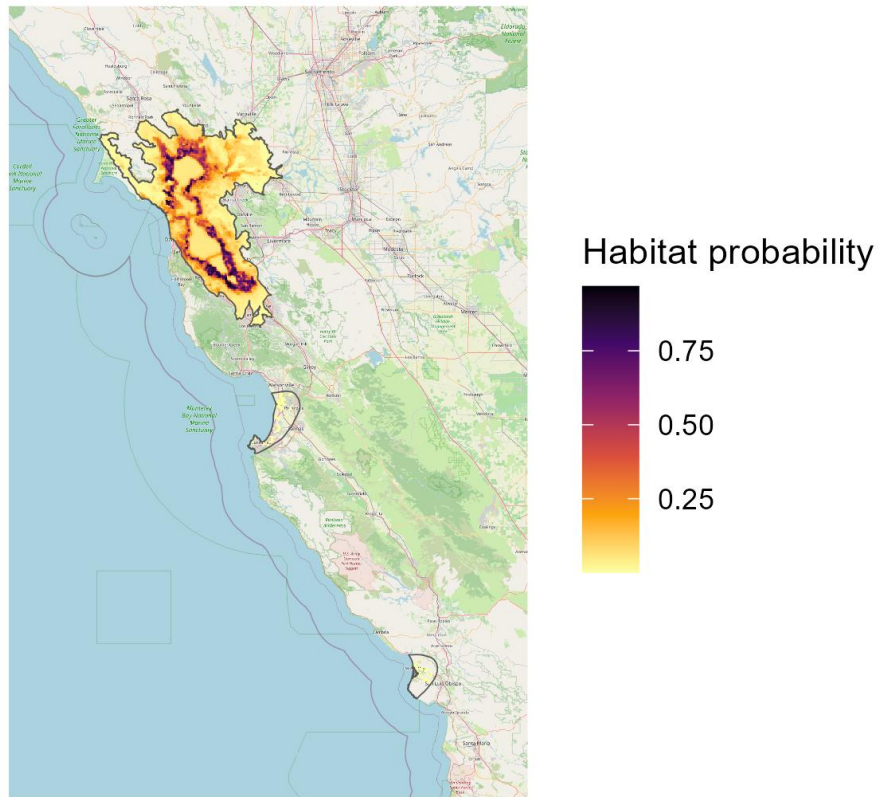
Response Curves

Figure 2. Response curves reveal how the predicted habitat use (0–1 on the y-axis) changes as each variable is altered while all other predictors remain constant. The x-axis represents the covariate's range of values while the y-axis represents the effect between the variable and the model response. Covariates are defined in Table 4.



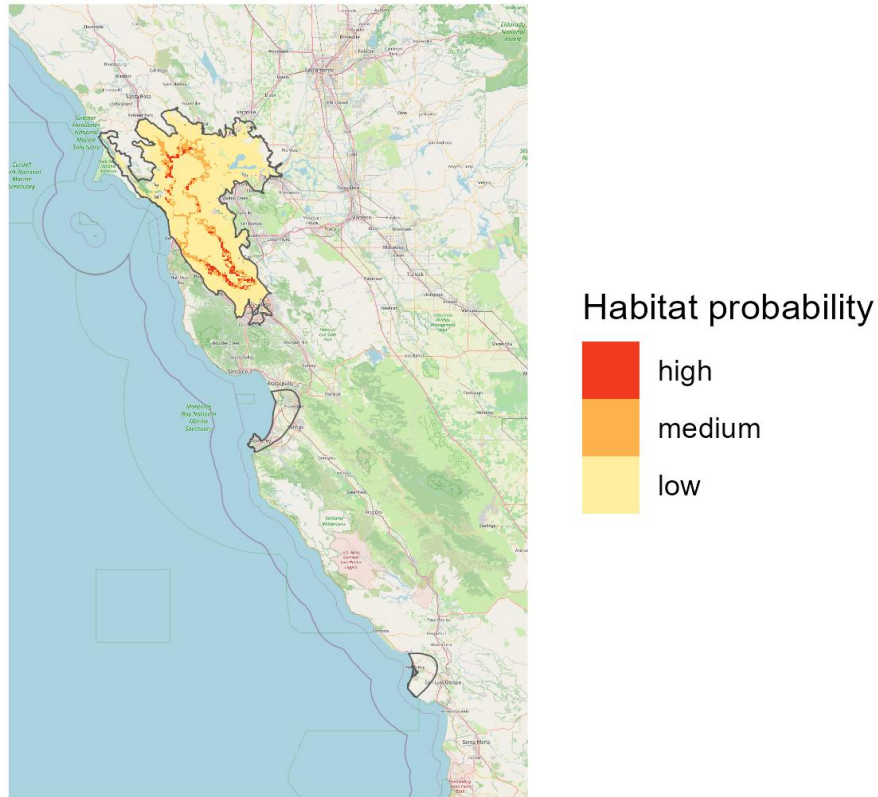
Model Output – Species Habitat Model (continuous)

Figure 3. SHMs depict a species' predicted habitat associations within each cell, represented as a continuous value between 0 and 1, and masked to the species' range. Values closer to 1 depict a higher relative probability of habitat use within that cell.



Model Output – Species Habitat Model (categorical)

Figure 4. The categorical SHM is based on the continuous SHM output. It splits the model output into predicted habitat and non-habitat based on a statistical threshold (p_0). Within the area marked as predicted habitat in the output, this map displays the categories of high, medium, and low relative probability of habitat use. Medium and high relative probability of habitat use categories were distinguished based on expert chosen statistical thresholds.



Categorical SHM Thresholds

Table 2. Statistical thresholds chosen to represent the categorical SHM.

Category	Threshold Selected	Threshold Value
low	Minimum Training Presence	0.0165900
medium	Maximum Sensitivity Plus Specificity	0.2081600
high	Top 25% of habitat probability values above medium threshold	0.5539668

Model Evaluation

Table 3. The final model evaluation score, represented as a star rating (1-5) is presented at the top of this metadata. Star ratings are comprised of three distinct components, including an expert review, a modeler review, and an AUC score. Experts review models based on predictor relevance and the overall accuracy of the continuous and categorical SHM outputs. Modelers provide a review of presence data, predictor relevance, performance evaluation, spatio-temporal data alignment, model review status, and the overall accuracy of the continuous and categorical SHM outputs. Along with the AUC score, these three inputs are normalized and given an equal weight before being converted into a categorical star rating. The table below provides a basic descriptive meaning of the star rating provided for this model, taking into account the subjective expert and modeler review scores as well as the objective AUC evaluation.

Star Rating	Brief Description
1	Poor representation of habitat. Habitat for this species is unlikely to be successfully mapped using standard habitat modeling approaches given unique species traits.
2	Significant concerns. A large proportion of the map shows habitat in areas where the species is unlikely to occur or does not predict habitat where the species is known. Revisions are needed before the model is used for any formal application or decision, with the possible exception of guiding inventory.
3	Some concerns about model performance in specific areas. The model would benefit from additional refinement, but the general pattern of mapped habitat is consistent with expert expectations
4	Model generally good. Potential for further improvement through additional iteration but provides a good approximation of likely habitat.
5	Modeled habitat is a very good representation of likely habitat. Further iteration is unlikely to result in significant improvements.

Covariate Descriptions

Table 4. Descriptions of environmental variables included in model. Covariates were chosen for inclusion in the model based on a literature review, their potential for ecological relevance to the focal taxon, and advice from applicable experts. Focal statistics were calculated for certain habitat covariates at the 90, 300, 900, 3,000, and 6,000-m radii scales to assess species' scale dependency. Only one covariate per set of scales were included in the covariate candidate set. Other covariates were extracted at the raster cell's resolution (30-m) unless otherwise specified.

The entire covariate library including full citations is available here:

<https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=232517>

Covariate Name	Covariate Description	Source
burn_severity	Burn severity from 1984-2024 at a 90 m radius	MTBS
cwd	Climatic water deficit	USGS Basin Characterization Model
dist_sf_bay	Distance to San Francisco Bay, including North, Central, and South Bay, but not Suisun or the Delta	CDFW
fresh_em_wet90	Freshwater emergent wetlands habitat prevalence at a 90 m radius	Cal Fire FVEG 2022, CDFW, USFWS National Wetlands Inventory 2024, Cal Fire FRAP 2025
ftc300	Fractional tree cover at a 300 m radius	Center for Ecosystem Climate Solutions
fv_herb300	FVEG herbaceous prevalence at a 300 m radius	Cal Fire FVEG 2022
imperv_surf	Impervious surfaces	NLCD-MRLC
marsh_veg90	Marsh vegetation including cordgrass, pickleweed, cattail, bulrush, gumweed, gumplant, and spiny rush at a 90 m radius	CDFW
rd_dens	Road density within a 3 km radius	US Census TIGER/Line data
riparian90	Riparian habitat prevalence at a 90 m radius	Cal Fire FVEG 2022, USFWS National Wetlands Inventory 2024, CDFW, Cal Fire FRAP 2025

Covariate Name	Covariate Description	Source
sal_em_wet90	Saline emergent wetlands habitat prevalence at a 90 m radius	Cal Fire FVEG 2022, CDFW, USFWS National Wetlands Inventory 2024, Cal Fire FRAP 2025
slope	Slope	Digital Elevation Model, USGS Earth Explorer
sporobolus90	California cord grass vegetation at a 90 m radius	CDFW
ssurgo_aws0150wta	Available water storage, 0-150 cm, weighted average	NRCS SSURGO
ssurgo_drainagecl	Drainage class	NRCS SSURGO
ssurgo_ksat	Amount of water that would move vertically through soil	NRCS SSURGO
typha_scirpus90	Emergent marsh vegetation including cattail and bulrush at a 90 m radius	CDFW