

Temporal occupancy of MSCP bat species along the LCR

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Project Objective

- Assess Seasonal and nightly bat activity patterns at non-restoration areas using four acoustic stations along the LCR.

MSCP bat species

- Western Red Bat (*Lasiurus blossevillii*)



- California Leaf-Nosed Bat (*Macrotus Californicus*)



- Western Yellow Bat (*Lasiurus xanthinus*)



- Townsend's Big-eared bat (*Corynorhinus townsendii*)



Study Area

• Four Permanent Stations

1. Bill Williams River National Wildlife Refuge (BWRNWR)
2. Cibola National Wildlife Refuge (CNWR)
3. Picacho State Recreation Area (PSRA)
4. Mittry Lake Wildlife Area (MLWA)

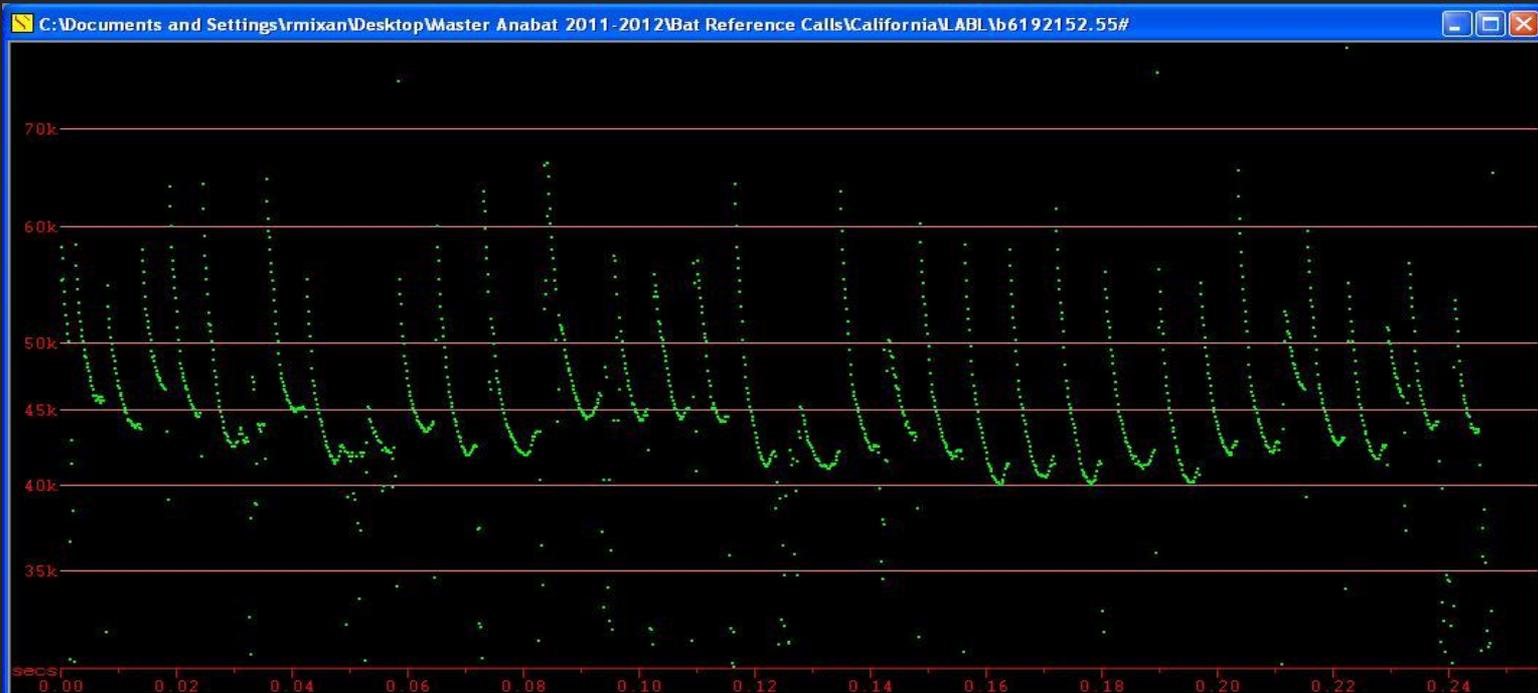


Methods

- Calls Recorded Nightly from Sunset to Sunrise
- Applied an all Bats Filter
- Species Specific Filters
- Manual Verification of Focal Species Calls (~80,000 Calls)
- Collected Weather Data (Temperature, Wind and Humidity)

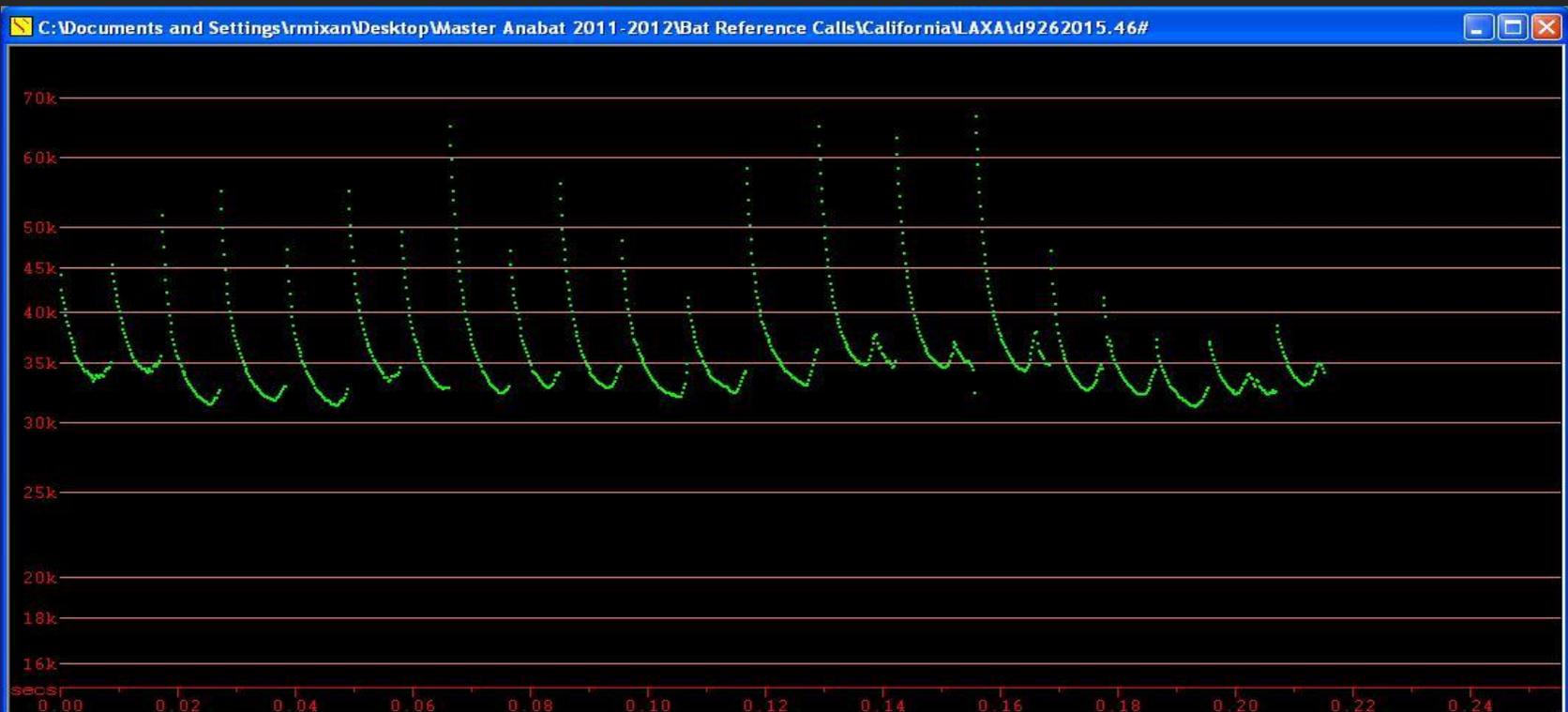
Acoustic Analysis

- Ran the Verified Calls Through a Call Minute Analysis
 - Measure of relative activity
 - Eliminates bias of over-estimating and under estimating abundance



Acoustic Analysis

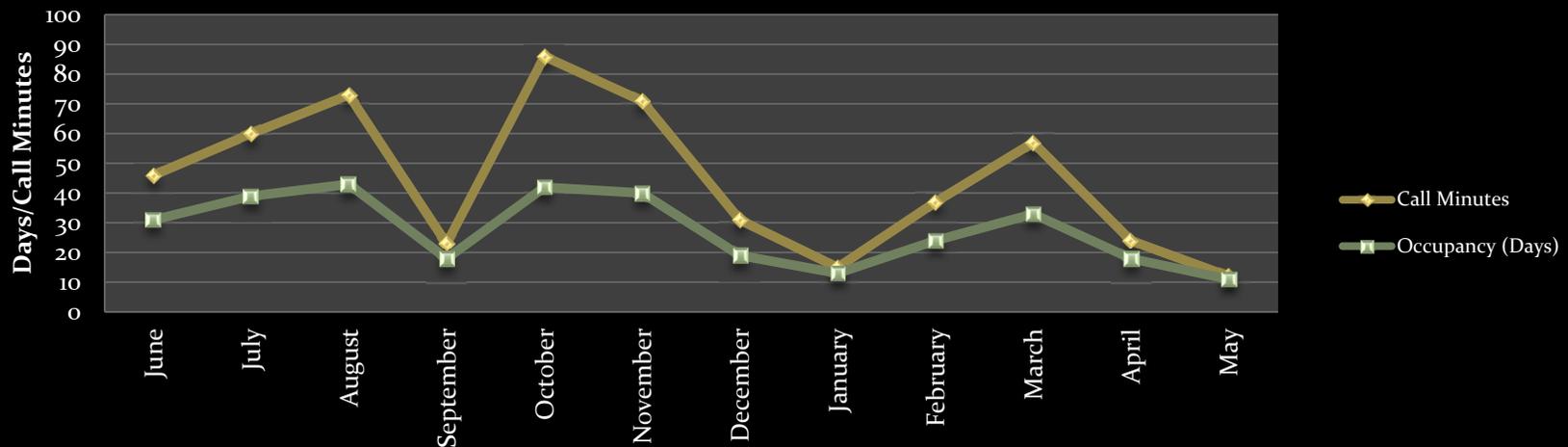
- Ran the Verified Calls Through an Occupancy Analysis
 - Presence/Absence Per Night
 - Determine Significant differences between stations and years



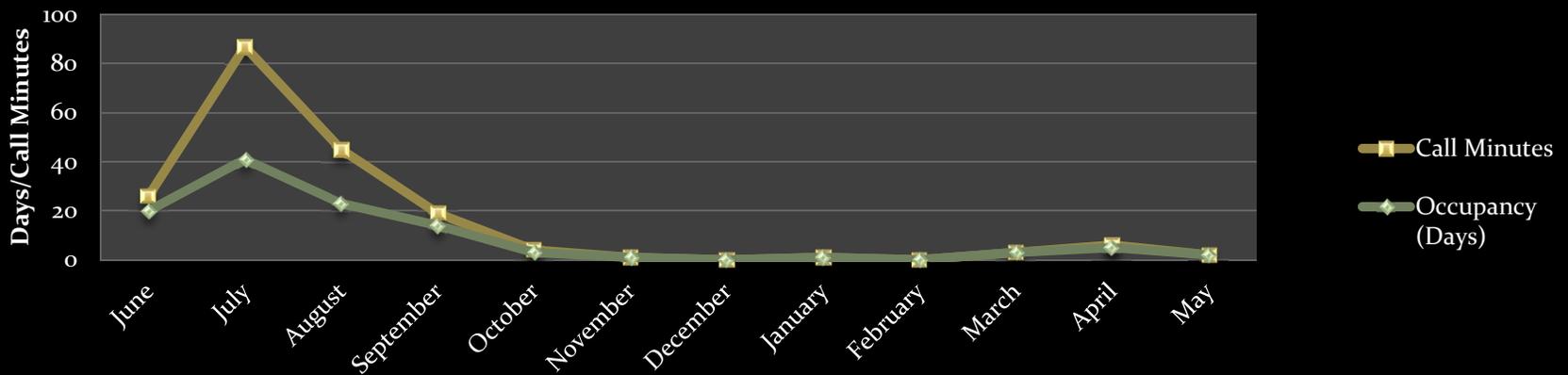
Results

- Western Red Bat Occupancy and Activity Magnitude

BWRNWR 2010-2013

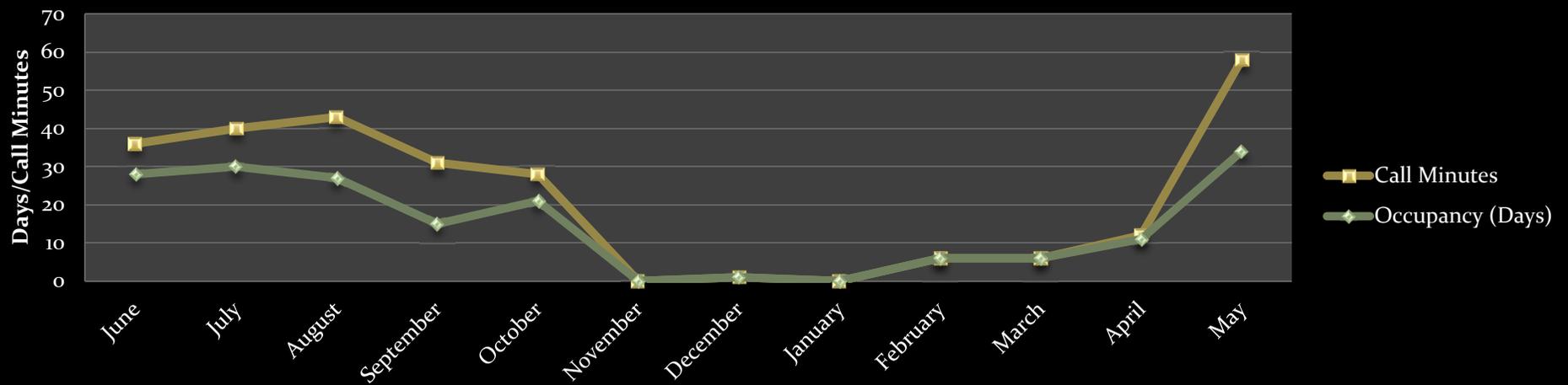


CNWR 2010-2013

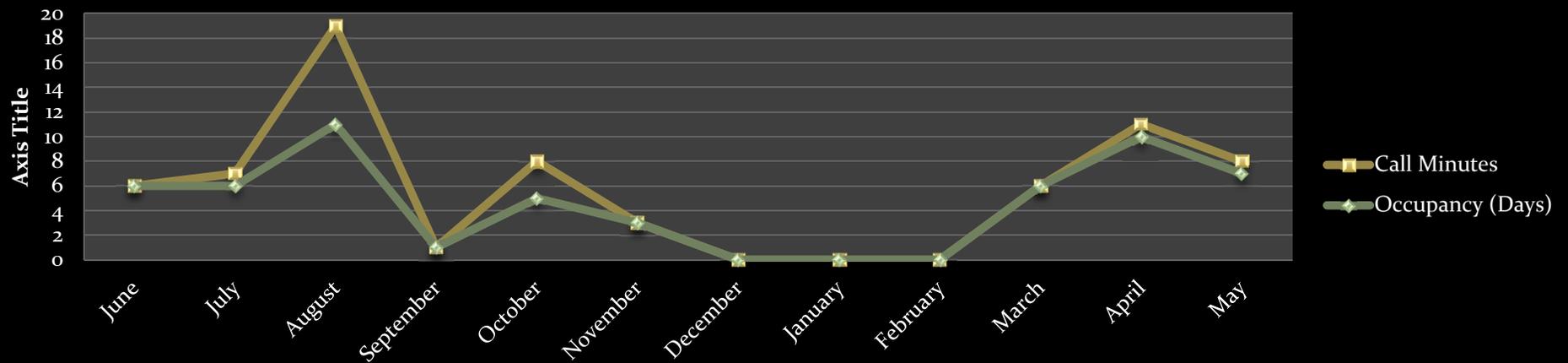


Western Red Bat Occupancy and Activity Magnitude

MLWA 2010-2013

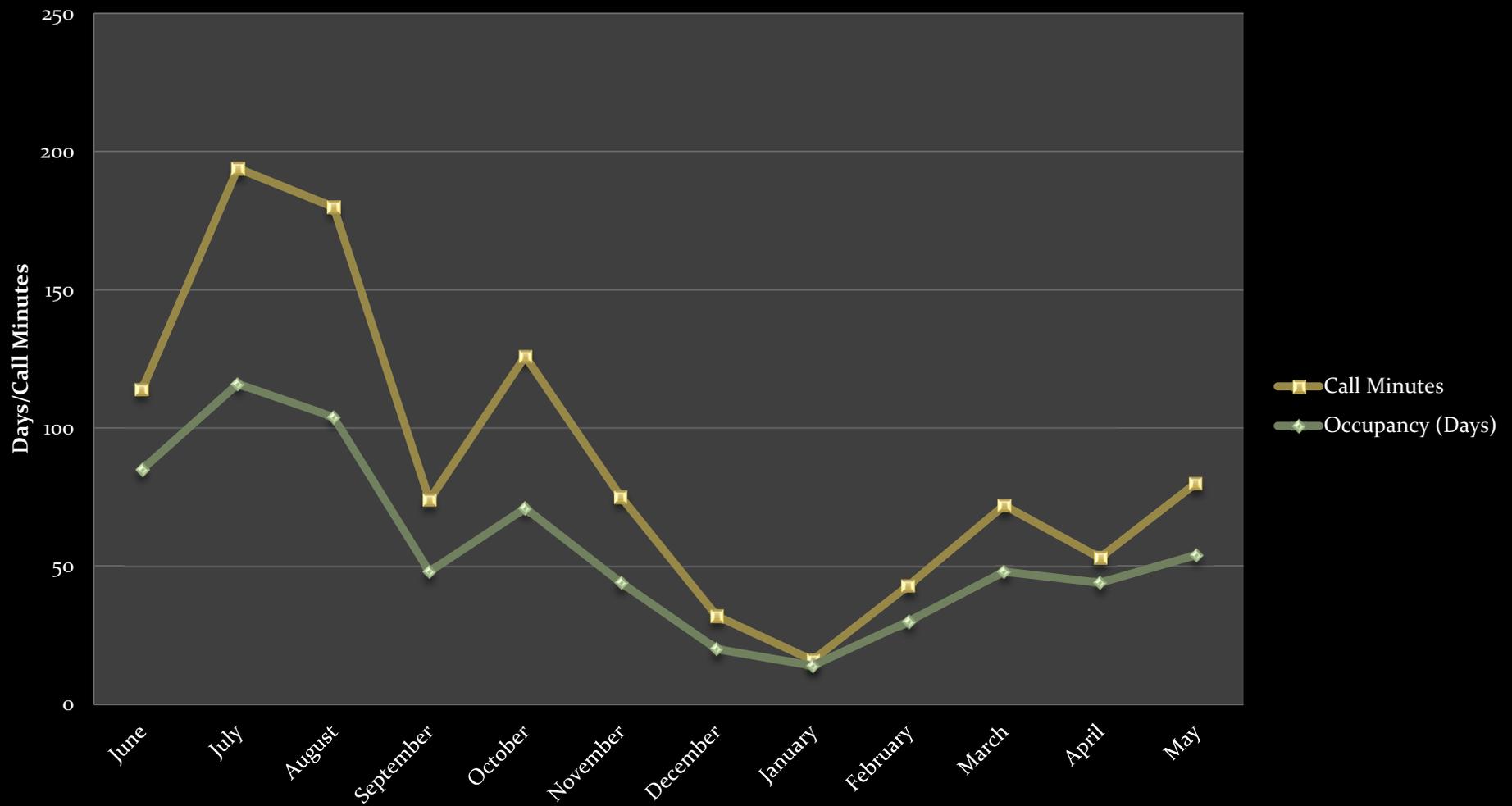


PSRA 2010-2013



Western Red Bat Occupancy and Activity Magnitude

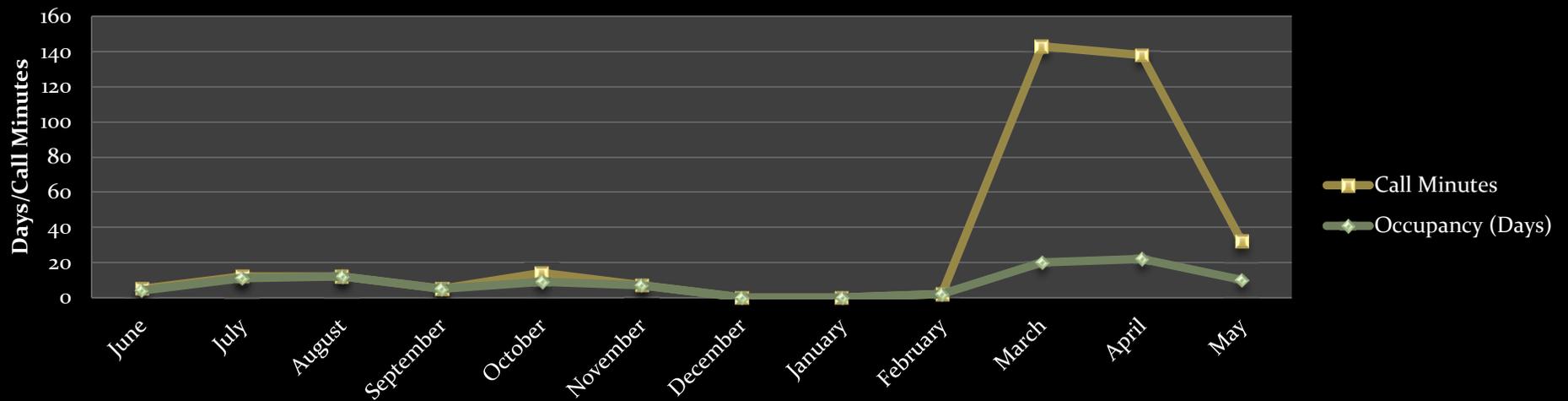
LABL All Stations 2010-2013



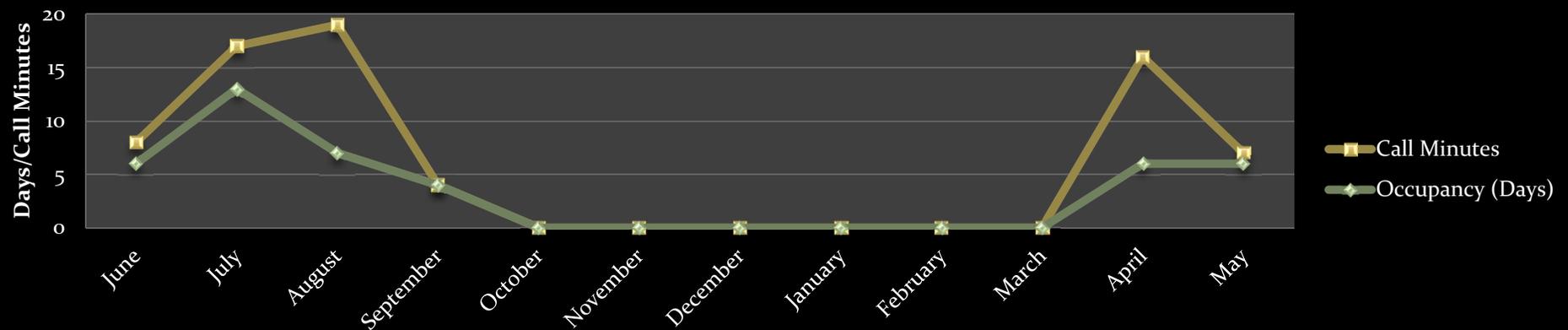
Results

- Western Yellow Bat Occupancy and Activity Magnitude

BWRNWR 2010-2013

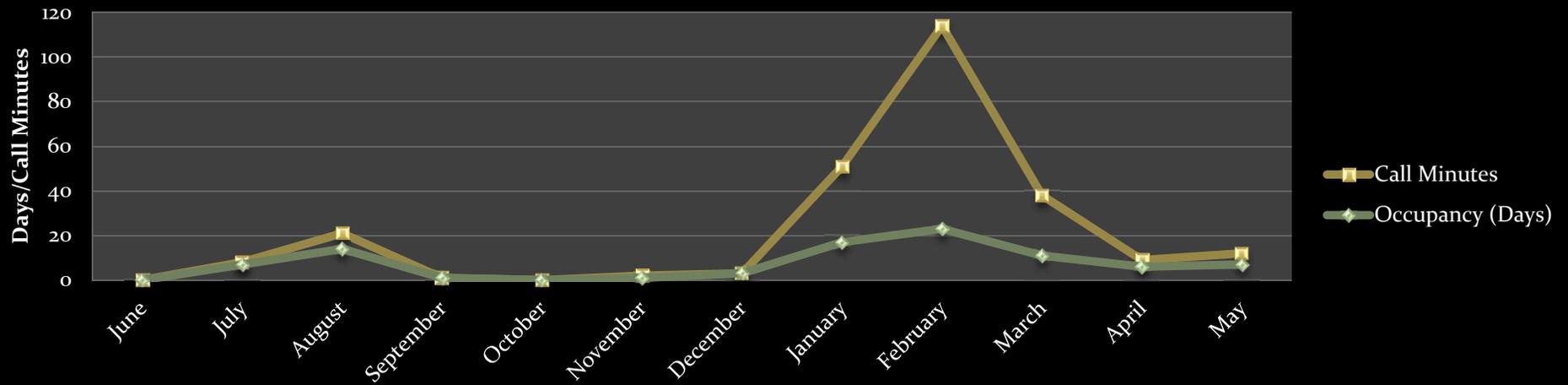


CNWR 2010-2013

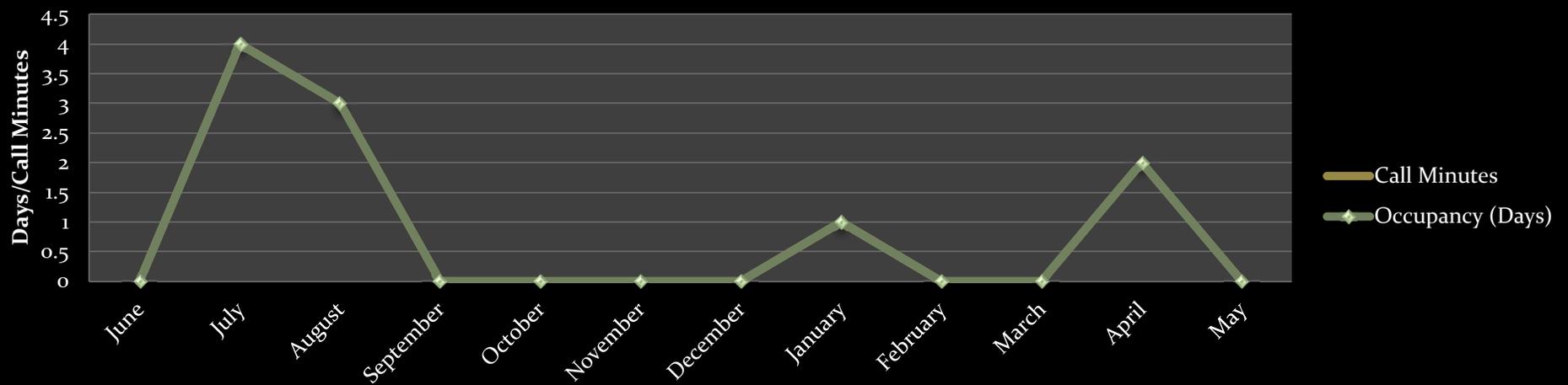


Western Yellow Bat Occupancy and Activity Magnitude

MLWA 2010-2013

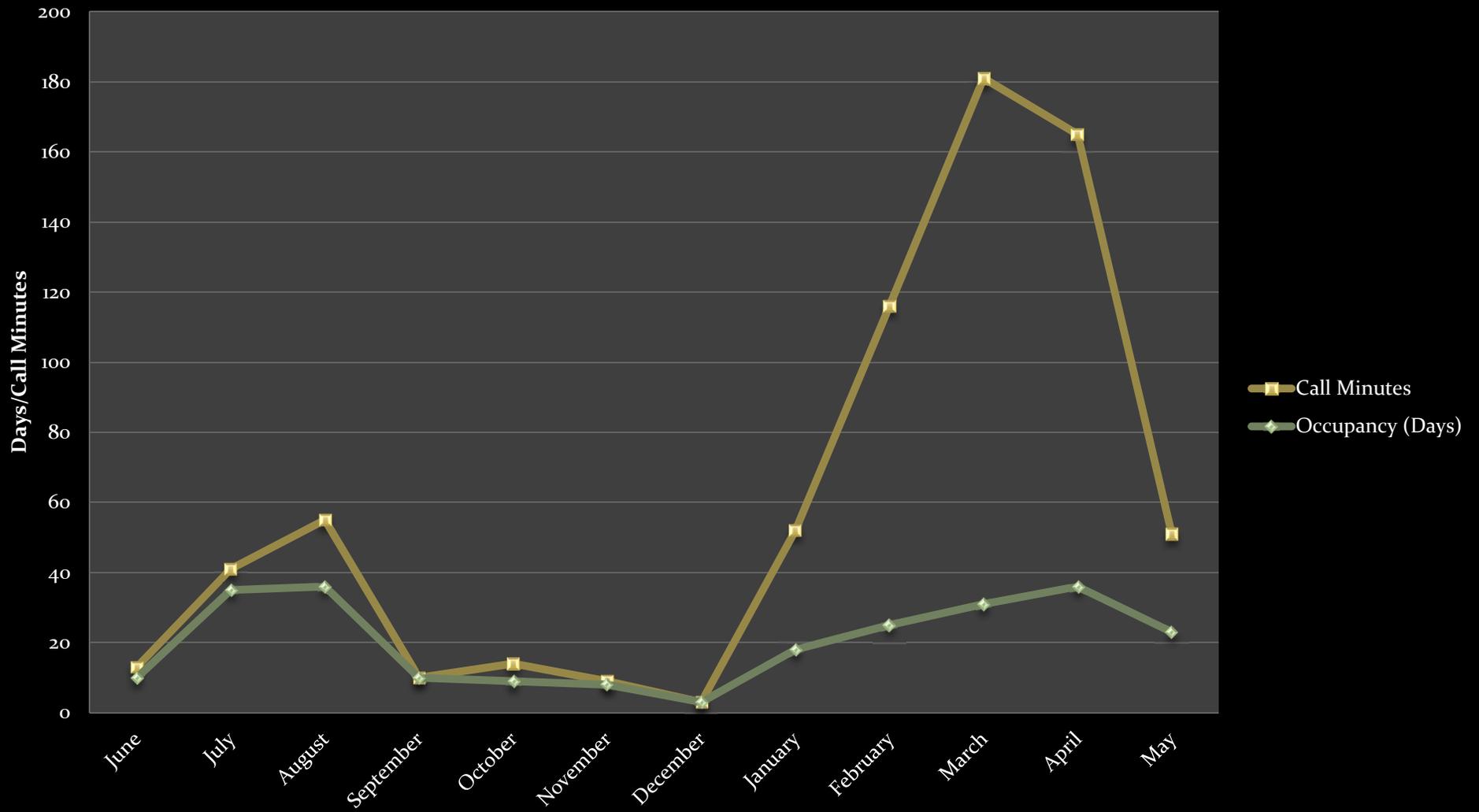


PSRA 2010-2013



Western Yellow Bat Occupancy and Activity Magnitude

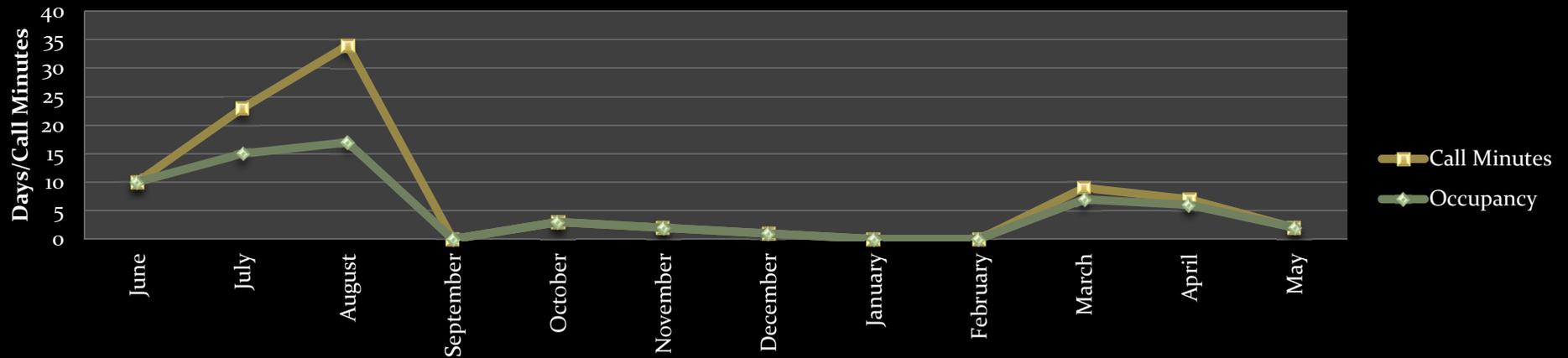
LAXA All Stations 2010-2013



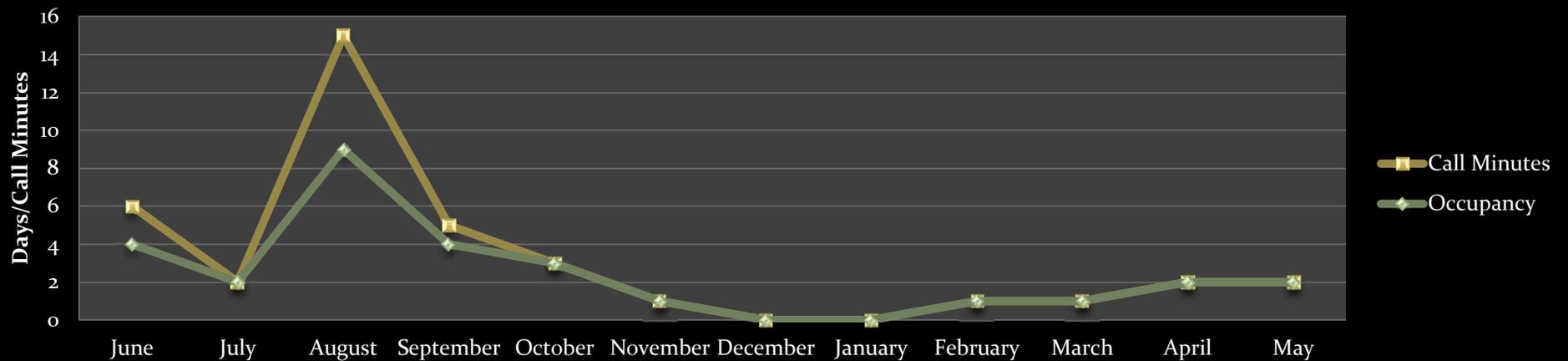
Results

- California Leaf-Nosed Occupancy and Activity Magnitude

BWRNWR 2010-2013

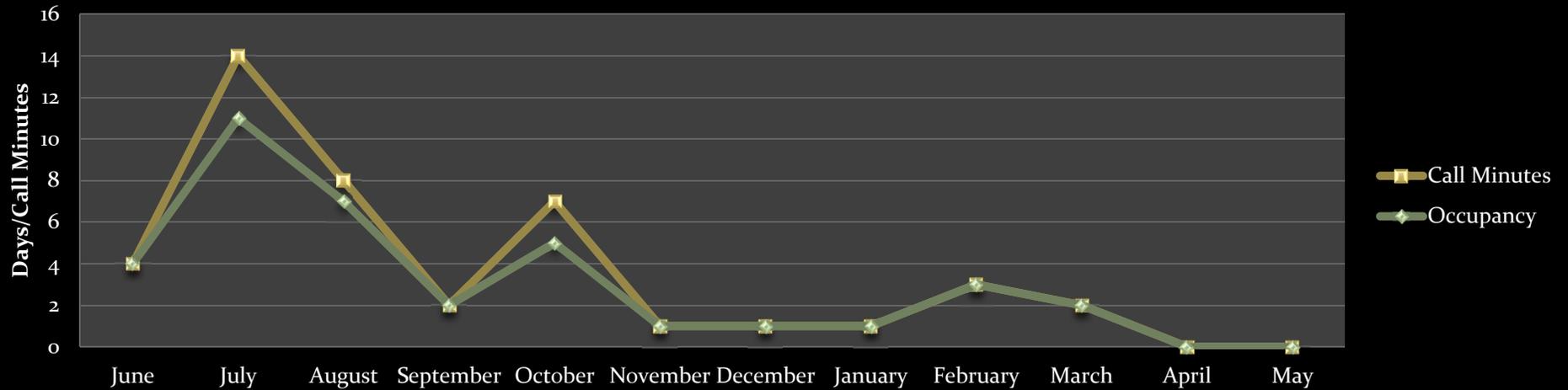


CNWR 2010-2013

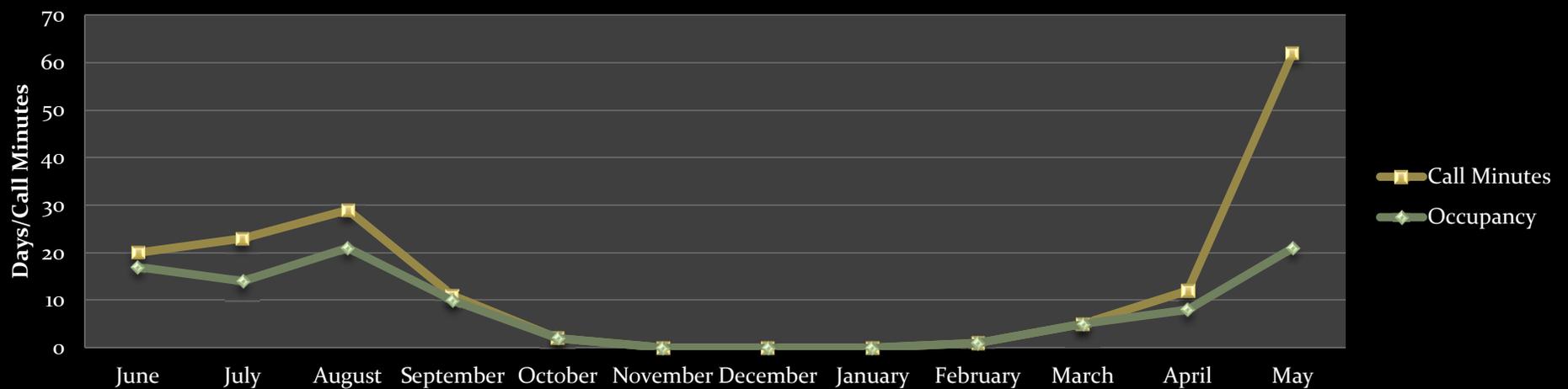


California Leaf-Nosed Occupancy and Activity Magnitude

MLWA 2010-2013

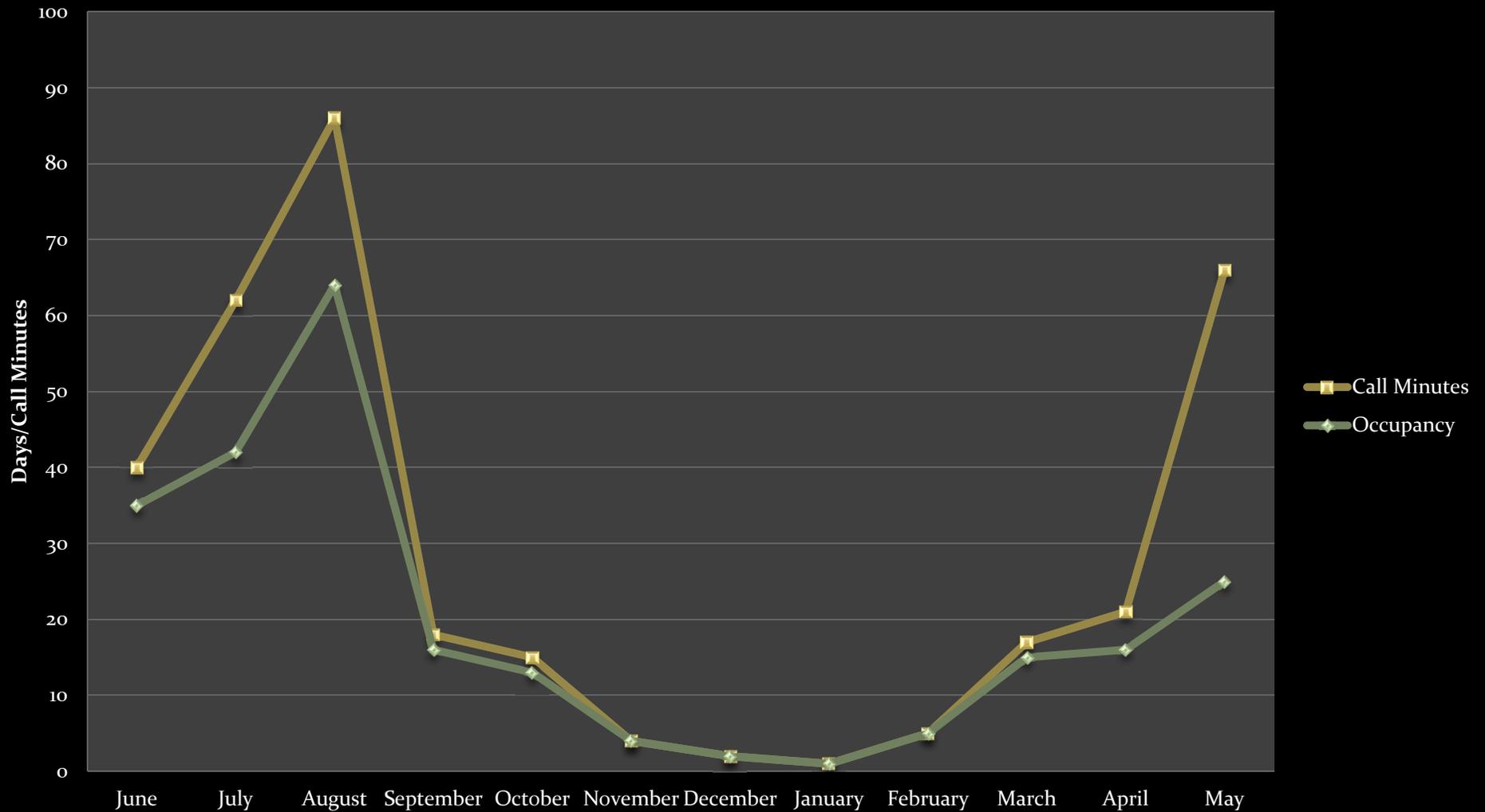


PSRA 2010-2013



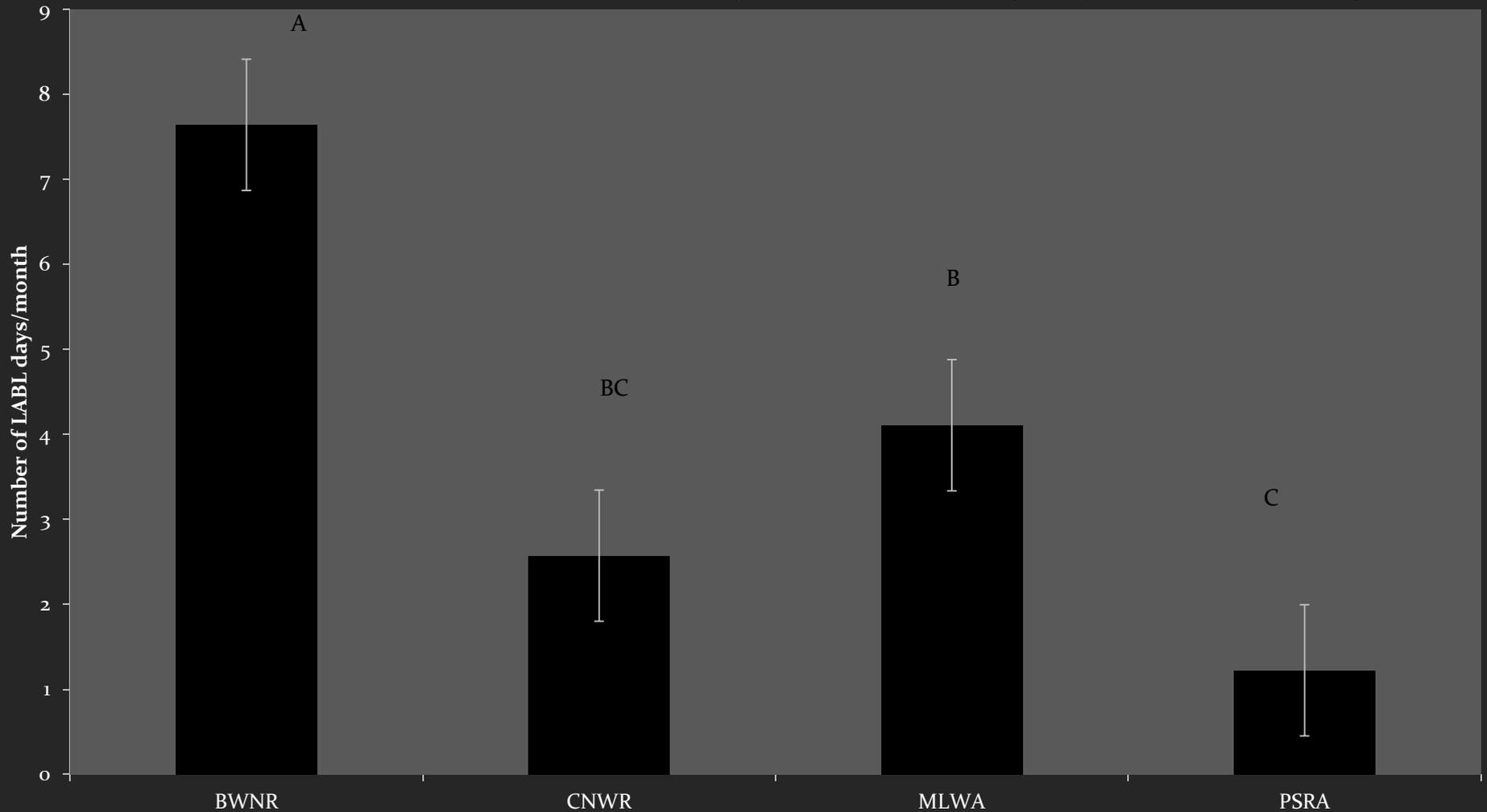
California Leaf-Nosed Occupancy and Activity Magnitude

MACA All Stations 2010-2013

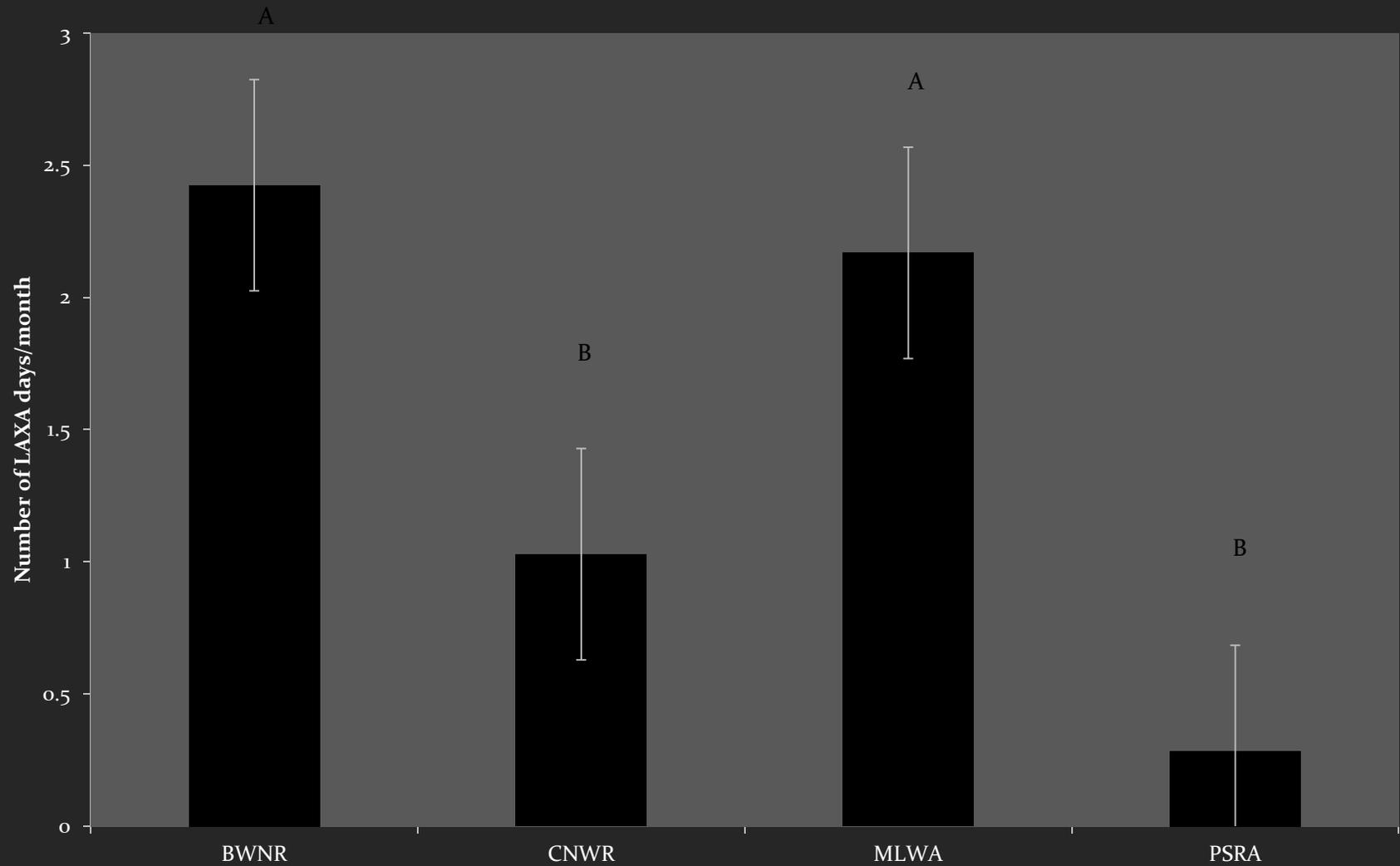


Occupancy Results

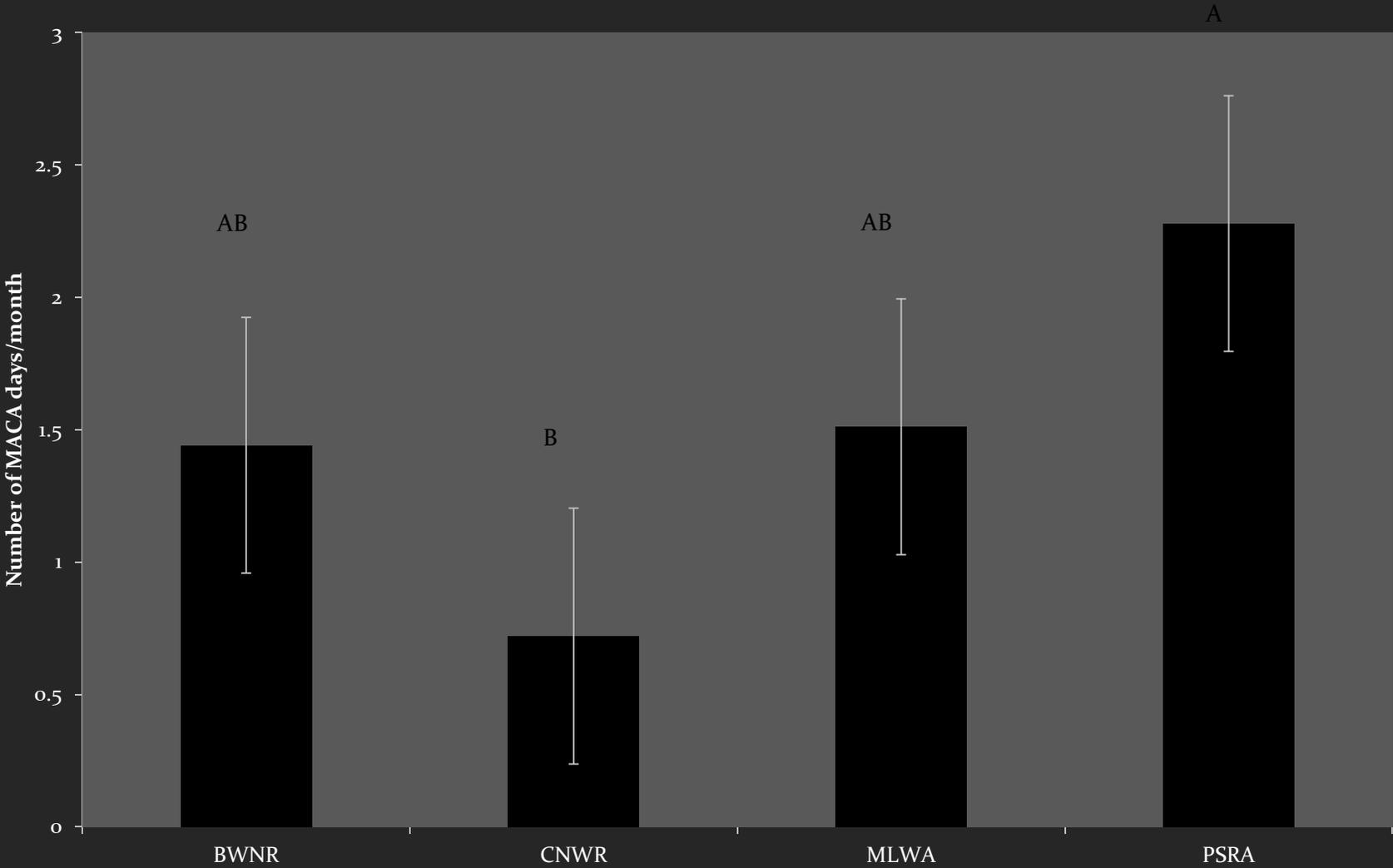
Western Red Bat Occupancy Per Station (Days per Month)



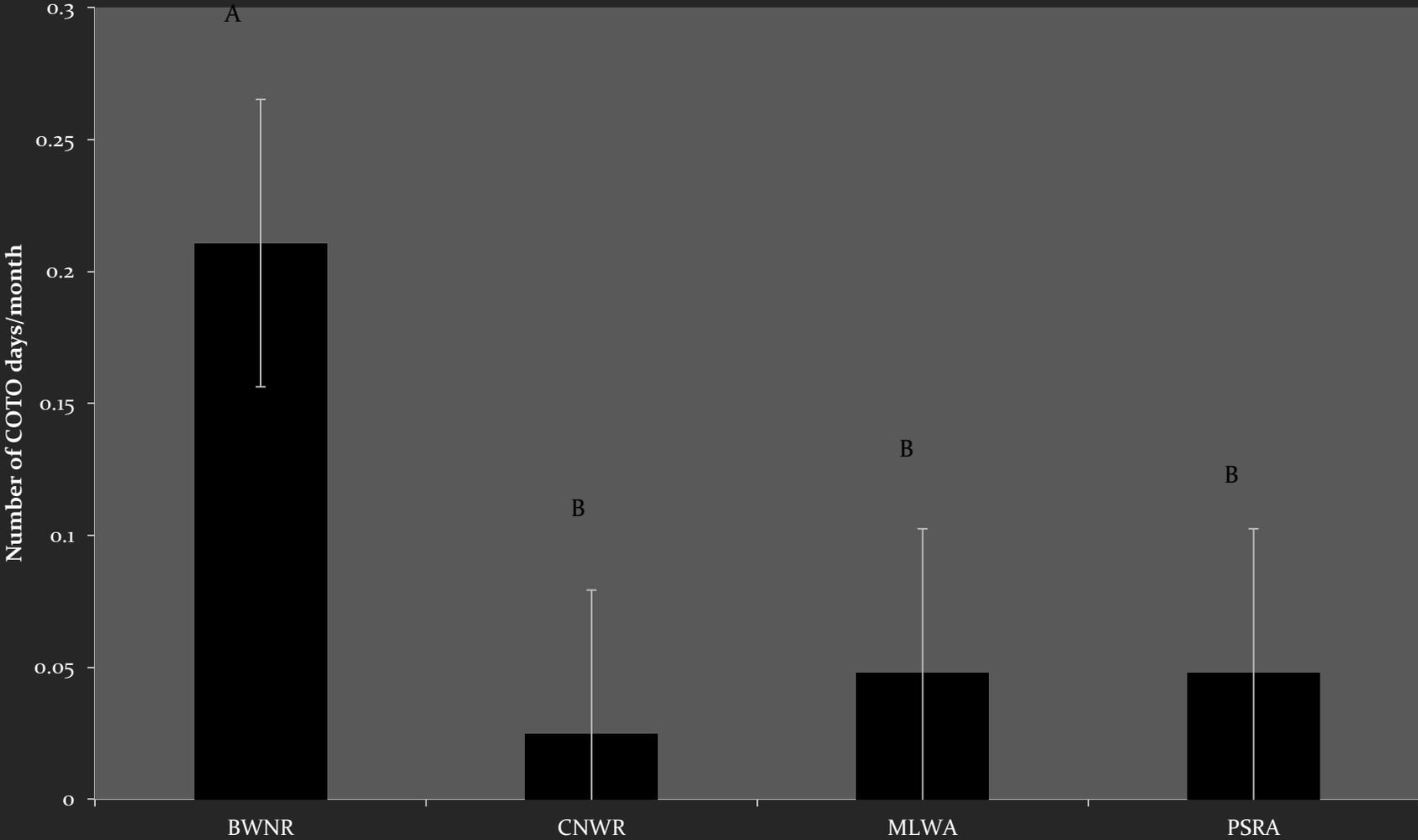
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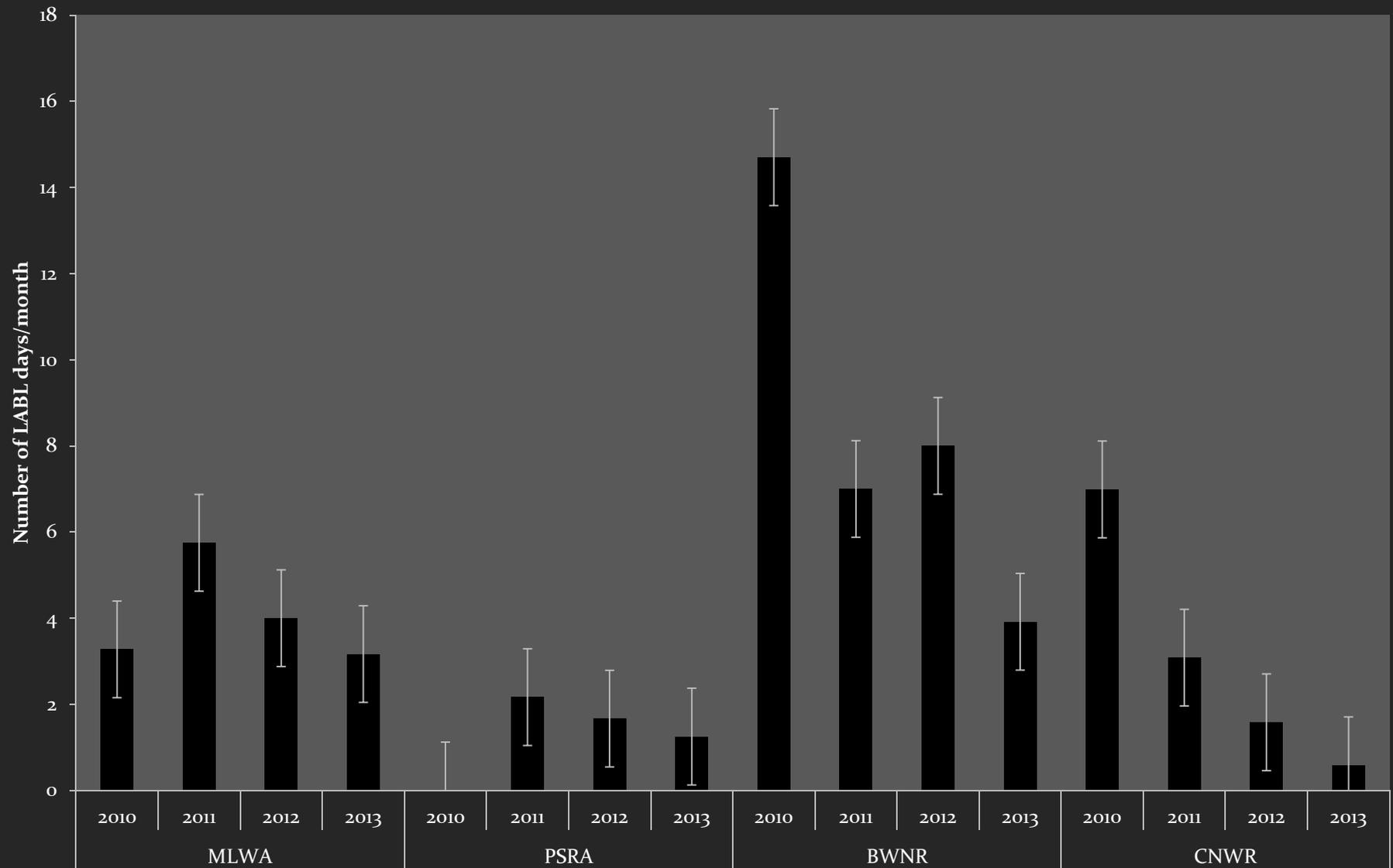
California Leaf-Nosed Occupancy Per Station (Days Per Month)



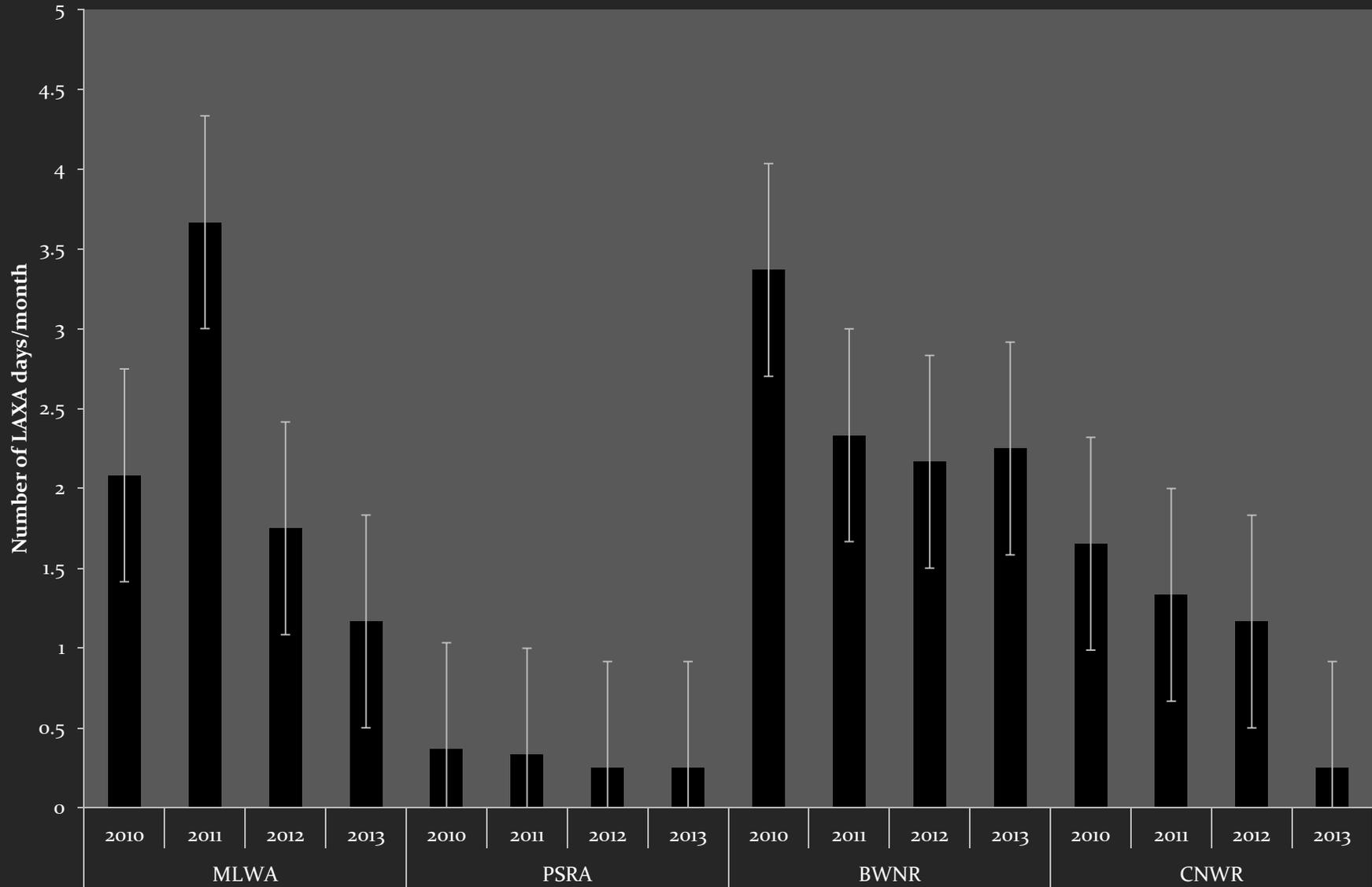
Townsend's Big-Eared Bat Occupancy Per Station (Days Per Month)



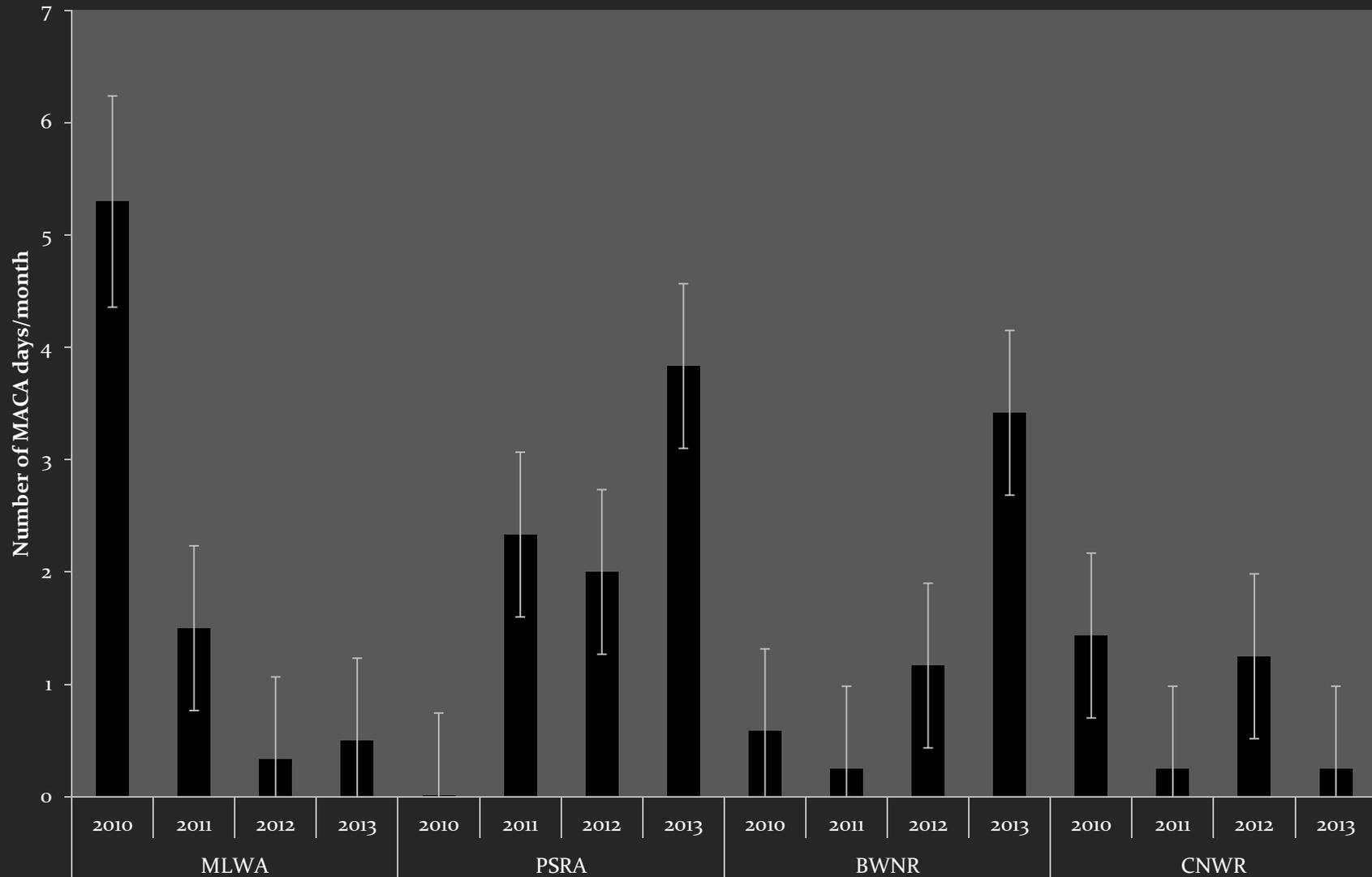
Western Red Bat Yearly Occupancy Rates Per Station



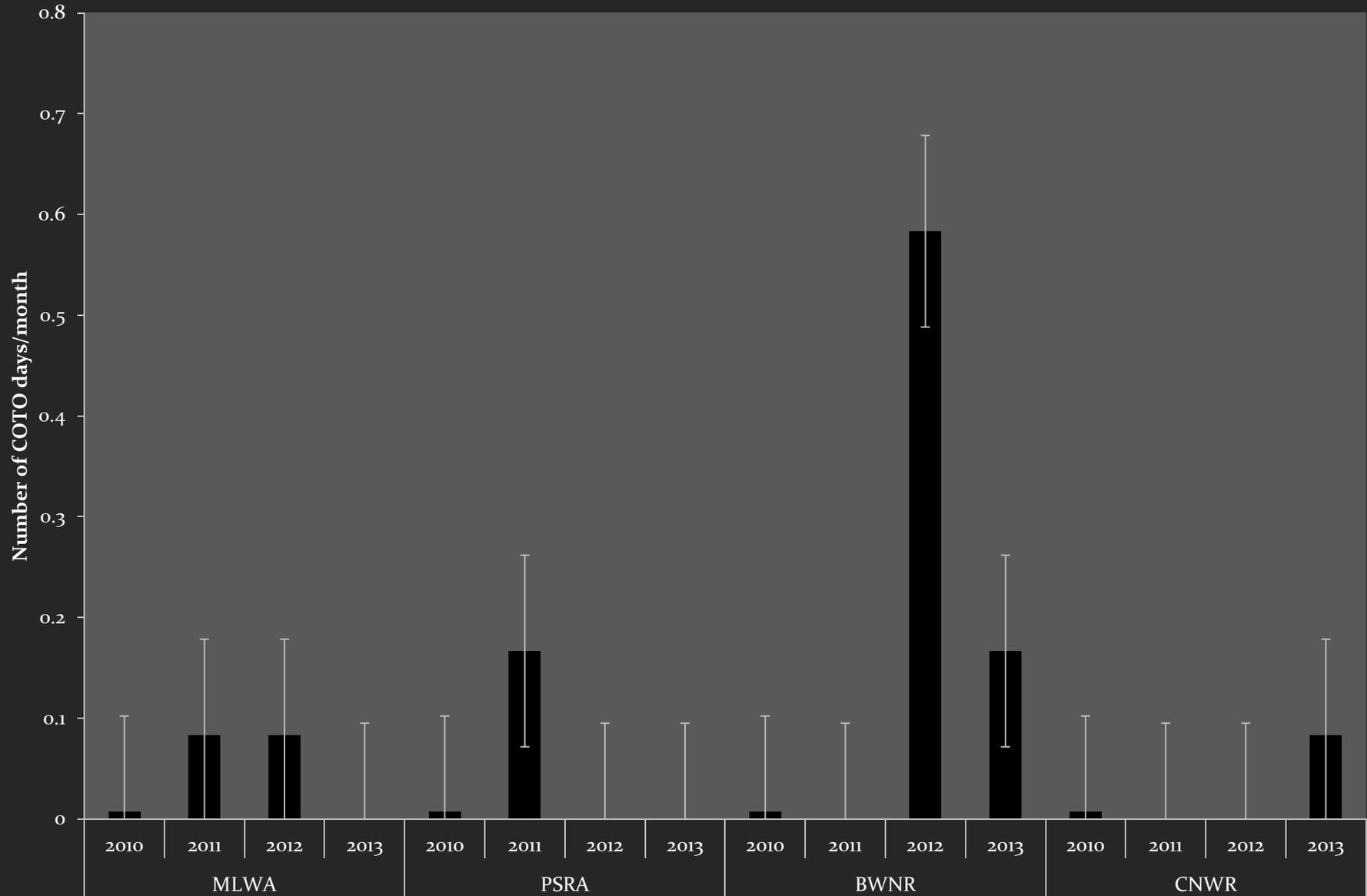
Western Yellow Bat Yearly Occupancy Rates



California Leaf-Nosed Bat Yearly Occupancy Rates



Townsend's Big-Eared Bat Yearly Occupancy Rates



Discussion/Take Home

- Occupancy and Call Minute analysis
 - Western Yellow Bat Migration Pulses.
- Occupancy
 - Western Red Bat Occupancy BWRNWR
 - Western Yellow Bat Occupancy BWRNWR and MLWA
 - Slight Temporal Declines in Western Red/Yellow Bat Occupancy
- Speculation
 - Western Red/Yellow Bats shifting activity to maturing restoration areas

Acknowledgements

- Allen Calvert Bureau of Reclamation
- Susan Broderick Bureau of Reclamation
- Lin Piest Arizona Game and Fish Department



Questions

