Current status of the Flat-tailed Horned Lizard: range-wide trends 2007-2013

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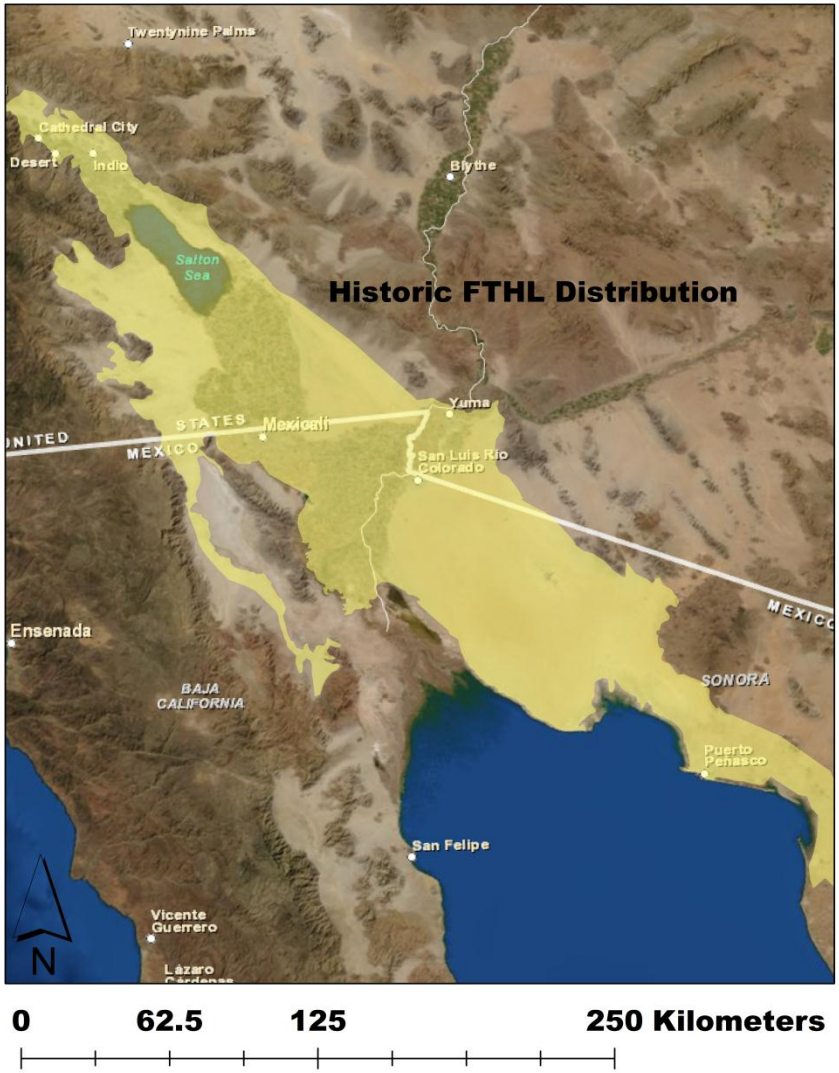
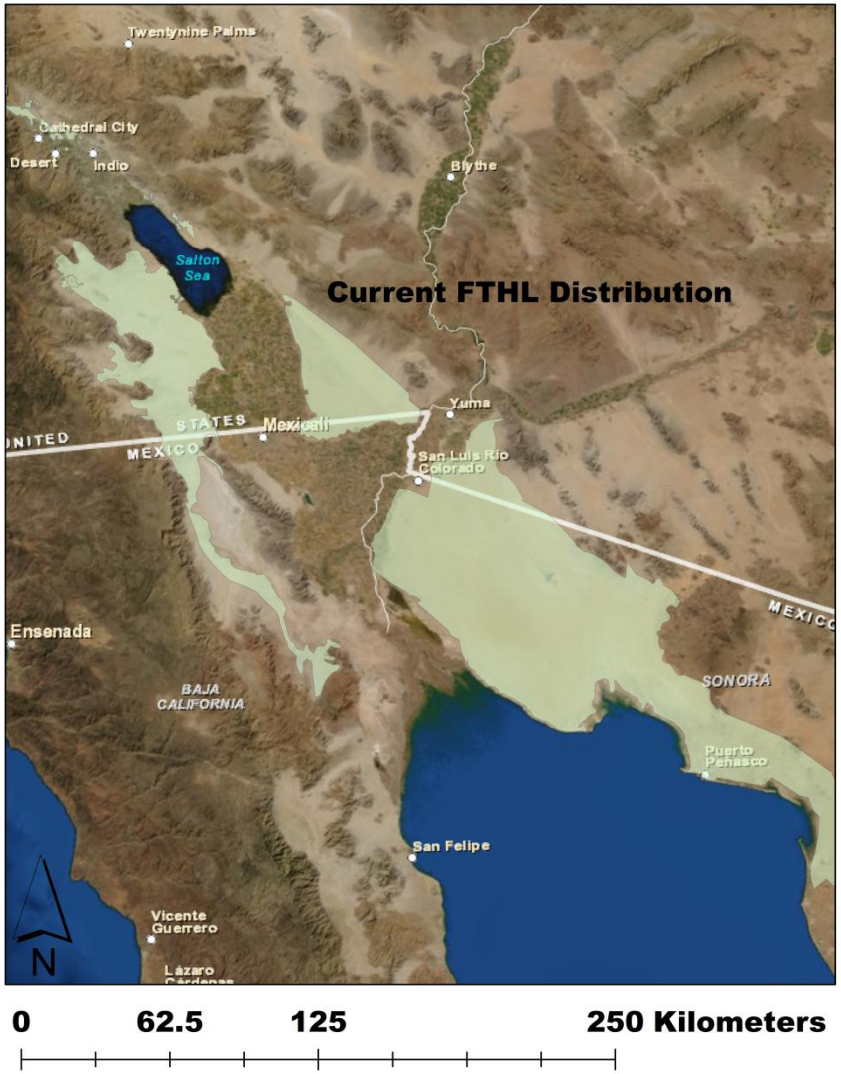
Flat-tailed Horned Lizard ICC

Flat-tailed Horned Lizard
(Phrynosoma mcallii)



Current Distribution

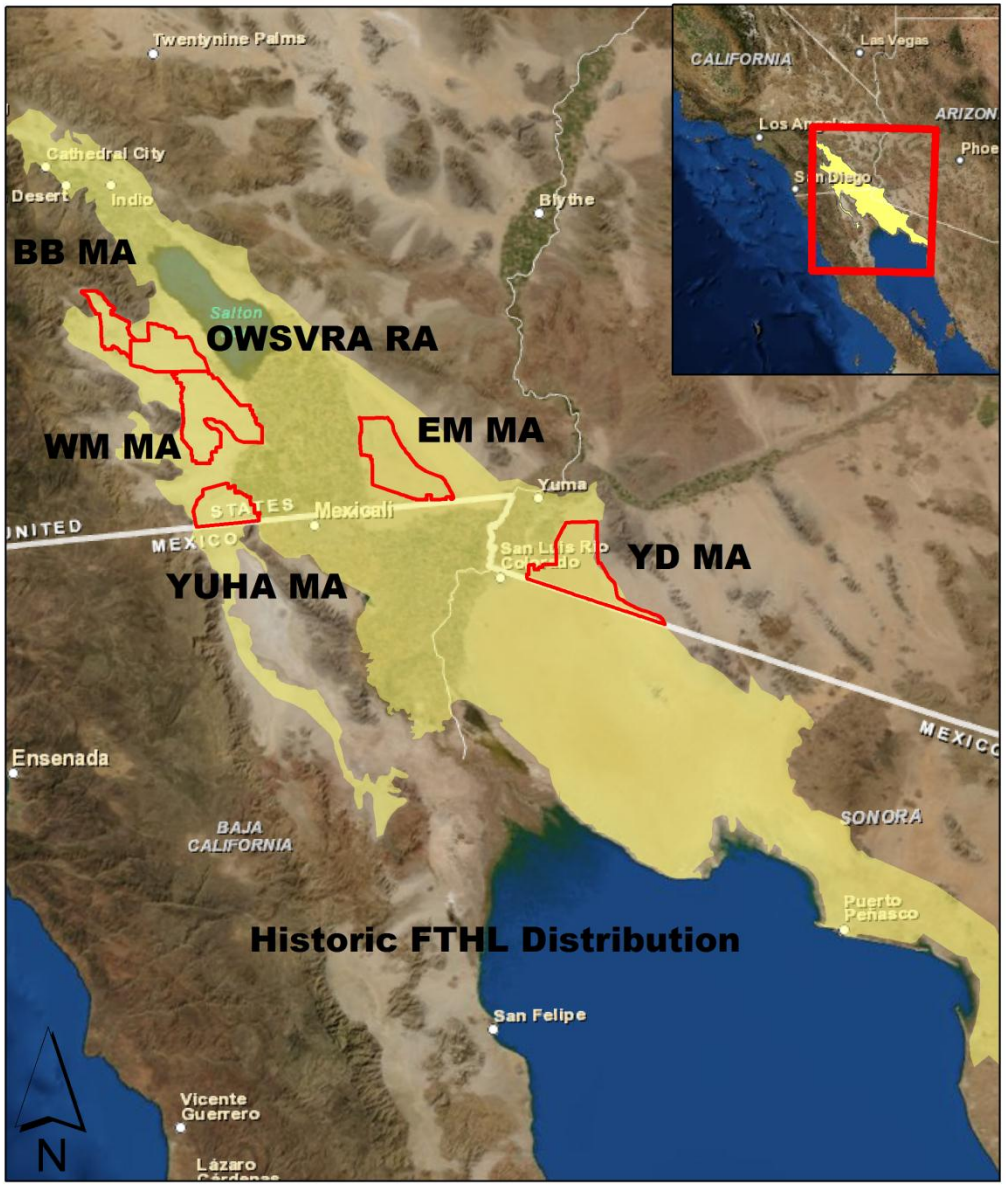
- **~50% reduction in habitat (Rorabaugh and Young 2009)**
- **US FWS has been sued 4 times by groups like CBD and THS**



FTHL – Interagency Coordinating Committee

- **Established in 1994 by an MOU between US FWS, BLM, BoR, DoD, and others.**
- **Developed conservation agreements that would identify specific actions and responsibilities of the signatories**
- **Secure and maintain habitat for self-sustaining populations through establishment of 5 MAs.**

Management Areas



FTHL and the MSCP

- **The LCR MSCP conservation measures for this species are to:**
  - **Acquire and protect 230 acres of existing unprotected FTHL habitat**
  - **Implement conservation measures to limit take**
  - **Avoid impacts from operation, maintenance, and replacement of hydroelectric generation and transmission facilities**

Monitoring

- **Beginning in 2007, methods were standardized**

- **Methods designed to:**
  - **Detect *threats* to survival**
  - **Guide management actions**
  - **Collect information necessary to continually assess the status of the FTHL**

Monitoring (Grant 2008)

- **Implementation**
  - **Demography "two to four plots… surveyed each year" per MA**
    - **Mark-recapture design, 10 days/year, 9 ha plot**
    - **Single season: abundance**
    - **Multi-season: population growth, survival, colonization, extinction**
  - **Occupancy "100-200 plots" per MA**
    - **Single-season: Estimate percent of area occupied based on inaccurate detection probability**
    - **Multi-season: all of the above plus pop. Growth, survival, colonization, and extinction**

Purpose of the MAs:

Maintain a "long-term stable" or increasing population of Flat-tailed Horned Lizards in all MAs. A population that is stable over the long term exhibits no downward population trend *after* the effects of natural demographic and environmental stochasticity are removed.

Effort 2013

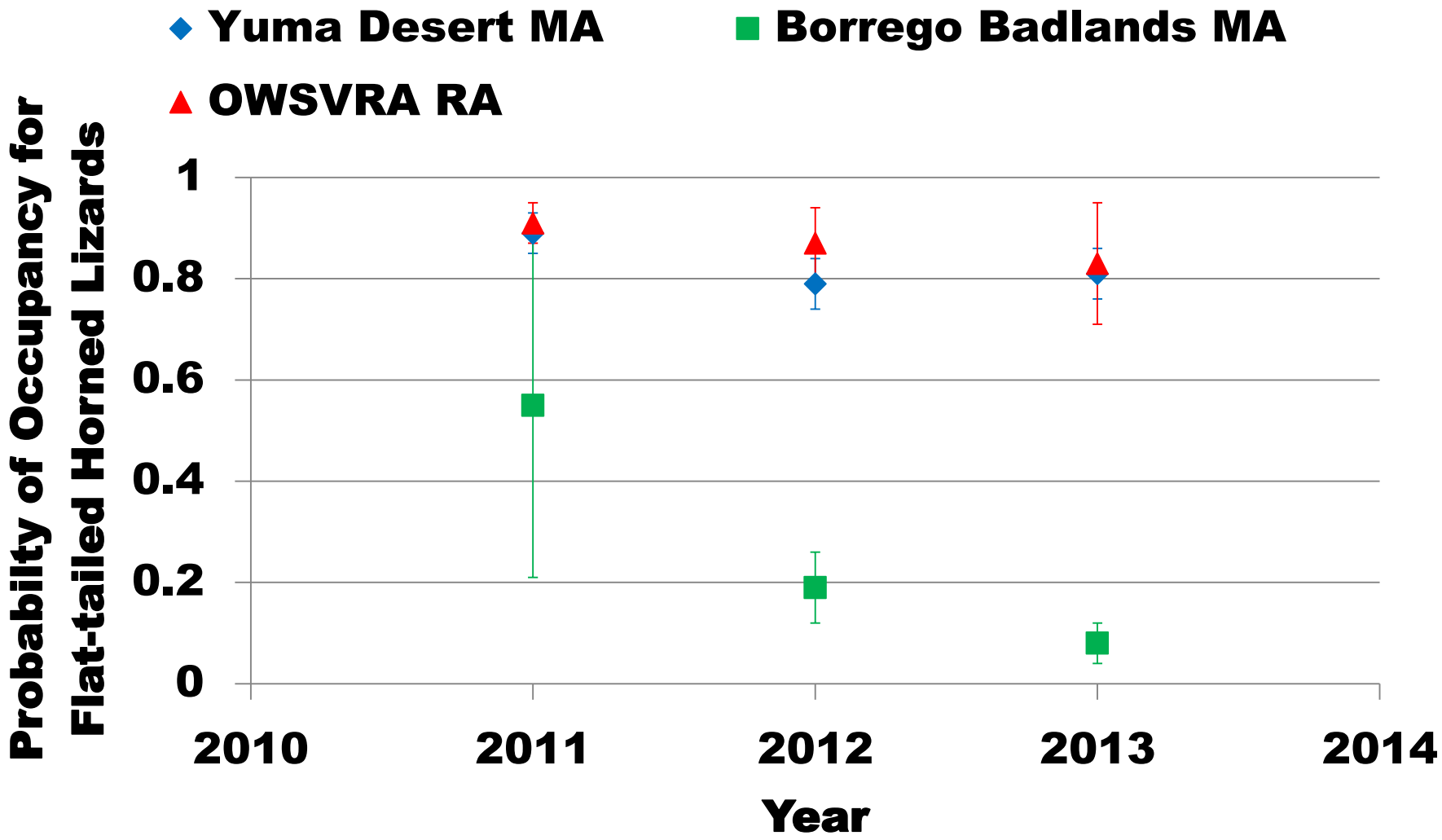
	Method	
Management Area	**Demography Plots[1]**	**Occupancy Plots (surveys)**
Borrego Badlands MA	**n/a**	**52 (5)**
East Mesa MA	**1: EM1**	**n/a**
OWSVRA RA	**n/a**	**50 (6)**
West Mesa MA	**1: NAVY = WM3**	**n/a**
Yuma Desert MA	**2: YD1 & YD2**	**75 (6)**
Yuha Desert MA	**n/a**	**n/a**

Multi-Season Occupancy

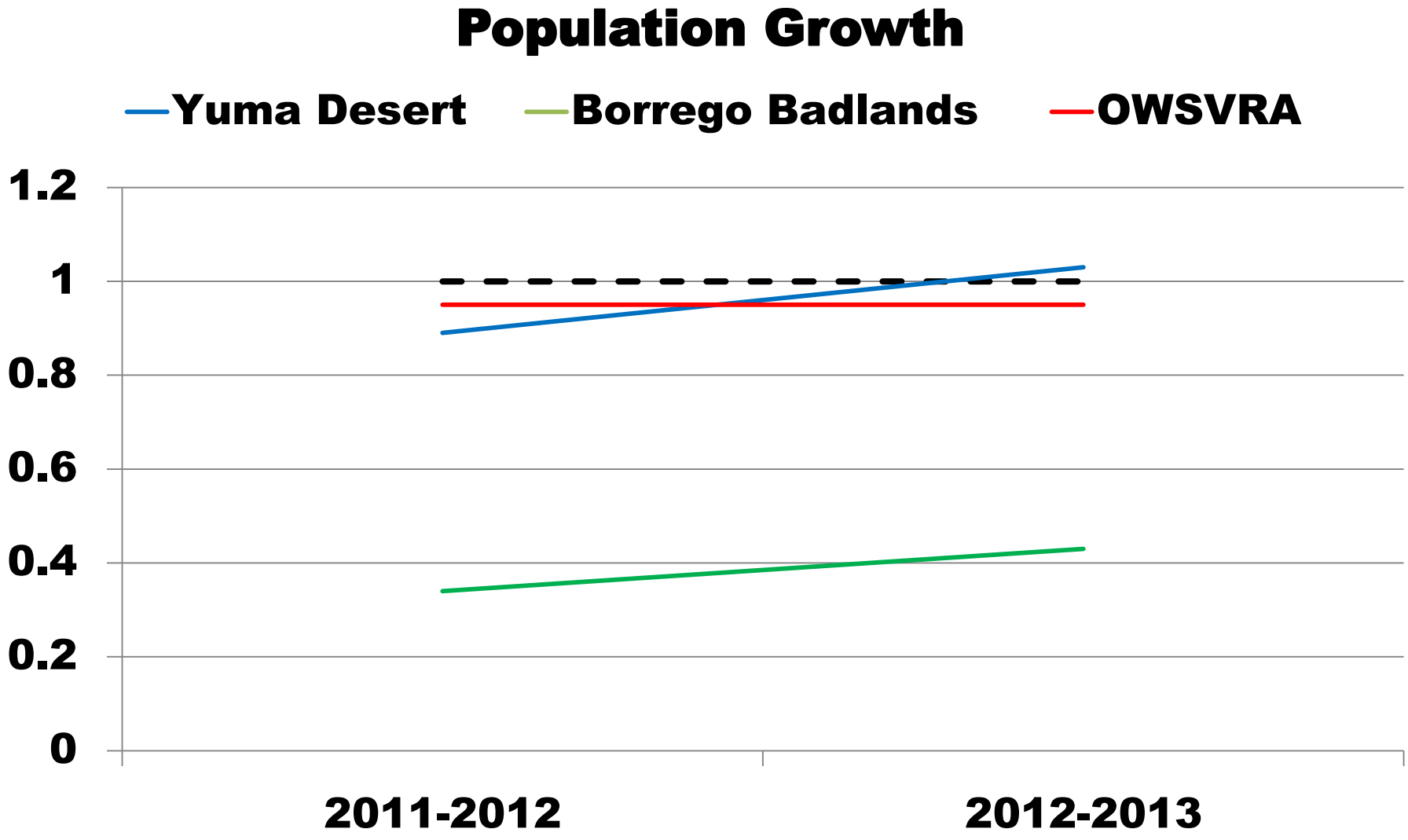
- **Modeled in program PRESENCE**
  - **Evaluated time, seasonal, and rainfall effects**

MA	Model	ΔAIC	AIC wt.	Model Likelihood	# Parameters
Yuma Desert	Ψ(yr), γ(.), ε(.), p (pass* wrain)	0.00	0.81	1.00	11
Borrego Badlands	Ψ(yr), γ(.), ε(.), p (prain)	0.00	0.20	1.00	4
OWSVRA	Ψ(yr), γ(.), ε(.), p (wrain)	0.00	0.46	1.00	4

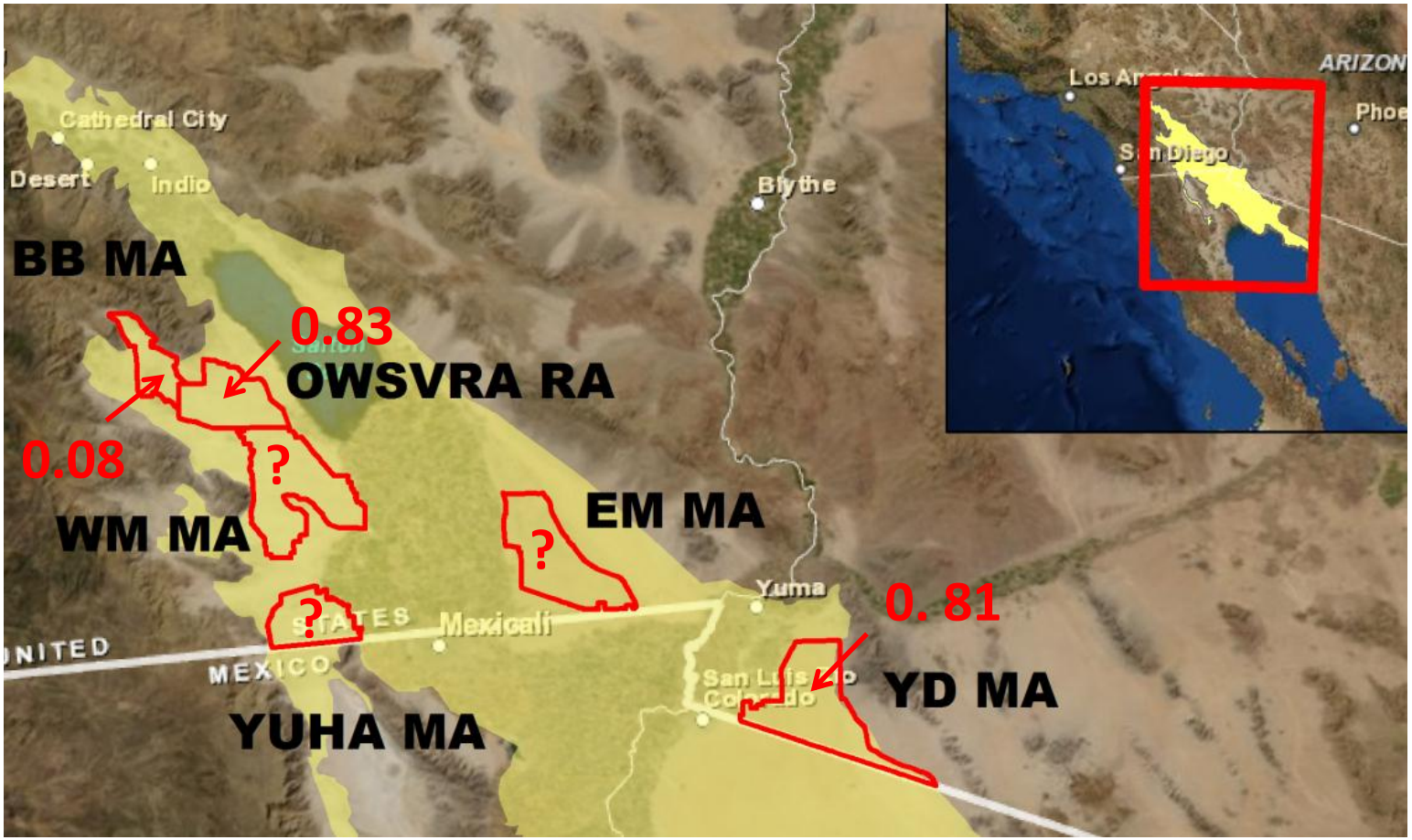
Multi-Season Occupancy



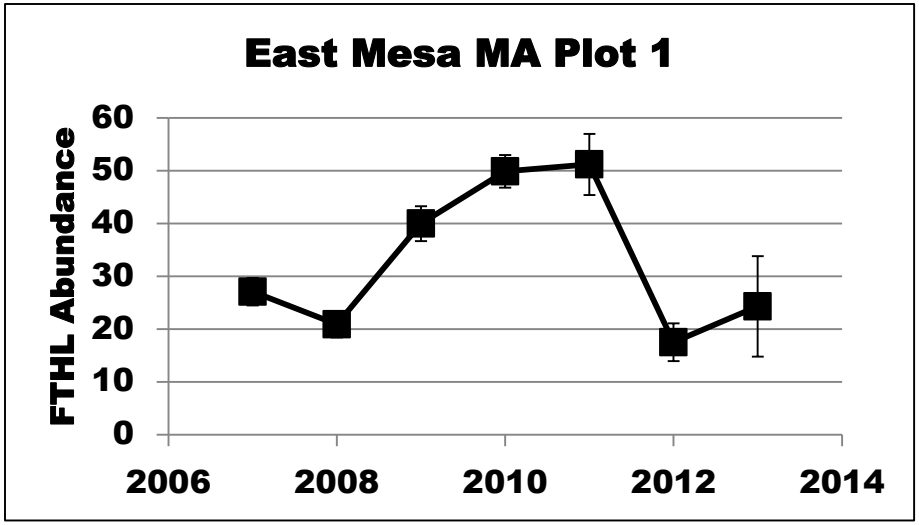
Multi-Season Occupancy

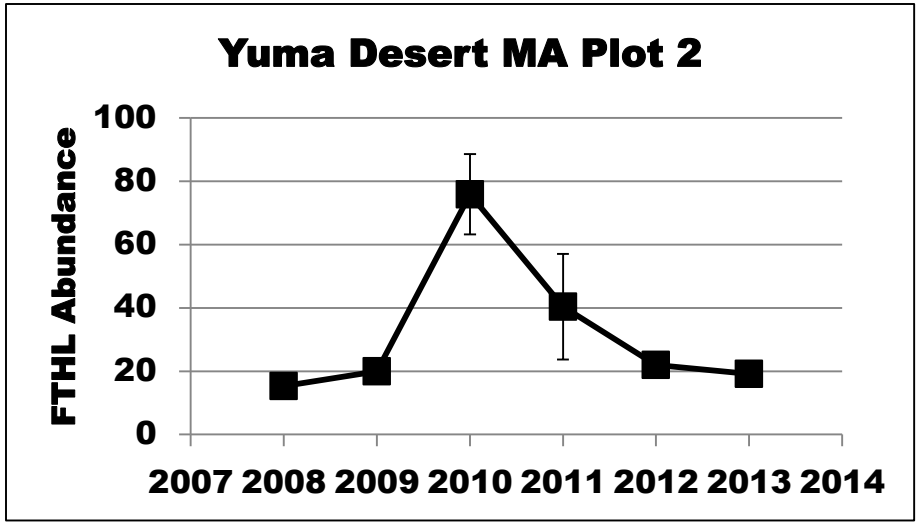


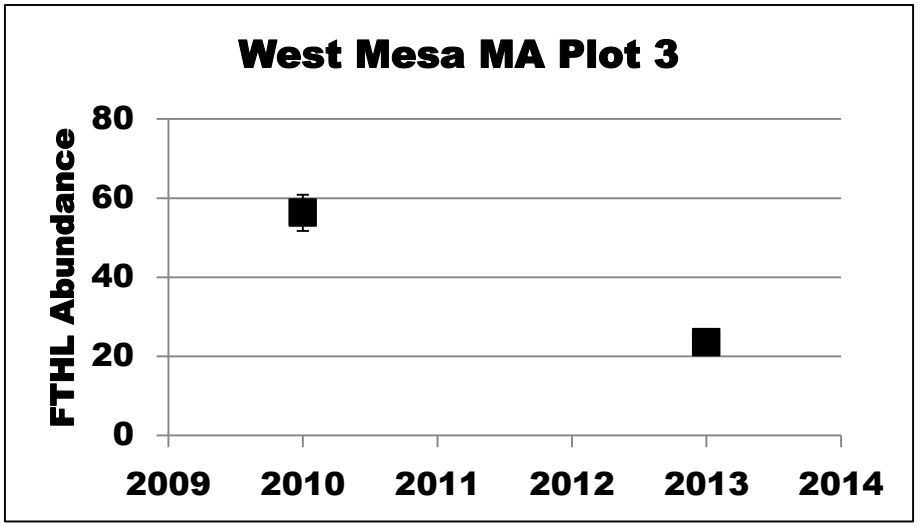
Multi-Season Occupancy



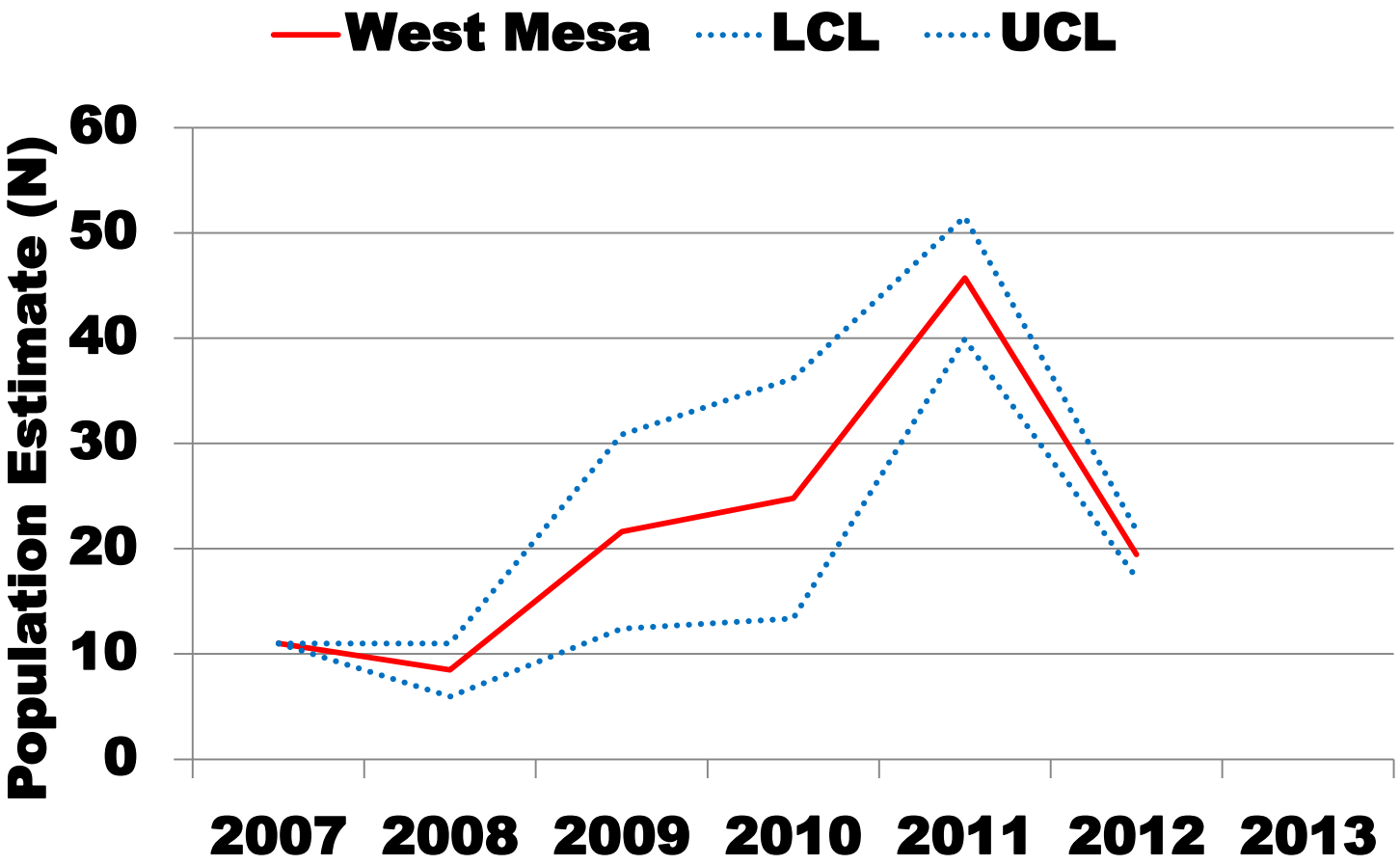
Huggins Closed Capture Abundances







Robust Pradel Models



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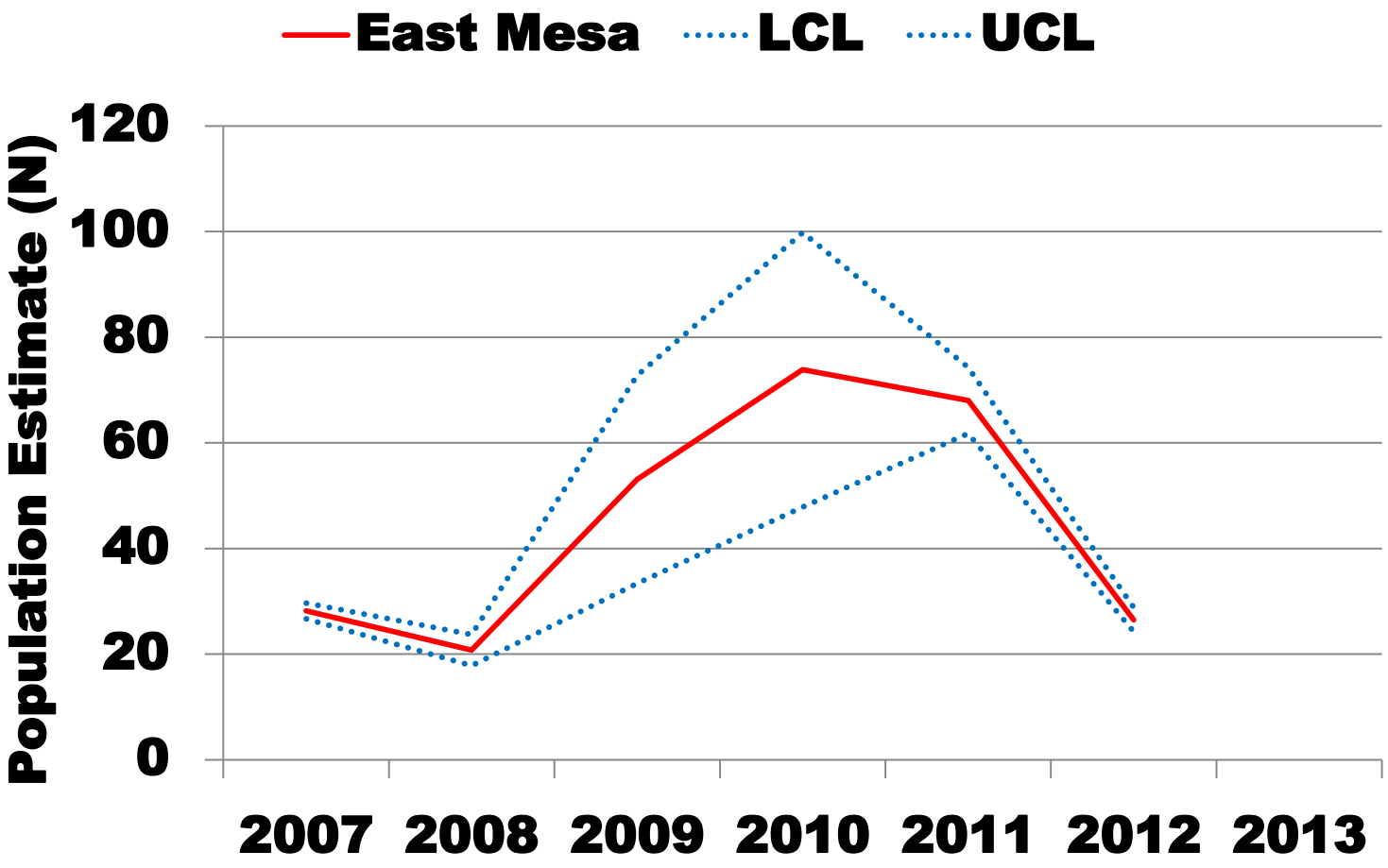

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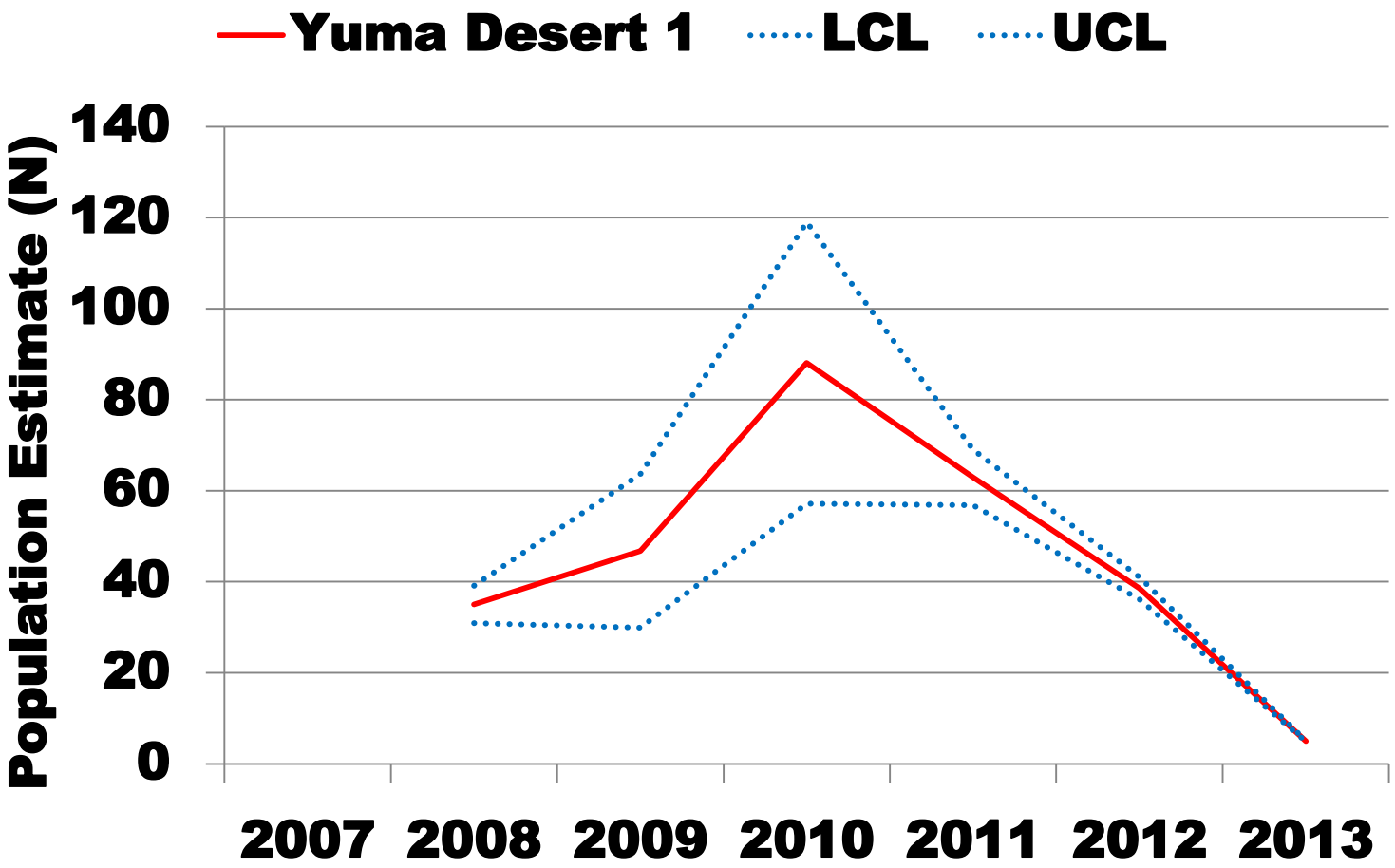

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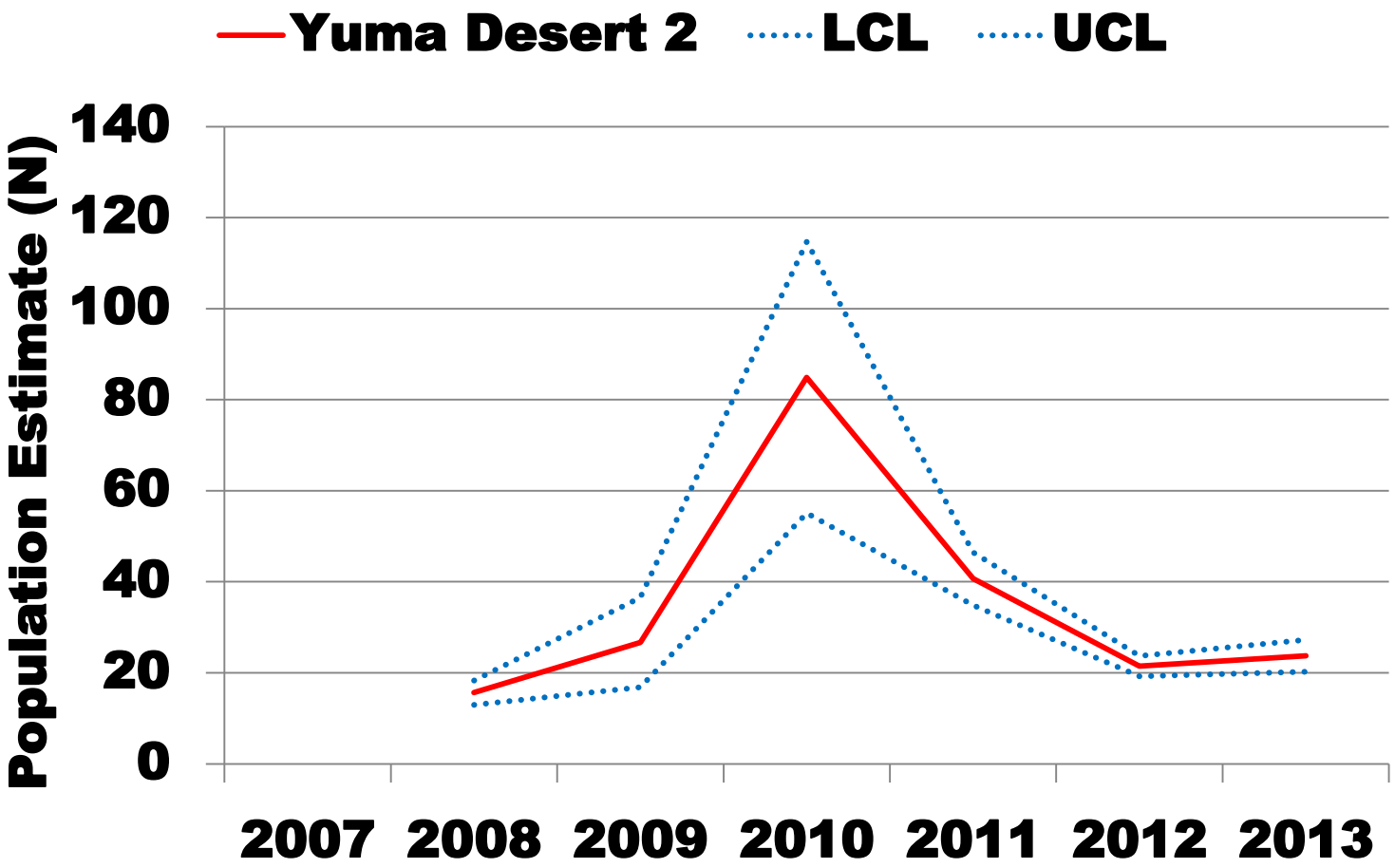
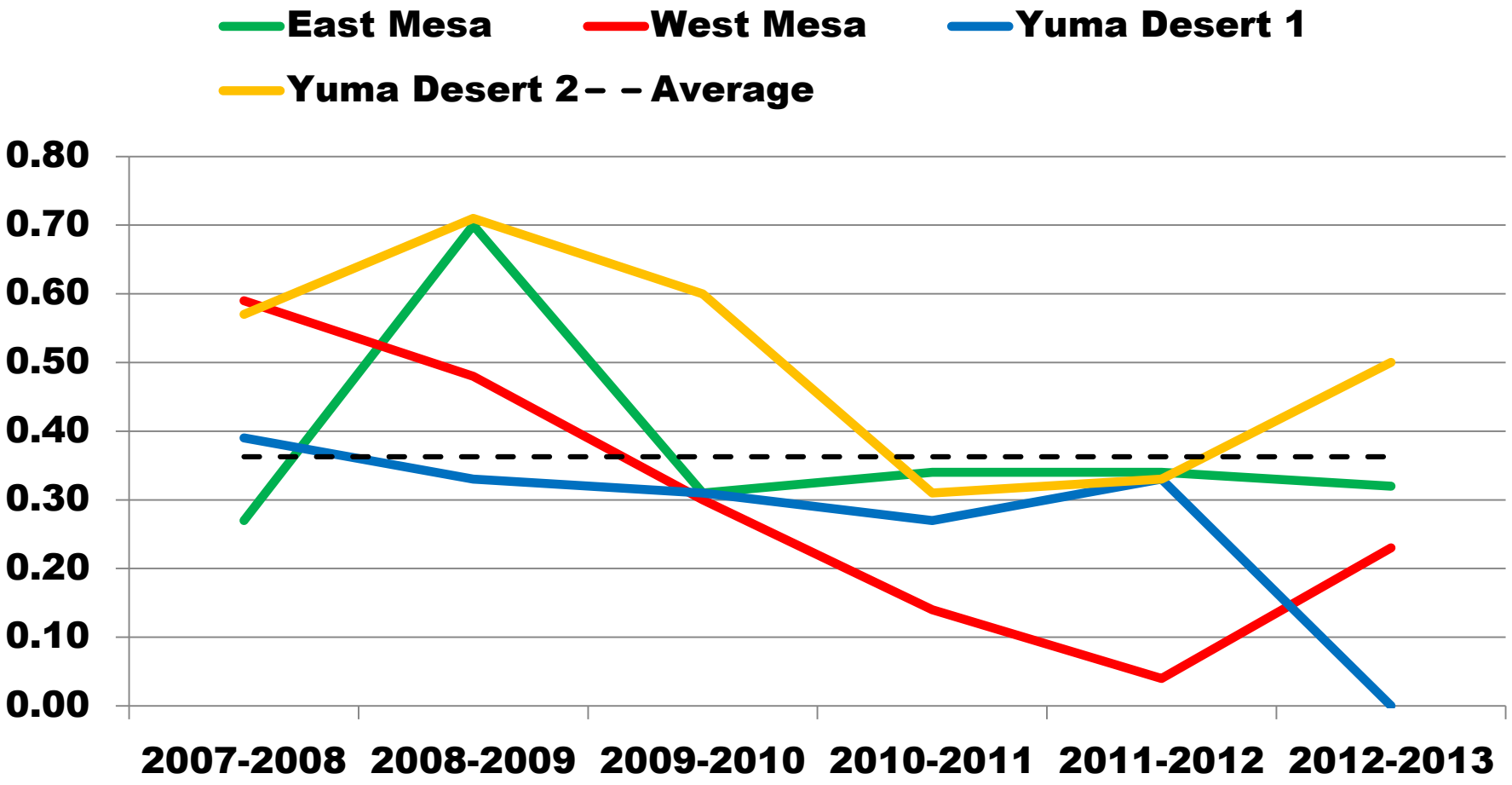
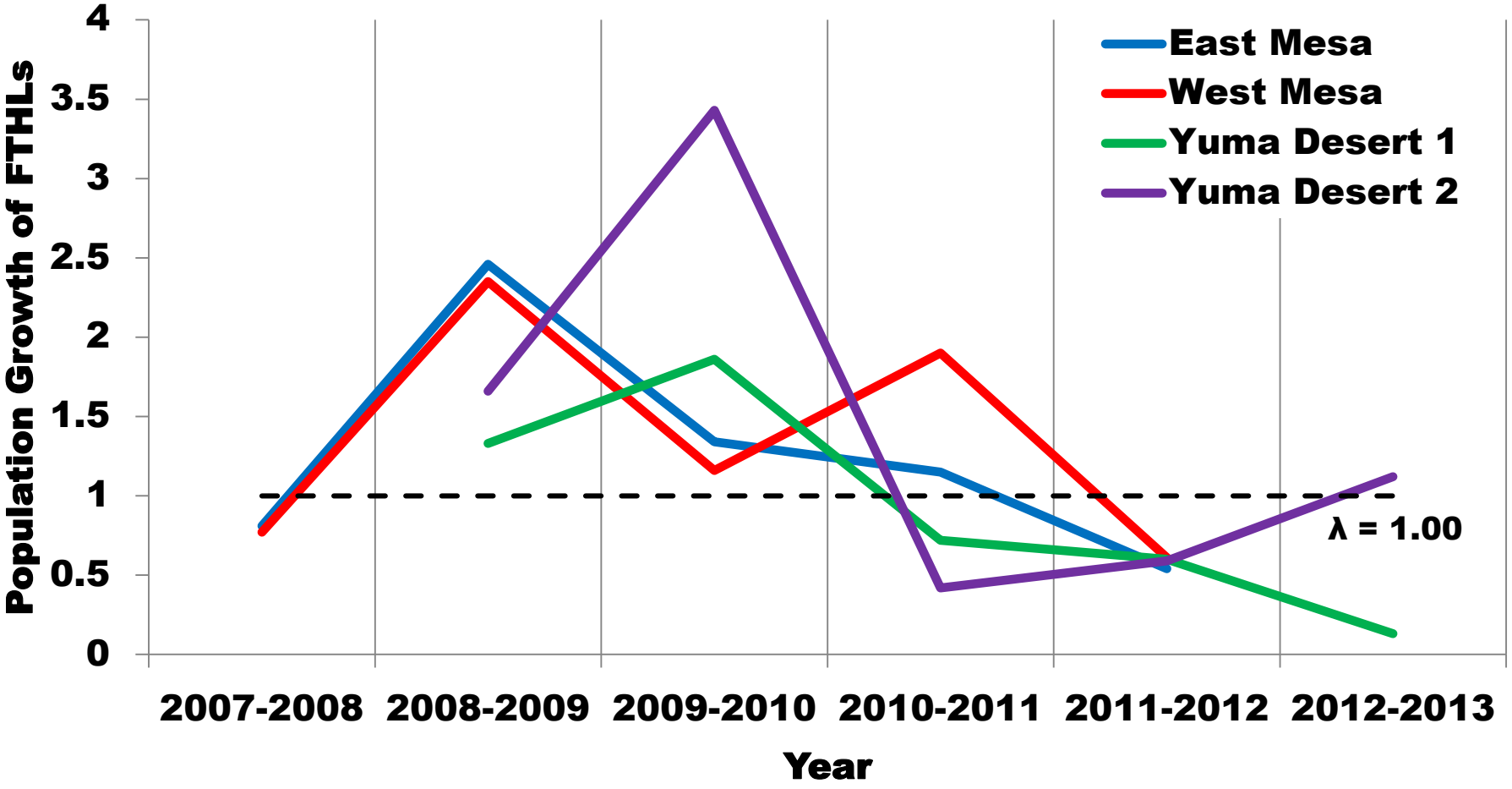


Robust Pradel Survivorship

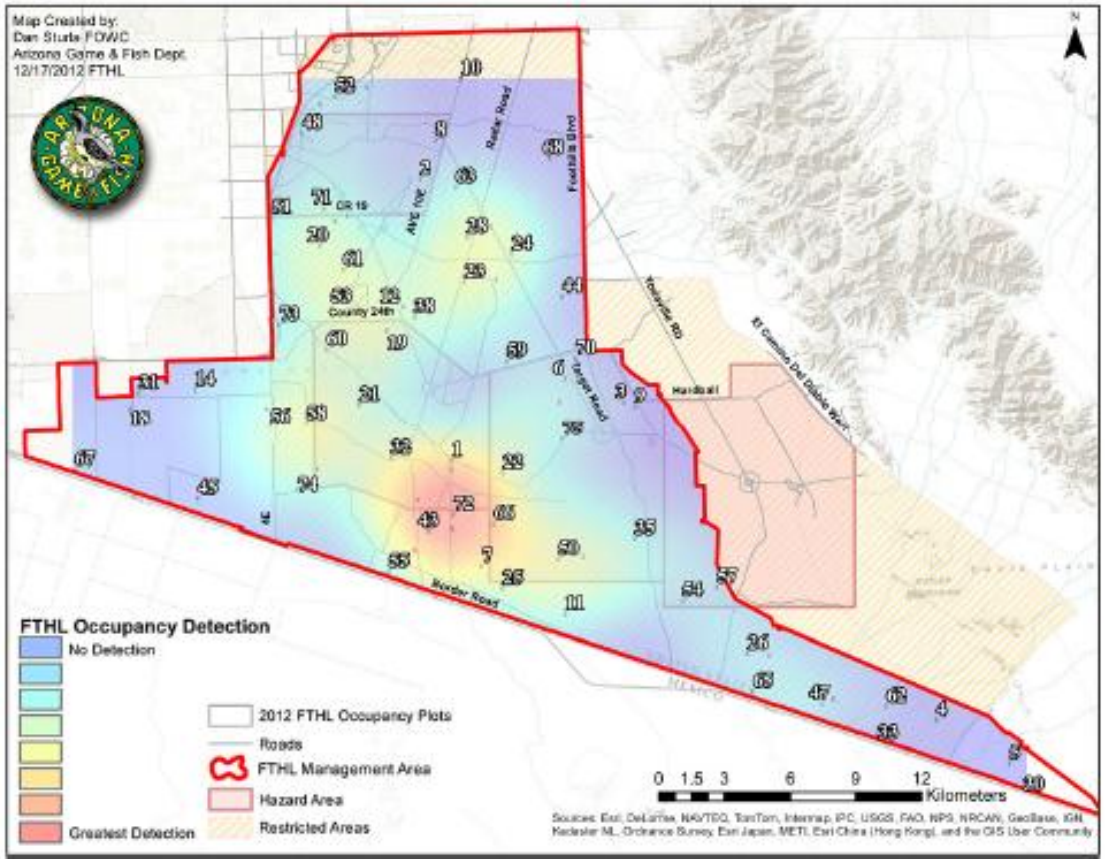


Robust Pradel Population Growth



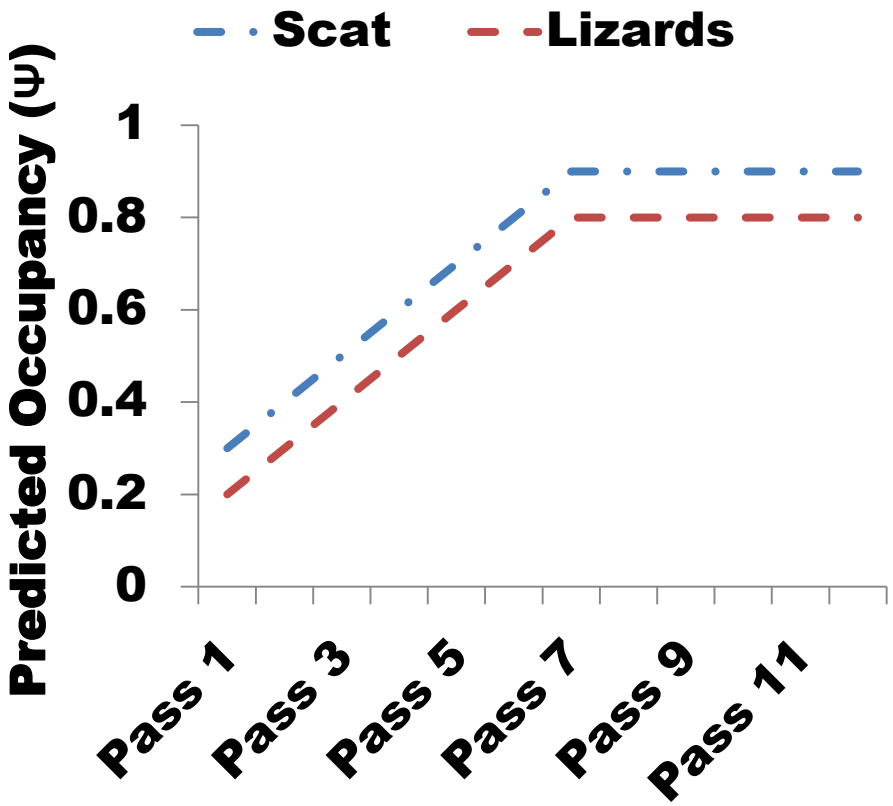
Issues

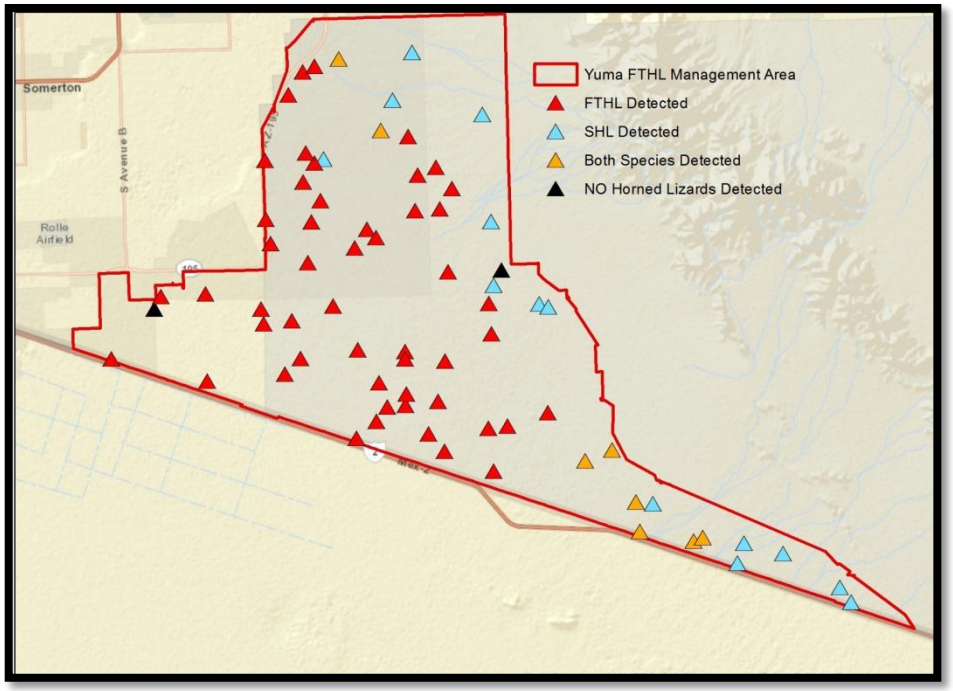
- **MA-wide estimates of abundance**

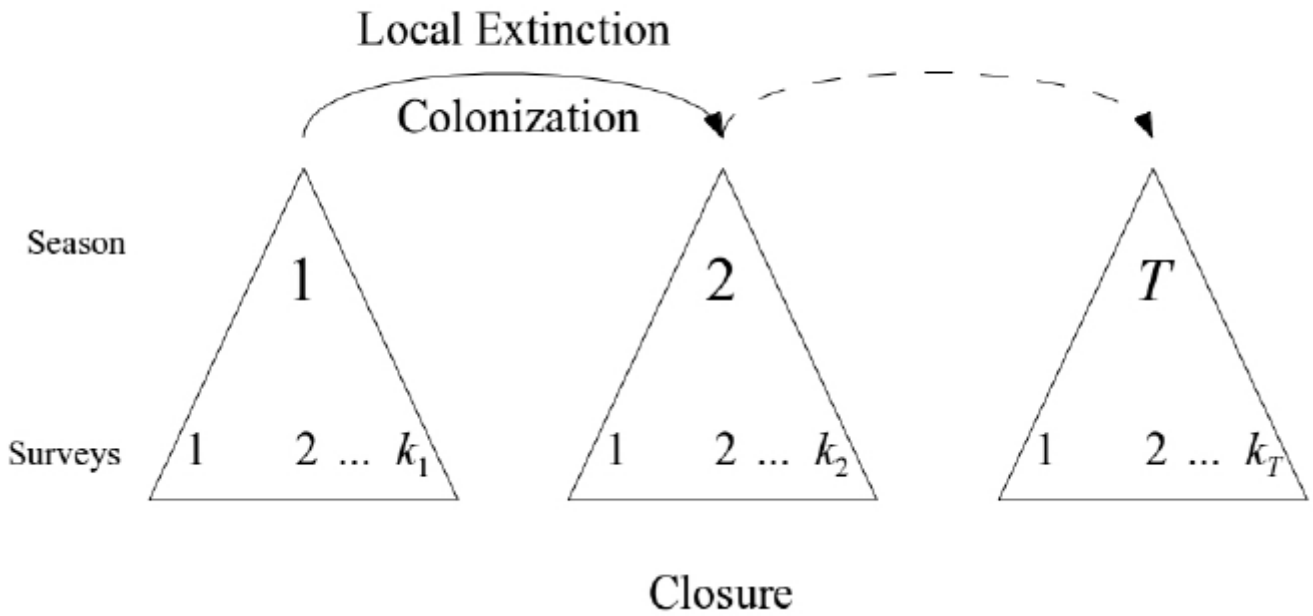


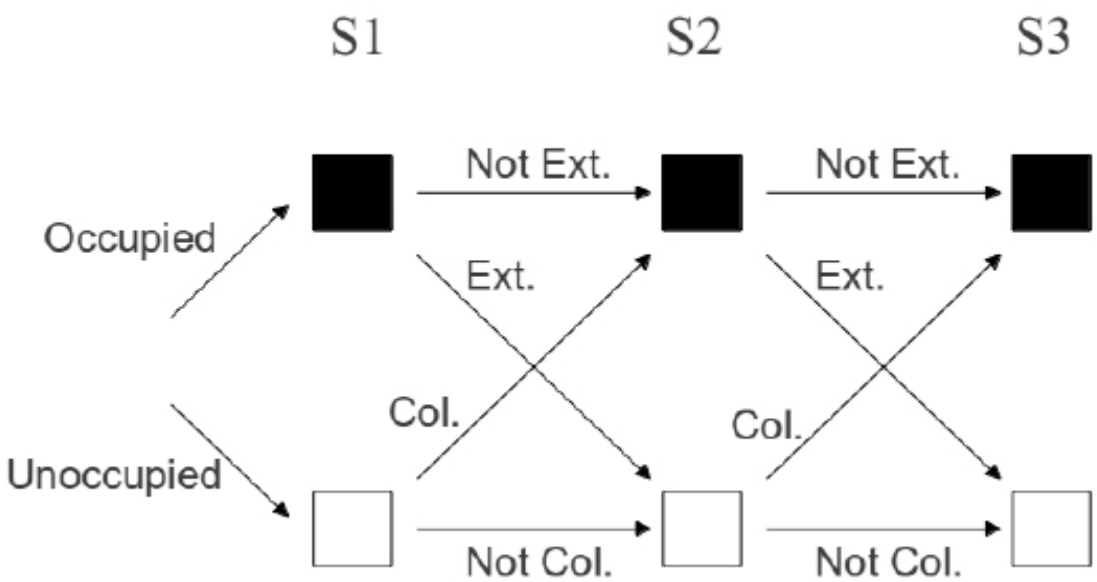
Issues continued

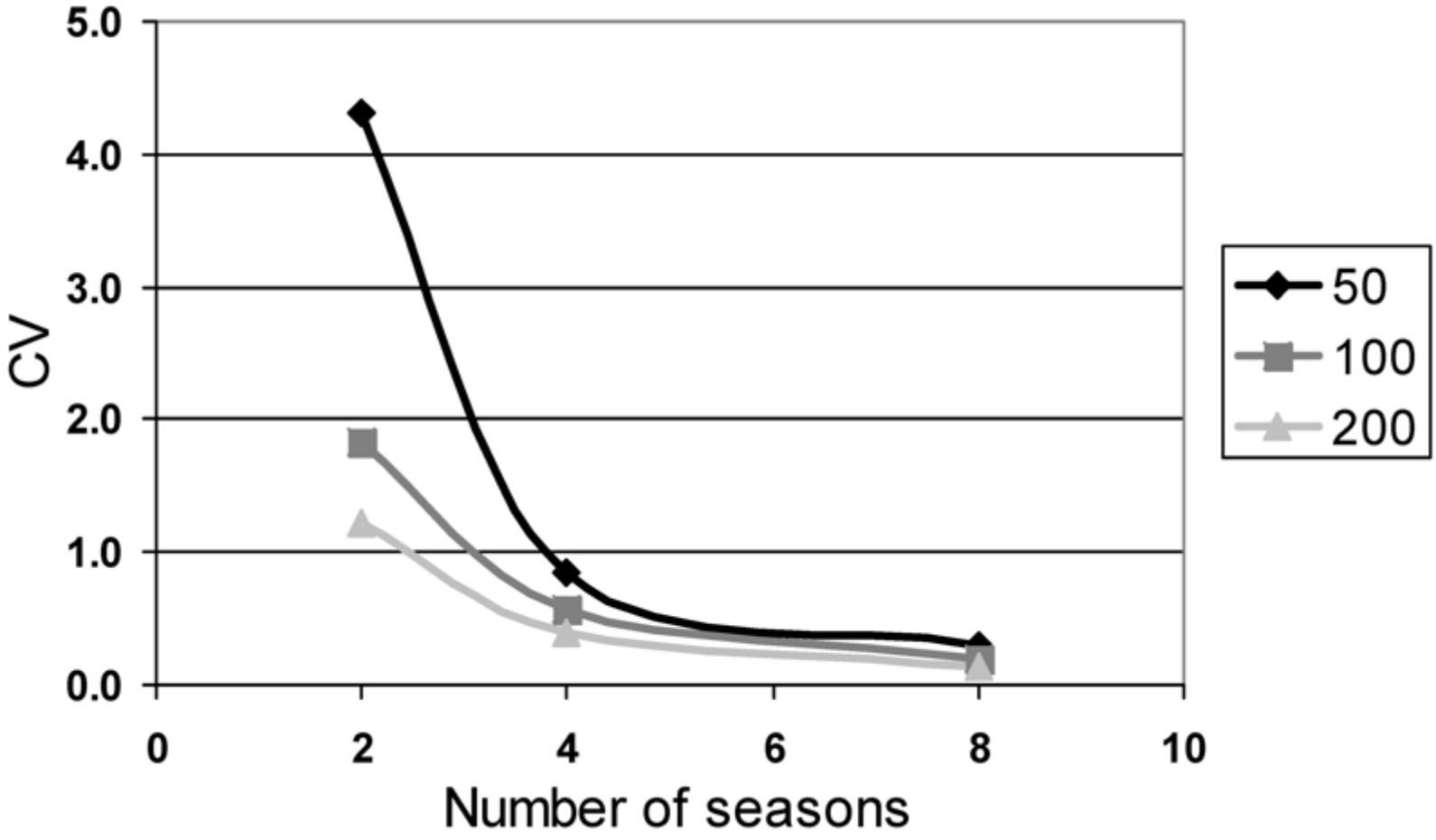
- **Use of scat in occupancy estimates**






Local Extinction
Colonization
Season
1
2
T
Surveys
1 2 ... k_1
1 2 ... k_2
1 2 ... k_T
Closure


S1
S2
S3
Occupied
Unoccupied
Not Ext.
Not Ext.
Ext.
Ext.
Col.
Col.
Not Col.
Not Col.


5.0
4.0
3.0
2.0
1.0
0.0
CV
0
2
4
6
8
10
Number of seasons
50
100
200

Moving forward

- **Recommendations:**
  - **Occupancy surveys need to occur at same sites each year for same effort**
  - **Demographic monitoring needs to occur at same locations each year**

Moving forward

- **Borrego Badlands should consider conducting demographic monitoring due to low occupancy estimates**
- **OWSVRA RA could conduct demographic monitoring to gather more information regarding trends**
- **Yuha Basin MA was not monitored last year. At last visit demographic estimates were highly variable.**

Moving forward

- **East Mesa** plot 1 is our longest-lasting regularly monitored demographic plot. Continue.
- **West Mesa** 1,2,3 infrequent demographic visits need to become the exception not the norm.
- **Yuma Desert MA** occupancy and demography trends are beginning to tell the same story. Continue

Thank You