THE IMPORTANCE OF MONITORING AND MODELING BIRD POPULATIONS TO SUPPORT RIPARIAN MANAGEMENT IN AN URBANIZED/AGRICULTURAL MATRIX IN SOUTHERN CALIFORNIA

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Santa Clara project

Santa Clara River Basin

Santa Clara River project boundary – lower 50 miles

Existing Avian Monitoring Projects

- Population estimates of breeding bird species have been determined regularly since 2010 via point counts and other surveys on 15+ Nature Conservancy properties and one other reserve (the famous "Hedrick Ranch Nature Area"); recruitment and survival have been measured since 2015 via banding on the HRNA
- Breeding productivity and parasitism rates of Least Bell's Vireos have been monitored since 2006 on one reach restored as part of housing development mitigation; since 2015 on 4 restored properties managed with and without Brown-headed Cowbird trapping in support of the USFWS Strategic Habitat Conservation (SHC) program (see Marek et al. talk, this session); and in 2016 & 2017 on one additional property in support of a TNC project to evaluate the efficacy of alternate methods of trapping cowbirds

AVIAN SPECIES ON THE SANTA CLARA RIVER

More than 130 bird species have been documented since 2010 using riparian vegetation along the SCR; at least 100 species breed on the SCR

The relatively high species diversity for a river bounded along much of its length by agriculture and urbanization makes it notable for southern California

Efforts to track demography of avian species on the river and their responses to restoration efforts are crucial for property managers and natural resource agencies

Notable Species on the SCR... The Big 5

Least Bell's Vireo : ~ 500 breeding pairs

>Yellow Warbler: 1000s of pairs

>Yellow-breasted Chat: low hundreds of pairs

Southwestern Willow : <5 known breeding pairs?

>Yellow-billed Cuckoo : unknown # of breeding pairs









Extensive systematic surveys for SWFL and YBCU have not been conducted

Formal surveys for flycatchers and cuckoos have been conducted irregularly, mostly as mitigation monitoring, but have not been conducted throughout the mainstem

To complement the existing SHC Project on vireos, the USFWS and CDFW recently contracted with the authors to conduct a 2-year (2018-2019) field and modeling study

Results will include current breeding distribution and habitat use by both species; habitat availability models; maps of current vegetative conditions; and time-series analyses of habitat and vegetative changes

The Usefulness of Monitoring and Modeling Information

- The data and tools from this SWFL & YBCU study will address multiple partners' needs (e.g., CDFW, USFWS, TNC, Ventura County Watershed Protection District) to manage the species on the SCR, including assisting the evaluation of progress of recovering SWFL and YBCU populations, and addressing effectiveness of restoration actions for these species
- The project will also leverage investments already made into restoring riparian habitat on the SCR -- i.e., more than \$28 million dollars of public funds already spent by the SCC and other state and federal agencies for this purpose

Use published satellite models to predict flycatcher and yellow-billed cuckoo habitat



Open-File Report **2940** Inter Model of Southwestern Willow Flycatcher (*Empidonax traillii extimus*) Breeding Habitat and a Simulation of Potential Effects of Tamarisk Leaf Beetles (*Diorhabda* spp.),

Significant predictor variables in flycatcher model: Roosevelt Lake, AZ

Patch Size

Landsat Thematic Mapper 5



Significant covariates in flycatcher model: Roosevelt Lake, AZ

Digital elevation



Floodplain Size



Calculate NDVI - Riparian Density



Heterogeneity in Riparian Density



Reclassify model output into 5 probability classes: examine accuracy Roosevelt Lake: Salt River delta, AZ



Rangewide Flycatcher Modeling Project



57 Landsat Scenes used in Rangewide Model



Rangewide Model Output in 7.5-Minute Quads Habitat Average: 2013 - 15



Rangewide extrapolation and verification

Predicted Flycatcher Habitat at Havasu National Wildlife Refuge: 5-Probability Class Habitat Map



Base map from USGS The National Map. National Boundaries Dataset, National Heivation Dataset, Giorgraphic Names Information System, National Hydrography Dataset, National Land Cover Datateses, National Structures Dataset, and National Transportation Dataset, U.S. Commu Brusau - TGERT, Inice HER: Read Data





Relationship between drought and rangewideDrought Maps: 2013 - 15flycatcher habitat



http://droughtmonitor.unl.edu

Effects of beetles on Virgin River flycatcher habitat



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A habitat time series of the lower Virgin River: 1986 to 2015



Applying satellite model to Santa Clara River



32-year habitat time series for Southwestern Willow Flycatcher along Santa Clara River calculated with the satellite model



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