

Evaluating the contribution of urban lands to SF Bay Area conservation goals with iNaturalist

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Introduction

- Regional conservation organizations in the San Francisco Bay Area have **not yet recognized** the extent to which **urban lands** provide habitat for target conservation species
- The biodiversity community science platform, **iNaturalist**, demonstrates that many target species are **frequently observed** in urban landscapes
- **Species distribution modeling** (SDM) is a powerful tool for evaluating the habitat of target species and mapping available habitat across urban areas

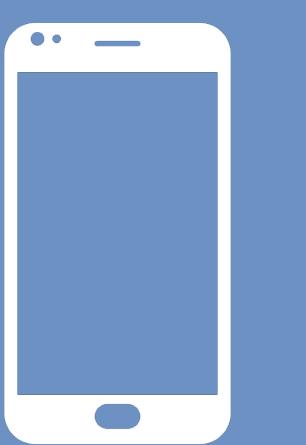
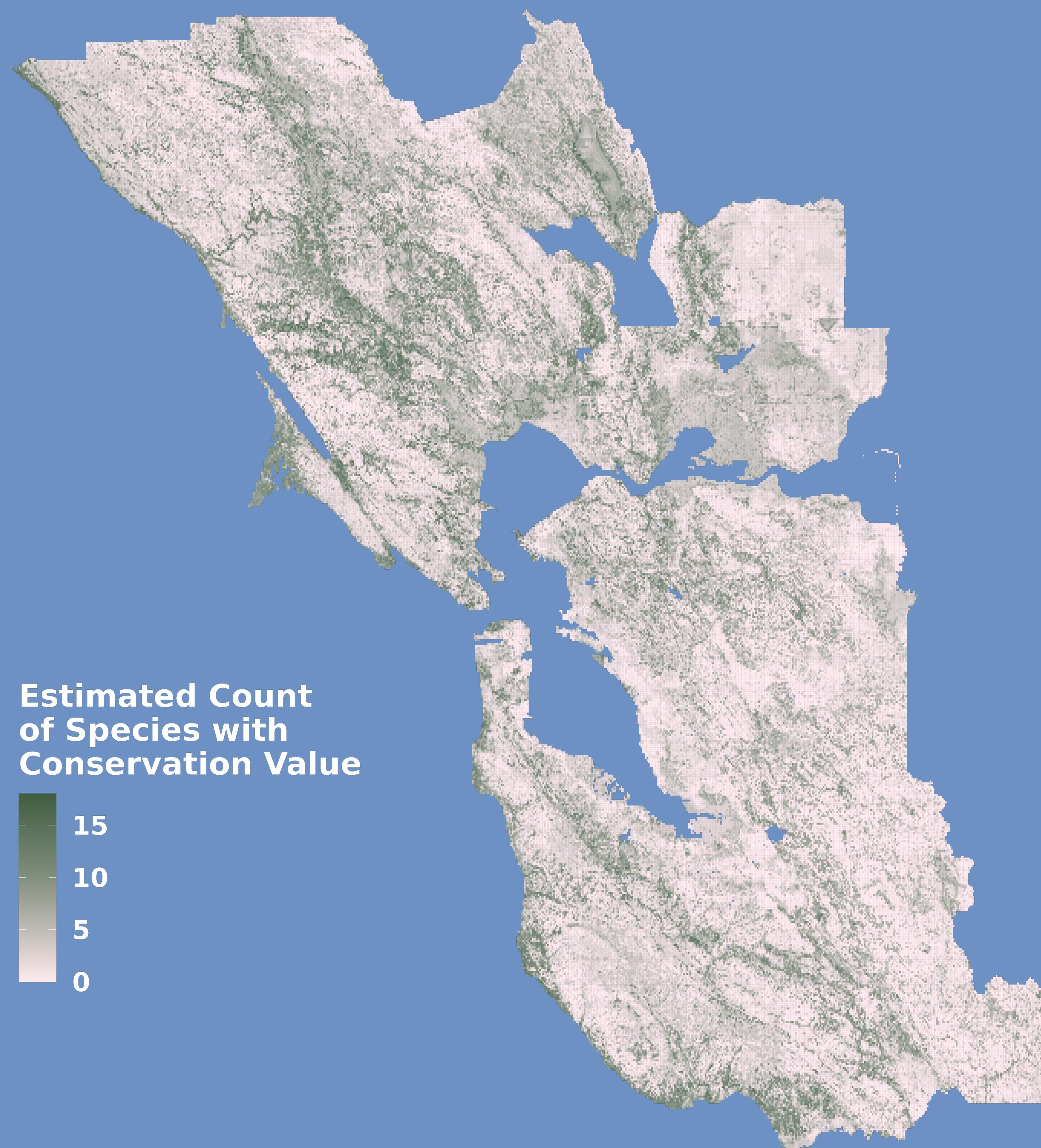
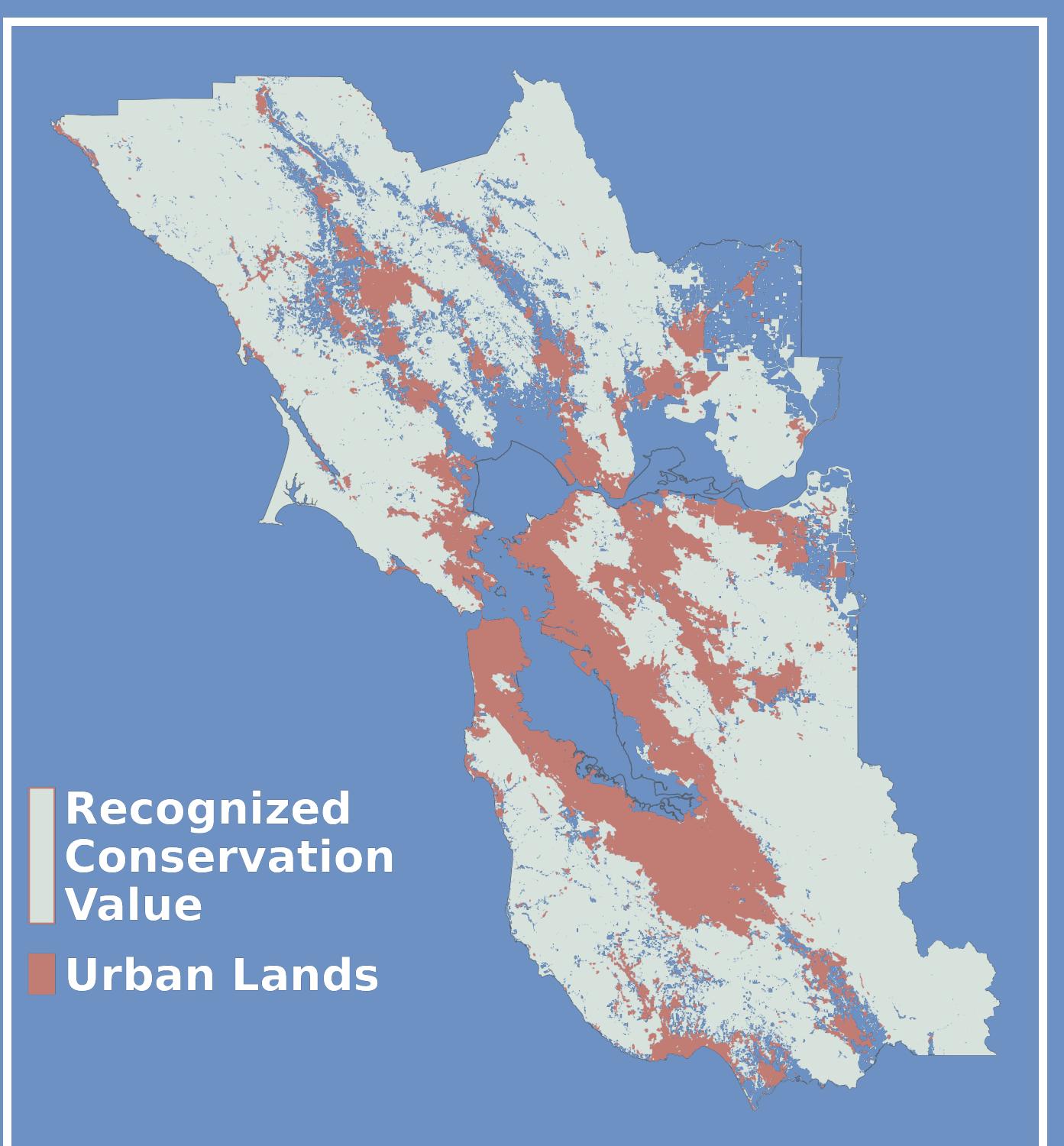
Materials

- 10 San Francisco Bay Area counties
- 1999 - 2023
- 53,000 iNaturalist observations
- 18 species of conservation value
- 18 environmental variables at 10m
- R v4.2.2, SDMTune, blockCV, terra, tidyverse, CoordinateCleaner, sf

Methods

1. Prepare source data
2. Train MaxEnt SDM for each species
3. Validate models with local experts
4. Identify important habitat for target species

iNaturalist data informs regional conservation strategy



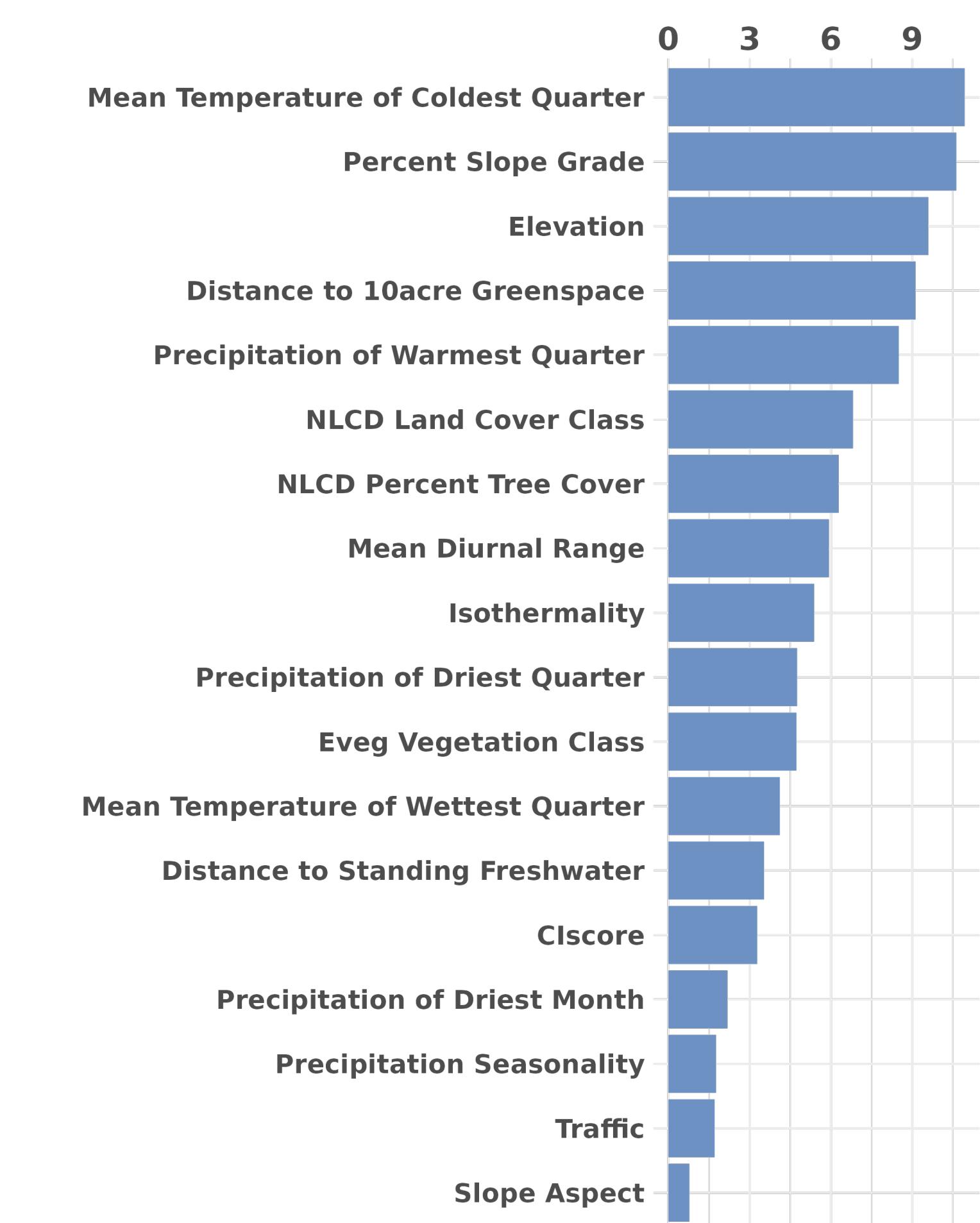
Scan the QR code to view the interactive report we sent to community collaborators

Extended Results

Species with SDM Accuracy Metrics

	Presence Points	AUC	TSS
<i>Aneides lugubris</i>	1815	0.82	0.48
<i>Aphelocoma californica</i>	5902	0.79	0.42
<i>Callipepla californica</i>	2952	0.86	0.56
<i>Canis latrans</i>	3354	0.86	0.54
<i>Chlorogalum pomeridianum</i>	3873	0.85	0.52
<i>Danaus plexippus</i>	3904	0.90	0.64
<i>Elgaria coerulea</i>	506	0.93	0.71
<i>Elgaria multicarinata</i>	1809	0.79	0.43
<i>Helminthoglypta nickliniana</i>	155	0.95	0.77
<i>Juglans hindsii</i>	81	0.94	0.73
<i>Lontra canadensis</i>	602	0.98	0.85
<i>Melanerpes formicivorus</i>	4116	0.86	0.56
<i>Nycticorax nycticorax</i>	3346	0.96	0.78
<i>Sciurus griseus</i>	1375	0.92	0.68
<i>Sialia mexicana</i>	5075	0.84	0.51
<i>Thamnophis elegans</i>	308	0.91	0.66
<i>Thamnophis sirtalis</i>	38	0.97	0.86
<i>Zonotrichia leucophrys</i>	5198	0.89	0.63

Most Important Environmental Variables



Conclusion

- iNaturalist and accessible environmental data can produce informative SDMs
- Many target conservation species in the Bay Area find habitat in urban landscapes
- C*Sci data is an increasingly powerful resource for land managers and conservation practitioners