

Spatial analysis of Yellow-billed Cuckoo Distribution and Vegetation Coverage Along the Lower Colorado River (LCR-MSCP)



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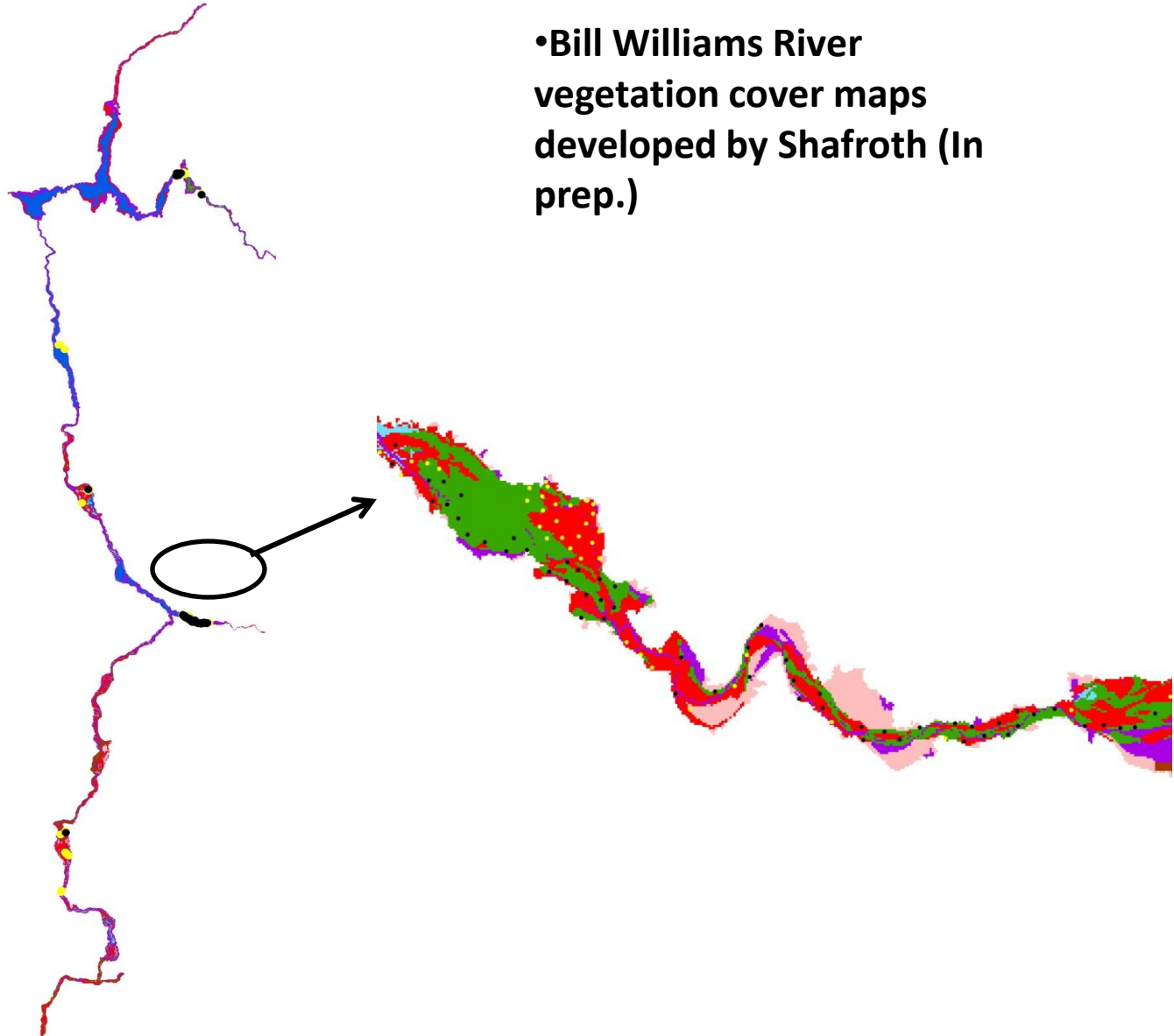
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Study Area

•LCR_veg_2004
spatial data
developed for BoR
prepared by BIO-
WEST, Inc. (2006)

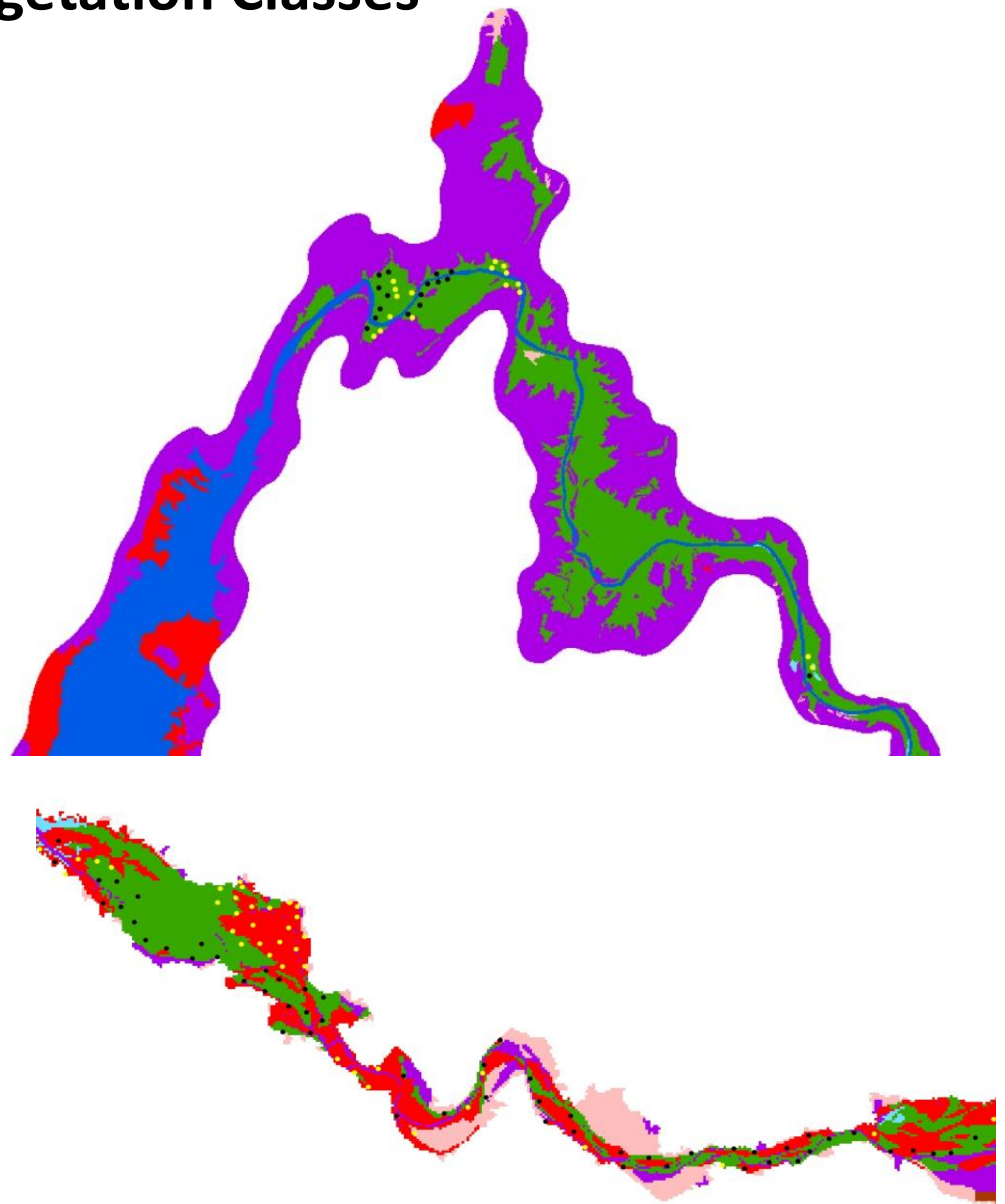
•Bill Williams River
vegetation cover maps
developed by Shafroth (In
prep.)



Re-Classified Vegetation Classes

Finer-scale vegetation types into
7 categories :

-  Salt Cedar
-  Cottonwood-Willow
-  Open water
-  Salt Cedar-Mesquite
-  Agriculture
-  Marsh
-  Other



Study Objectives

- Examine the AREA of each vegetation type within concentric circles of 4.5 to 72 ha and YBCU use in that vegetation type.
- What MAJOR habitat comprises the greatest area within concentric circles.
- Examine the VARIETY (number of vegetation types) within each concentric circles.
- Examine the HETEROGENEITY of vegetation types (standard deviation of Variety) within the concentric circles.



Vegetation Cover Modeling Results

Variables in the equation:

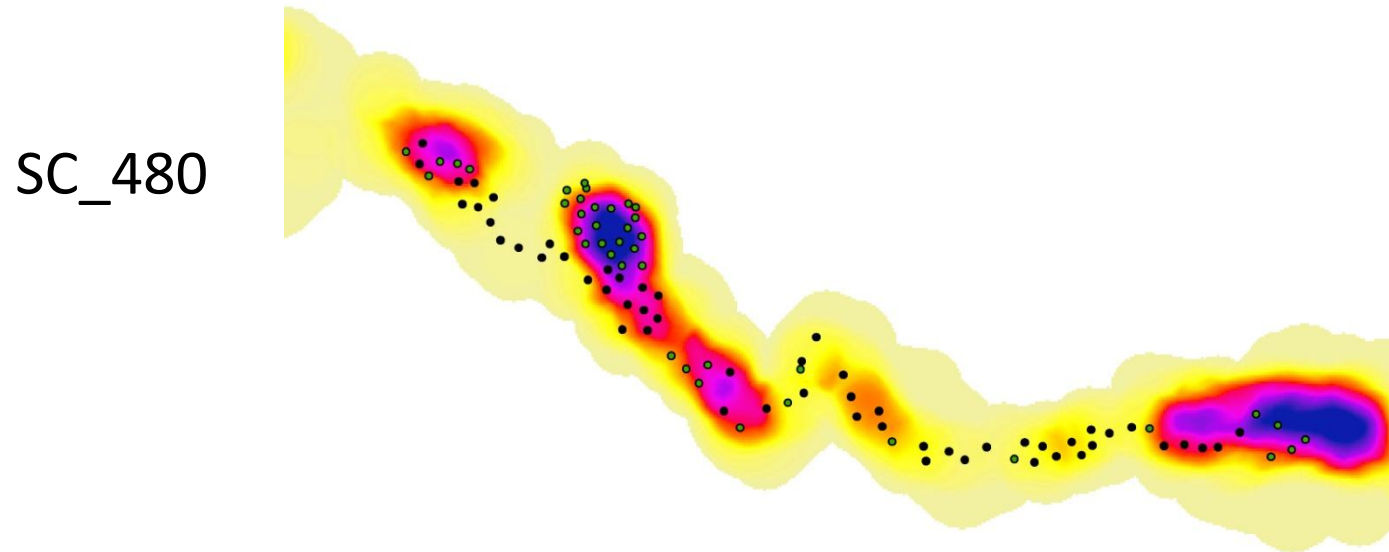
- Open Water- NEGATIVE
- Other- Negative
- Heterogeneity in vegetation cover types- NEGATIVE
- Saltcedar within 480 m radius- NEGATIVE
- Cottonwood-Willow within 480 m radius- NEGATIVE
- Cottonwood-Willow within 120 m radius- POSITIVE



The Vegetation Type multivariate model Results of yellow-billed cuckoo breeding habitat.

Predictor	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I. for EXP(B)	
							Lower	Upper
SC_480	-5.003	1.538	10.585	1	.001	.007	.000	.137
CW_120	2.938	1.213	5.867	1	.015	18.871	1.752	203.270
CW_480	-3.100	1.699	3.330	1	.068	.045	.002	1.258
Open Water	-11.544	5.579	4.282	1	.039	.000	.000	.543
Other	-3.484	1.937	3.234	1	.072	.031	.001	1.367
Heterogeneity	-2.117	0.962	4.838	1	.028	.120	.018	.794
Constant	2.367	0.688	11.822	1	.001	10.661		

Saltcedar within a 480 m radius/72 ha



Likelihood of a Yellow-billed Cuckoo decreased 10% as the amount of saltcedar increases 10% within a 480 Radius

Heterogeneity of Vegetation Types within 480 m radius/72 ha (SD_Var)

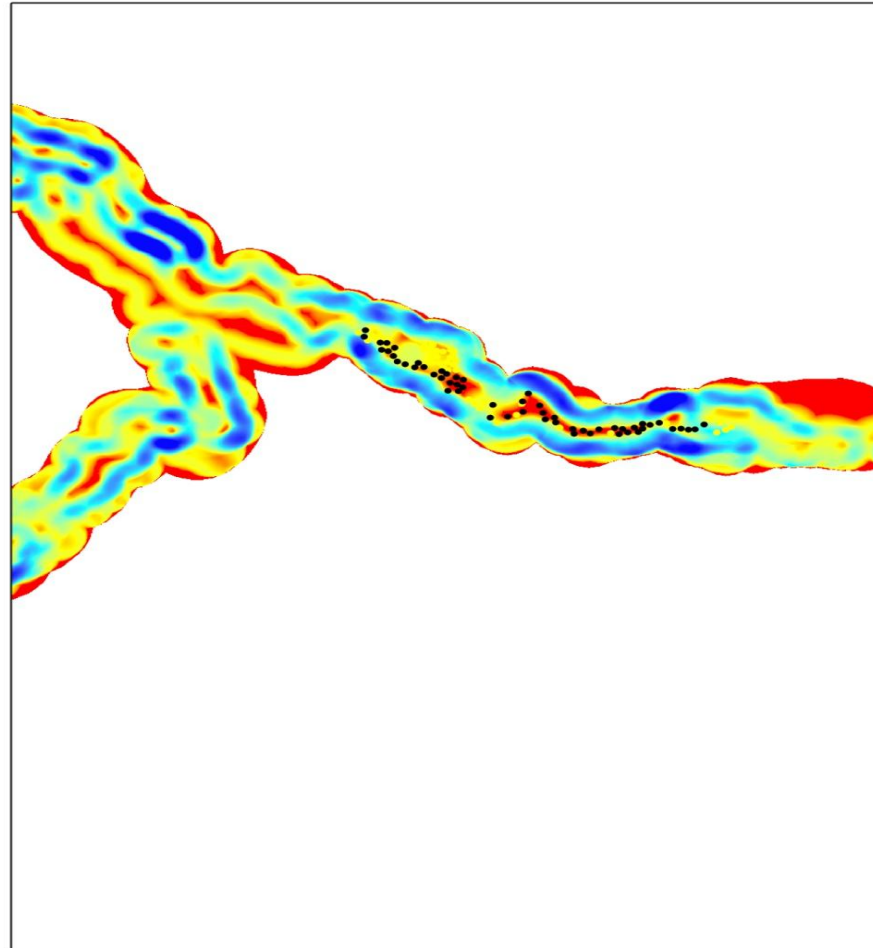
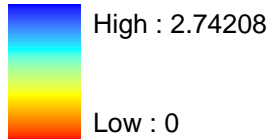
SAMPLE

0

1

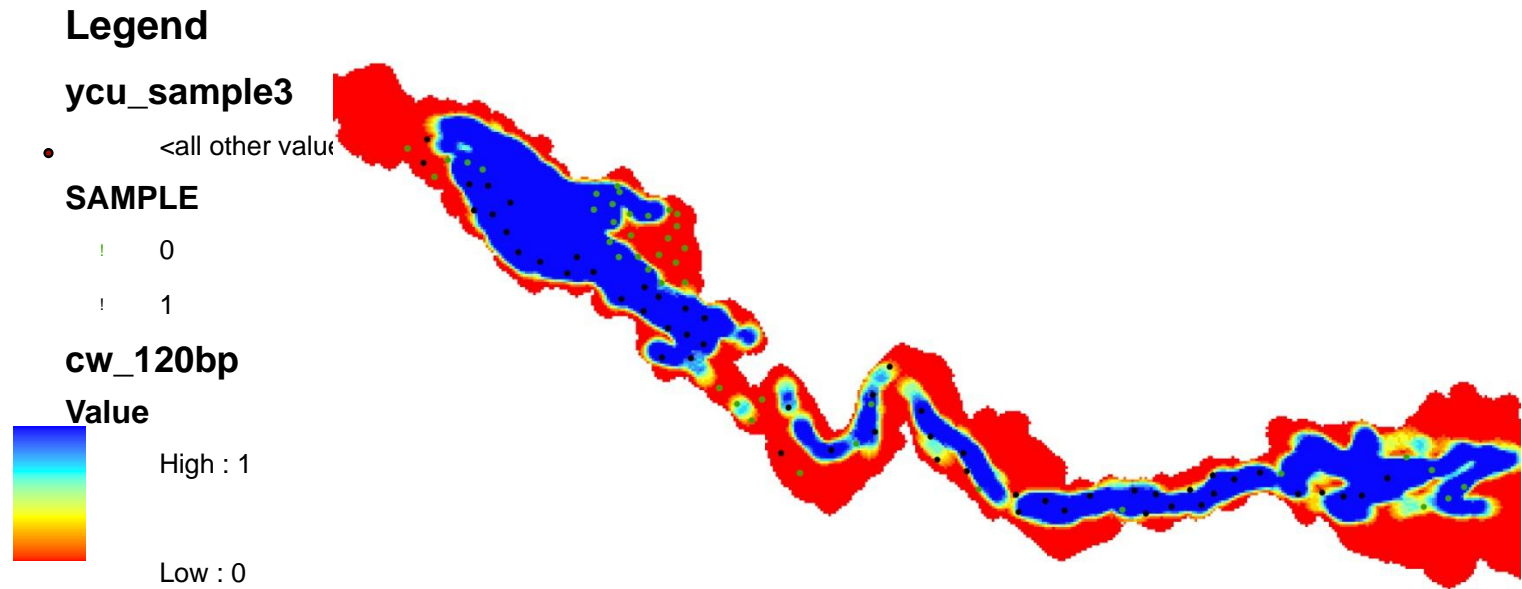
ybcu_SDvar480

Value



Likelihood of a Yellow-billed Cuckoo decreased 88% as heterogeneity increases

Cottonwood/Willow within 120 m radius/ 4.5 ha



Likelihood of a Yellow-billed Cuckoo increased 189% as the area of cottonwood/willow increased within 120 m radius.

Cottonwood-willow vegetation type within a 480 m radius/72 ha

Legend

ycu_sample3

<all other values

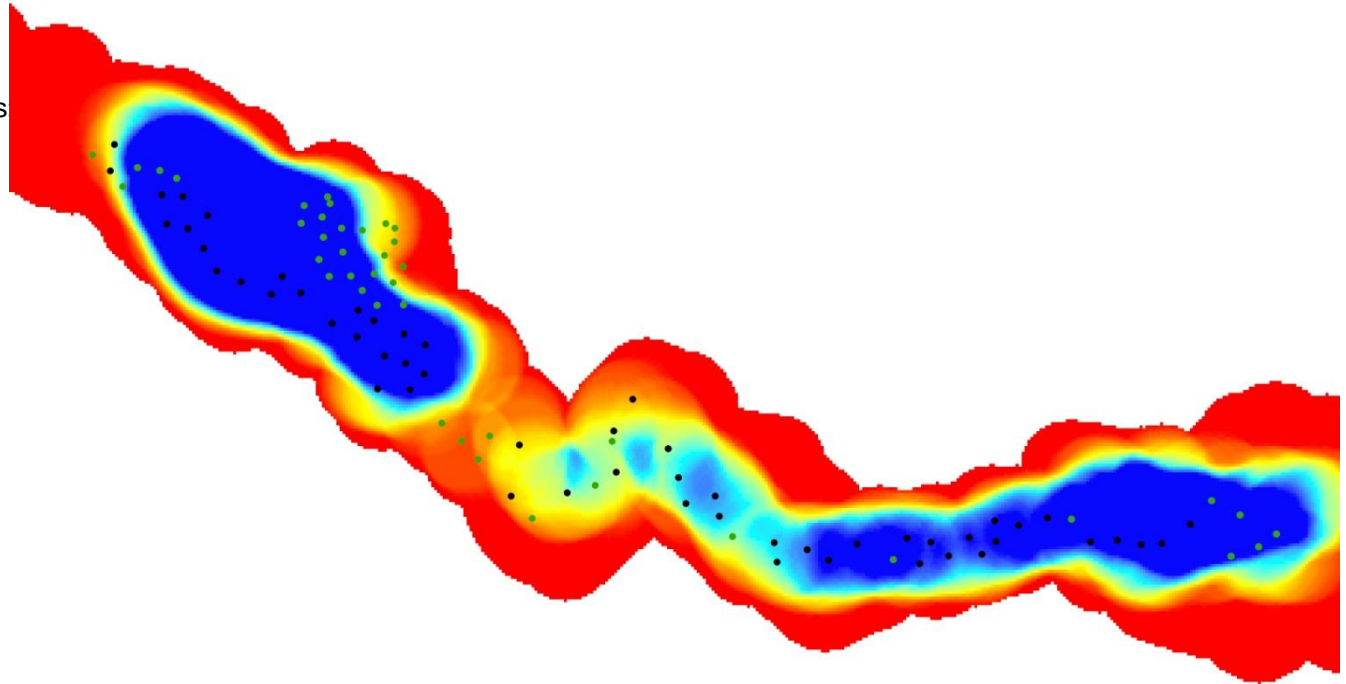
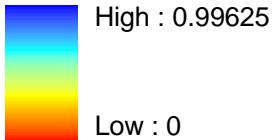
SAMPLE

! 0

! 1

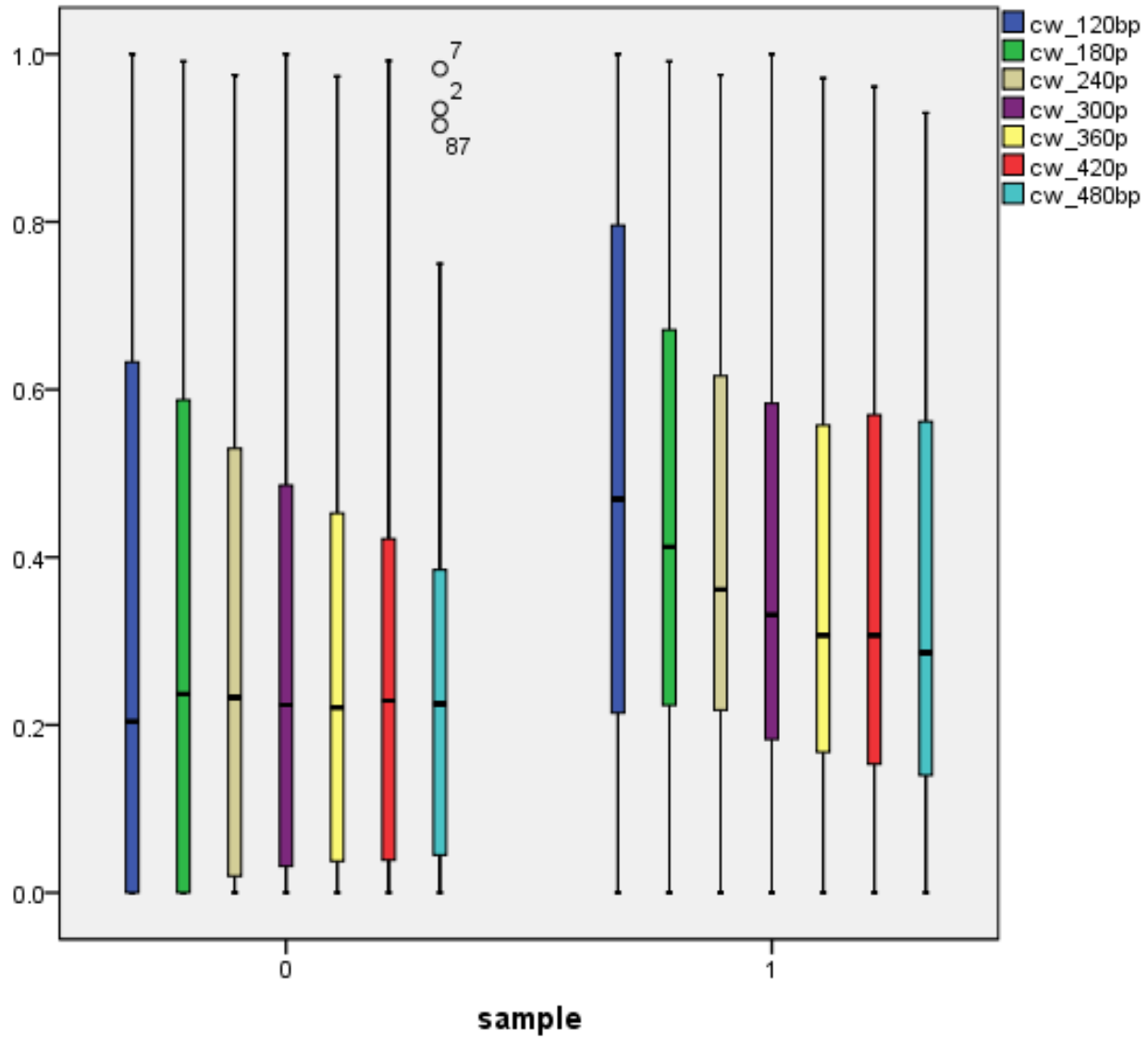
cw_480bp

Value



Likelihood of a Yellow-billed Cuckoo decreased as the area of cottonwood increased within a 480 m radius.

Covariates, in YBCU Nonuse (sample=0) and Use (sample=1) Areas, in LCR-MSCP vegetation type model.



Conclusions

- For each 10% increase in the area of saltcedar vegetation type inside a 480 m radius circle (72 ha), the likelihood of a cuckoo decreased 10%.
- The area of open water was strongly negatively associated with cuckoos in the project area.
- The increase in the heterogeneity (number of vegetation types) within a 480 m radius circle/72 ha, the likelihood of a cuckoo decreased.
- For each 10% (approximately 1/2 ha) increase in area of cottonwood-willow within a 120 m radius circle (4.5 ha), the likelihood of a cuckoo increased.

