Lower Colorado River Multi-Species Conservation Program

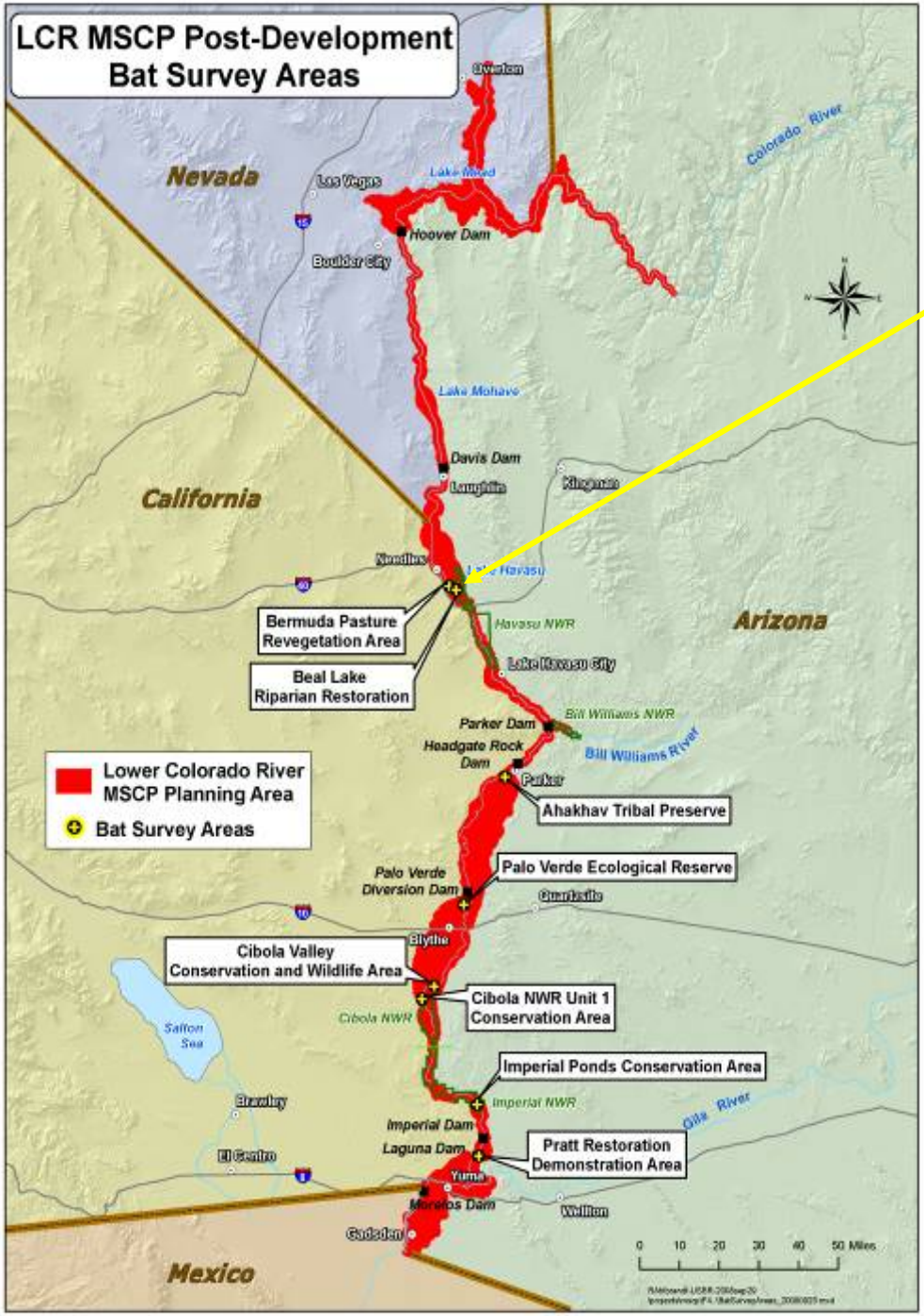
Balancing Resource Use and Conservation

Post Development Bat Monitoring

2008 Results

Goals

- Distribution & habitat use
- Changes in bat activity as habitats mature
- Management guidelines
- Adaptive management



MONITORING AREAS

Beal Riparian and Marsh Restoration Area

Ahakhav Preserve

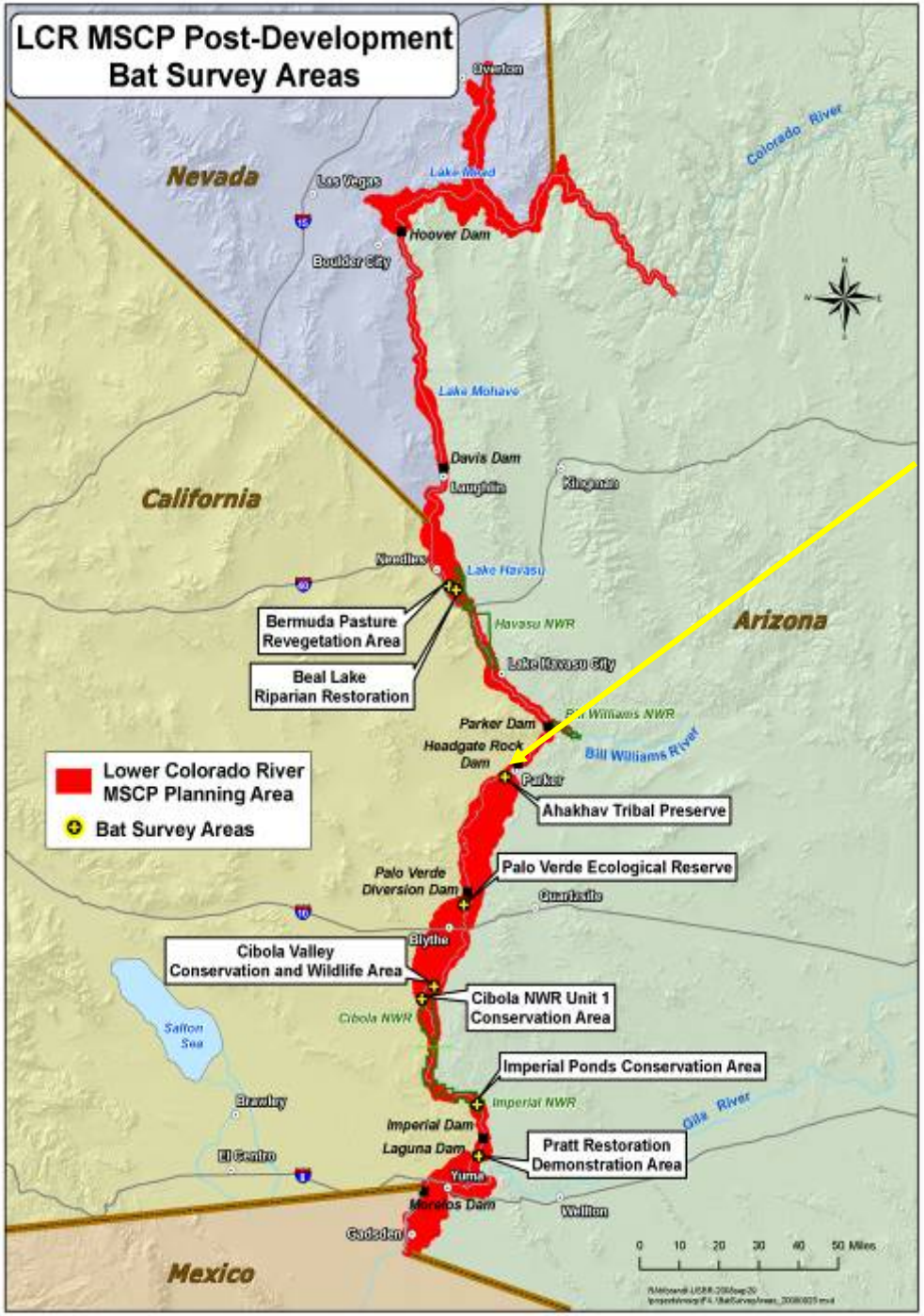
Palo Verde Ecological Reserve

Cibola Valley Conservation Area

Cibola National Wildlife Refuge Unit #1

Imperial Ponds Conservation Area

Pratt Restoration Area



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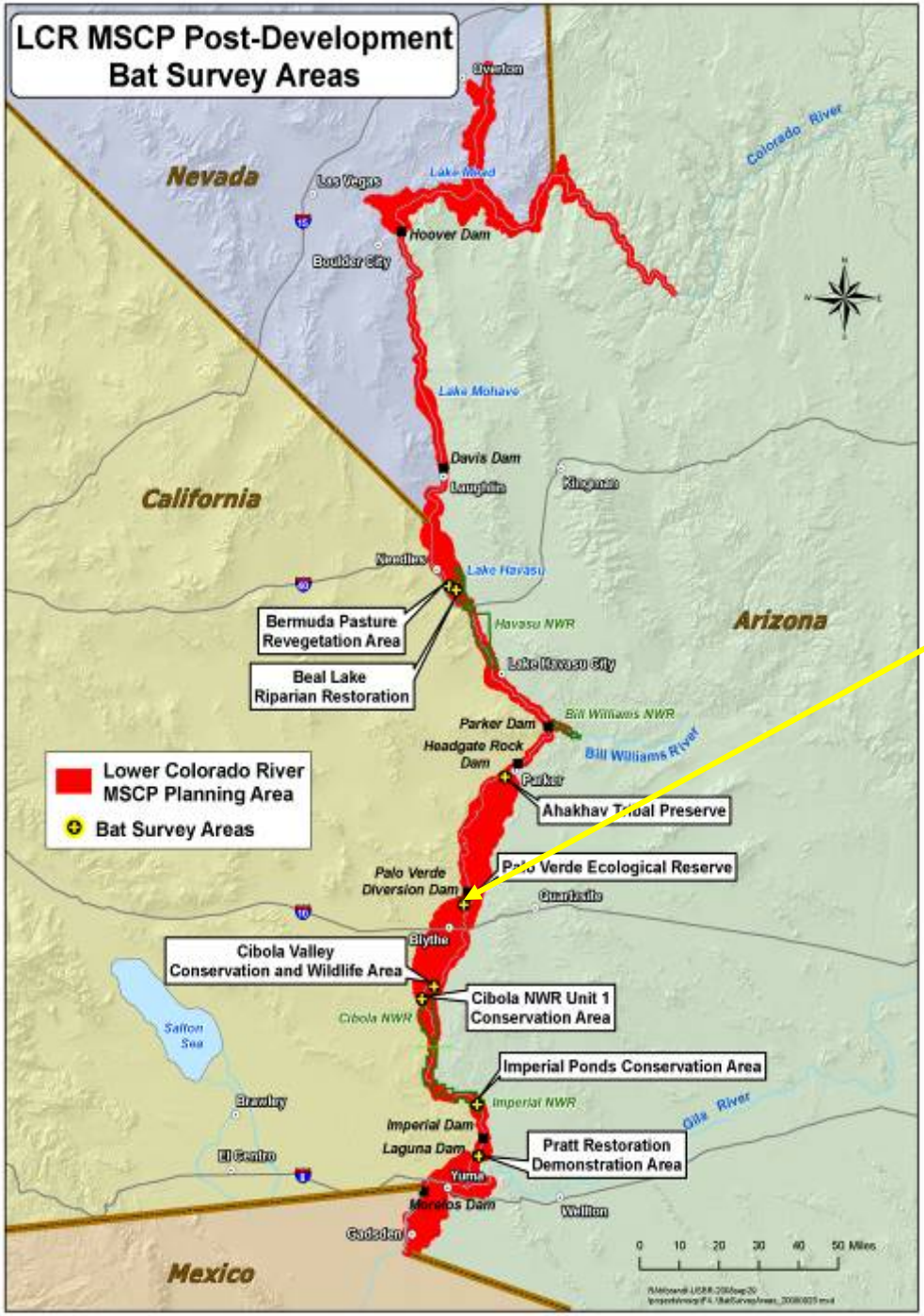

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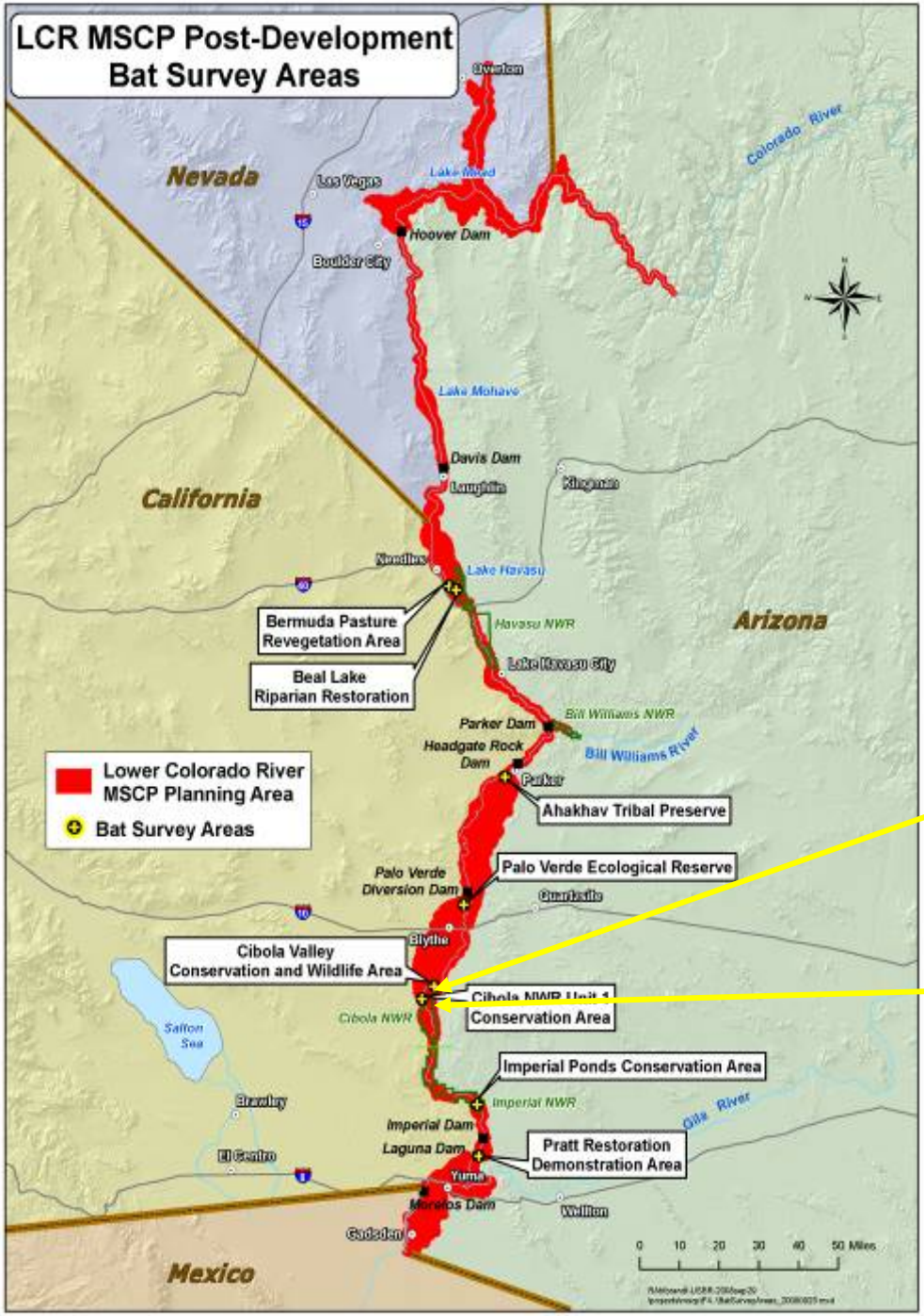

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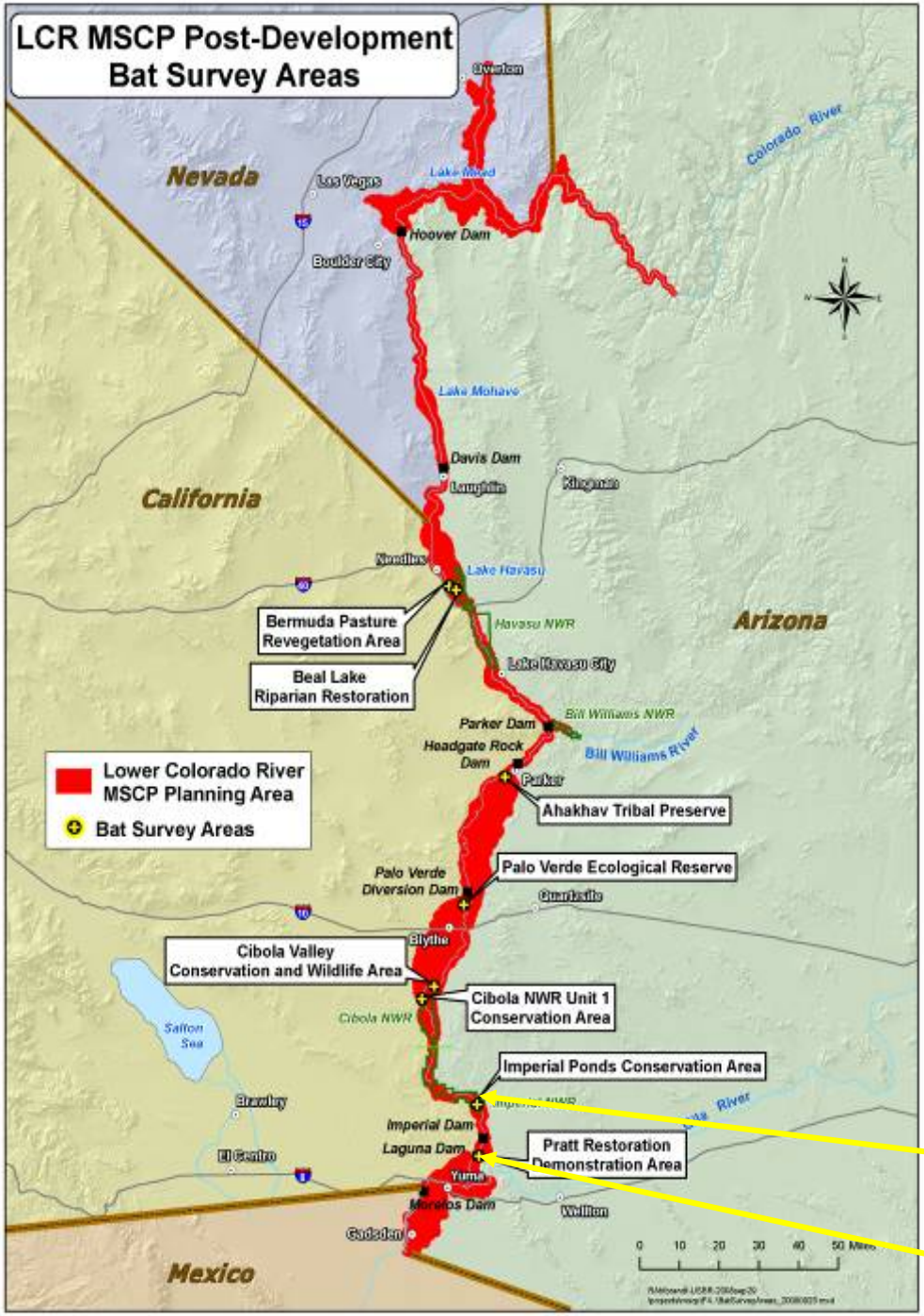

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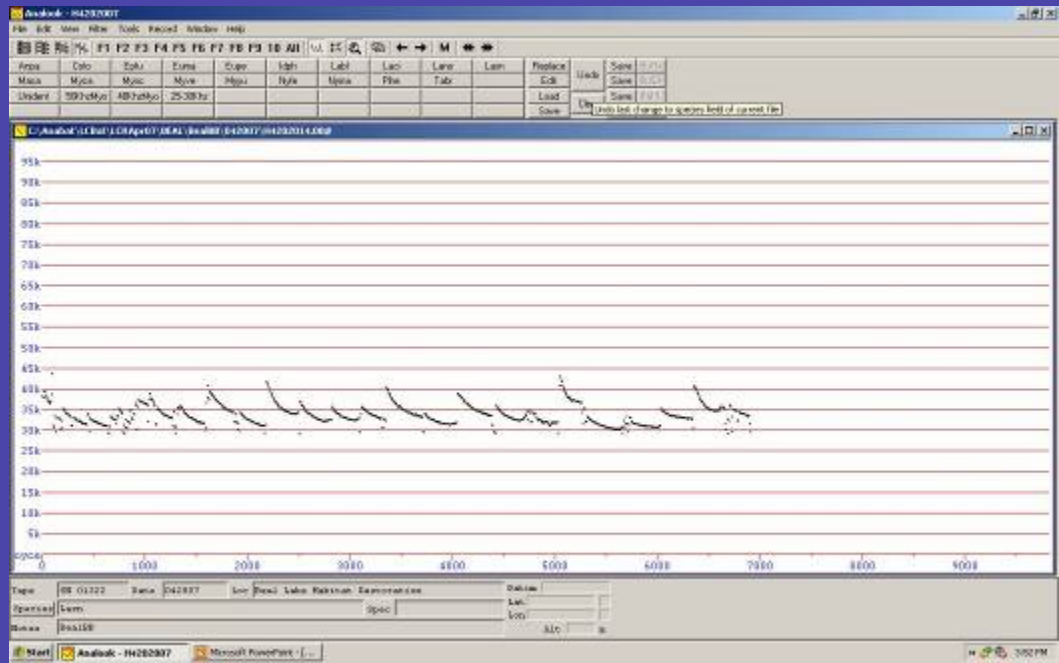
Acoustic Monitoring

Anabat SD1 Bat Detector

Because individual bats cannot be identified index of bat activity used to determine use

Echolocation calls recorded onto CFCs

9 or more units deployed simultaneously – insures variation in conditions affecting activity consistent among sampling sites



Study Design

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- CVCA/CNWR#1 and Imperial Ponds/Pratt combined to provide adequate sample
- At least 3 of the 5 habitat types are monitored per study area
- 3 bat detectors are deployed in each habitat type so that at least 9 detectors are being deployed on any given night
- Surveys conducted for 2 days every quarter at each study area - all 4 seasons are sampled each year

Habitat Types:

"Intermediate" cottonwood-willow plantings - average DBH > than 8 cm

- 'Ahakhav
- CVCA
- Cibola NWR
- Imperial
- Pratt

Habitat Types:

“Sapling” cottonwood-willow plantings - average DBH < than 8 cm

- Beal
- ‘Ahakhav
- PVER
- CVCA

Habitat Types:
Mesquite plantings - average canopy height ≥3 m

- Beal
- ‘Ahakhav
- Cibola NWR

Habitat Types:
Monotypic *Tamarix* spp. stands

- Beal
- PVER
- Imperial
- Pratt

Habitat Types: Agricultural Fields

- PVER
- CVCA
- Cibola NWR
- Imperial
- Pratt

Bat Minutes & the Index of Relative Bat Activity

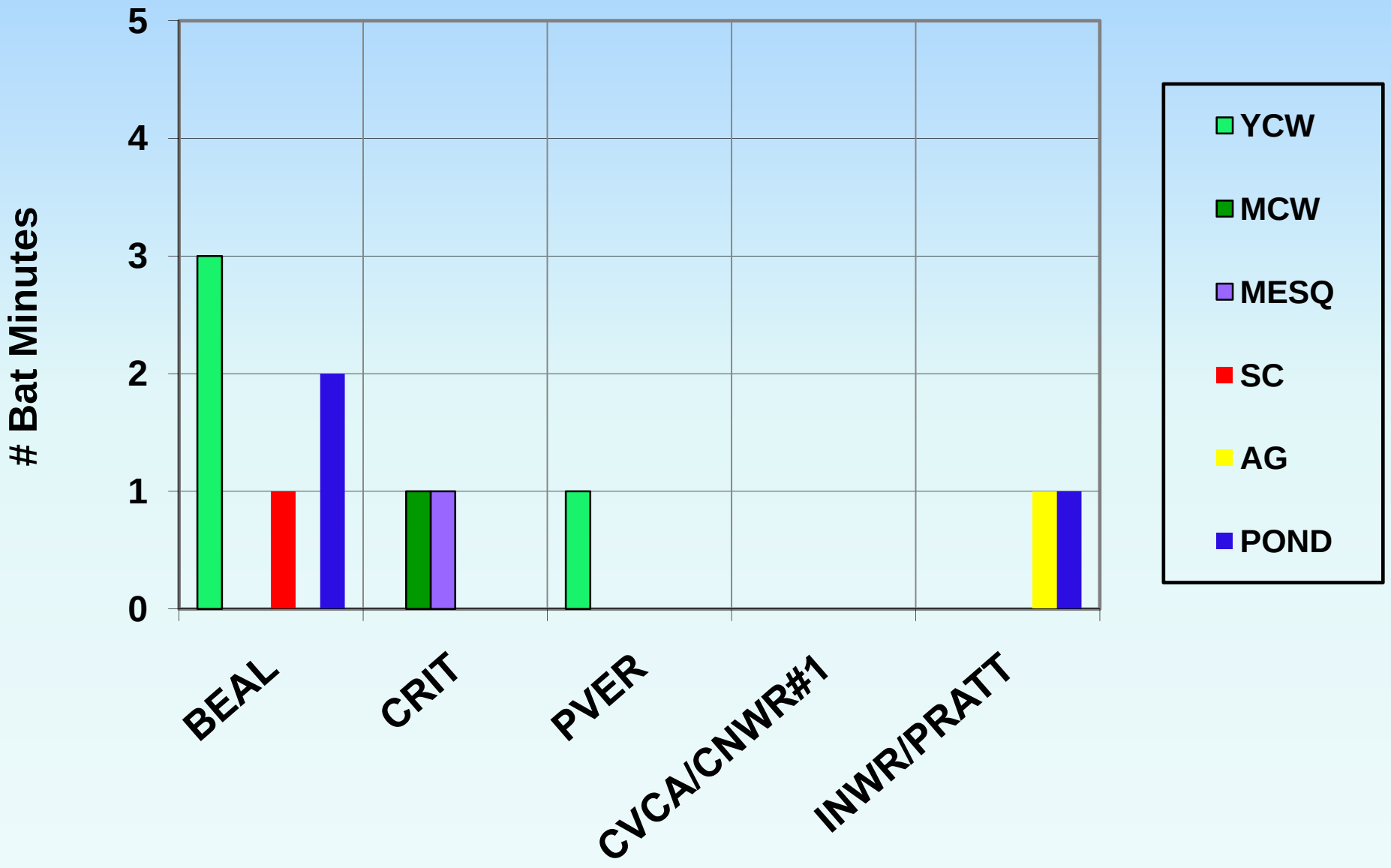
of bat calls converted to bat minutes.

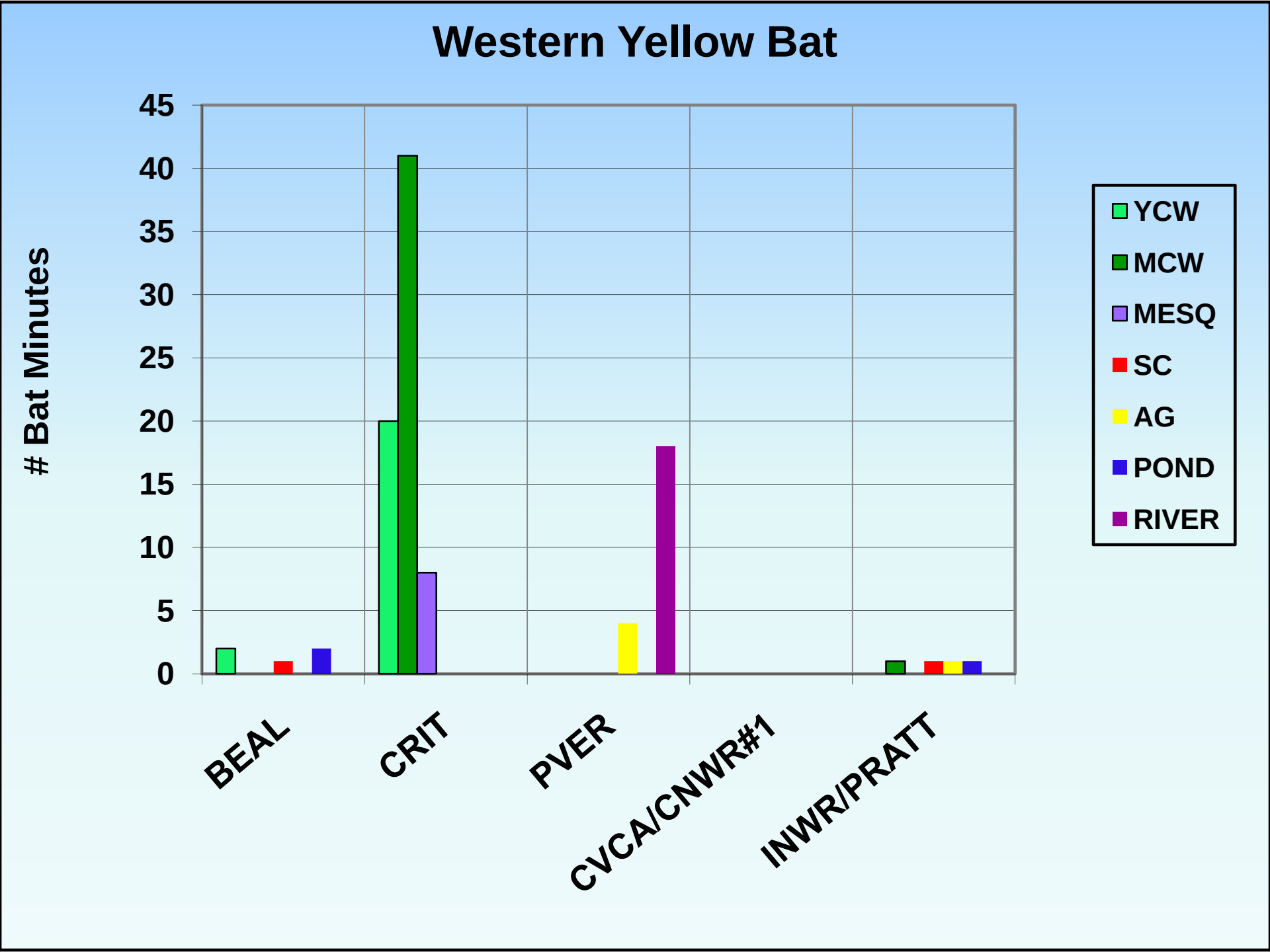
The highest rating a bat species can have is 60 in an hour indicating that the species (but not necessarily the same individual) is recorded continuously during the hour.

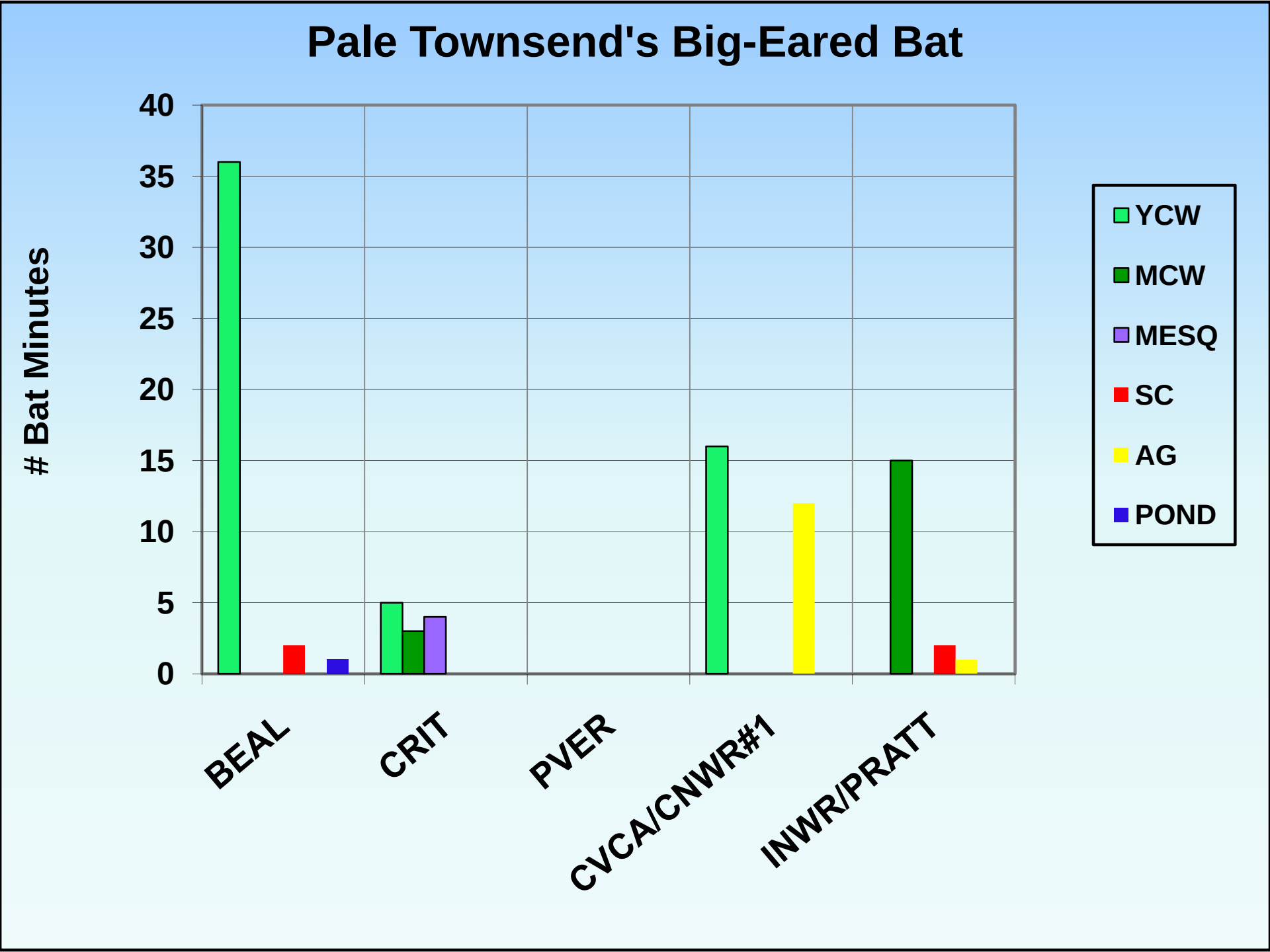
A call minute indicates that a given species is present if it is recorded within that minute.

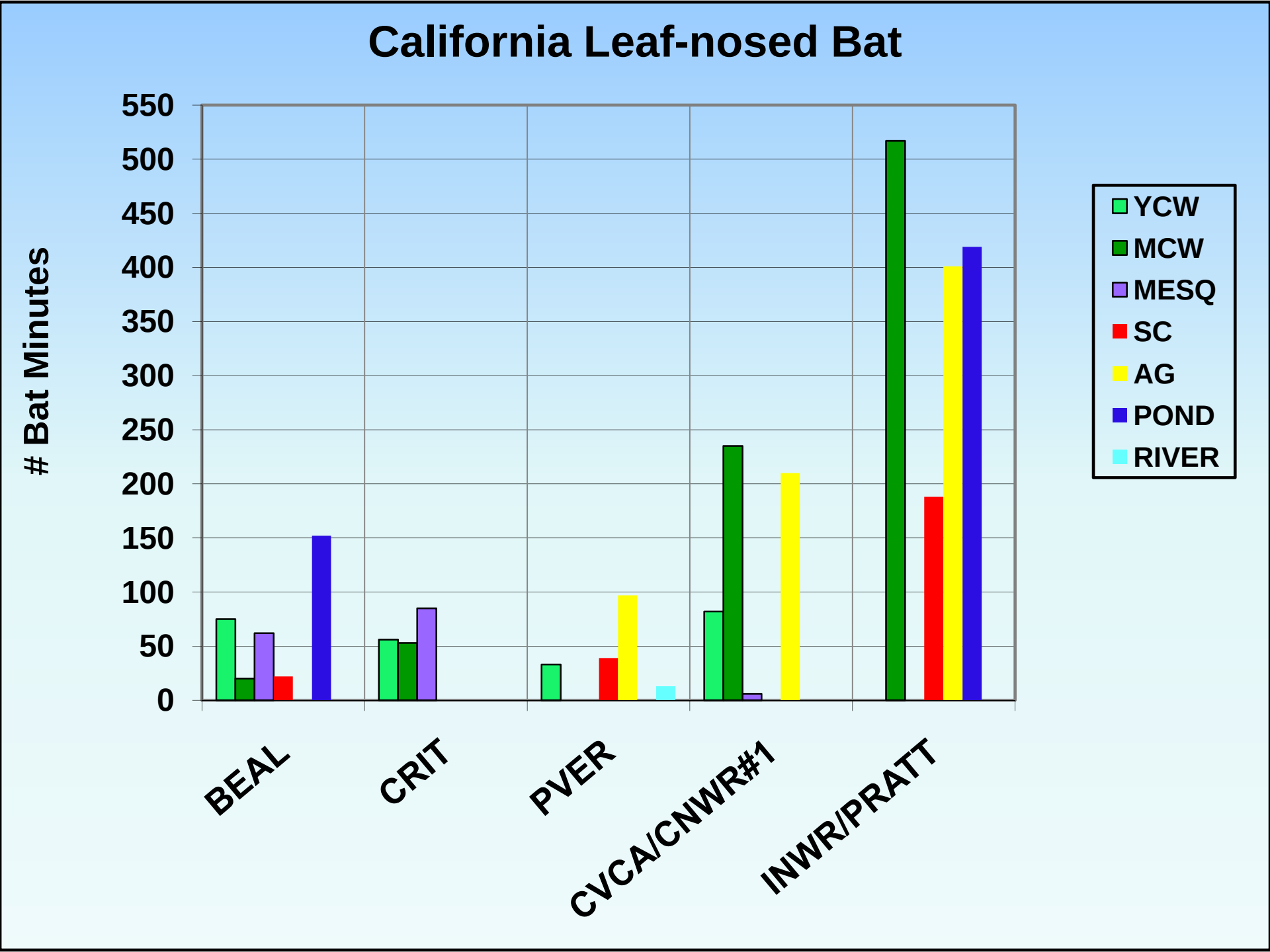
Index of Relative Bat Activity eliminates bias of overestimating bat relative abundance if multiple files of the same individual recorded in a short time period – or underestimating bat abundance when multiple individuals are recorded within a single file.

Western Red Bat




Western Yellow Bat
Bat Minutes
45
40
35
30
25
20
15
10
5
0
BEAL
CRIT
PVER
CVCA/CNWR#1
INWR/PRATT
YCW
MCW
MESQ
SC
AG
POND
RIVER


Pale Townsend's Big-Eared Bat
Bat Minutes
40
35
30
25
20
15
10
5
0
BEAL
CRIT
PVER
CVCA/CNWR#1
INWR/PRATT
YCW
MCW
MESQ
SC
AG
POND


California Leaf-nosed Bat
Bat Minutes
550
500
450
400
350
300
250
200
150
100
50
0
BEAL
CRIT
PVER
CVCA/CNWR#1
INWR/PRATT
YCW
MCW
MESQ
SC
AG
POND
RIVER

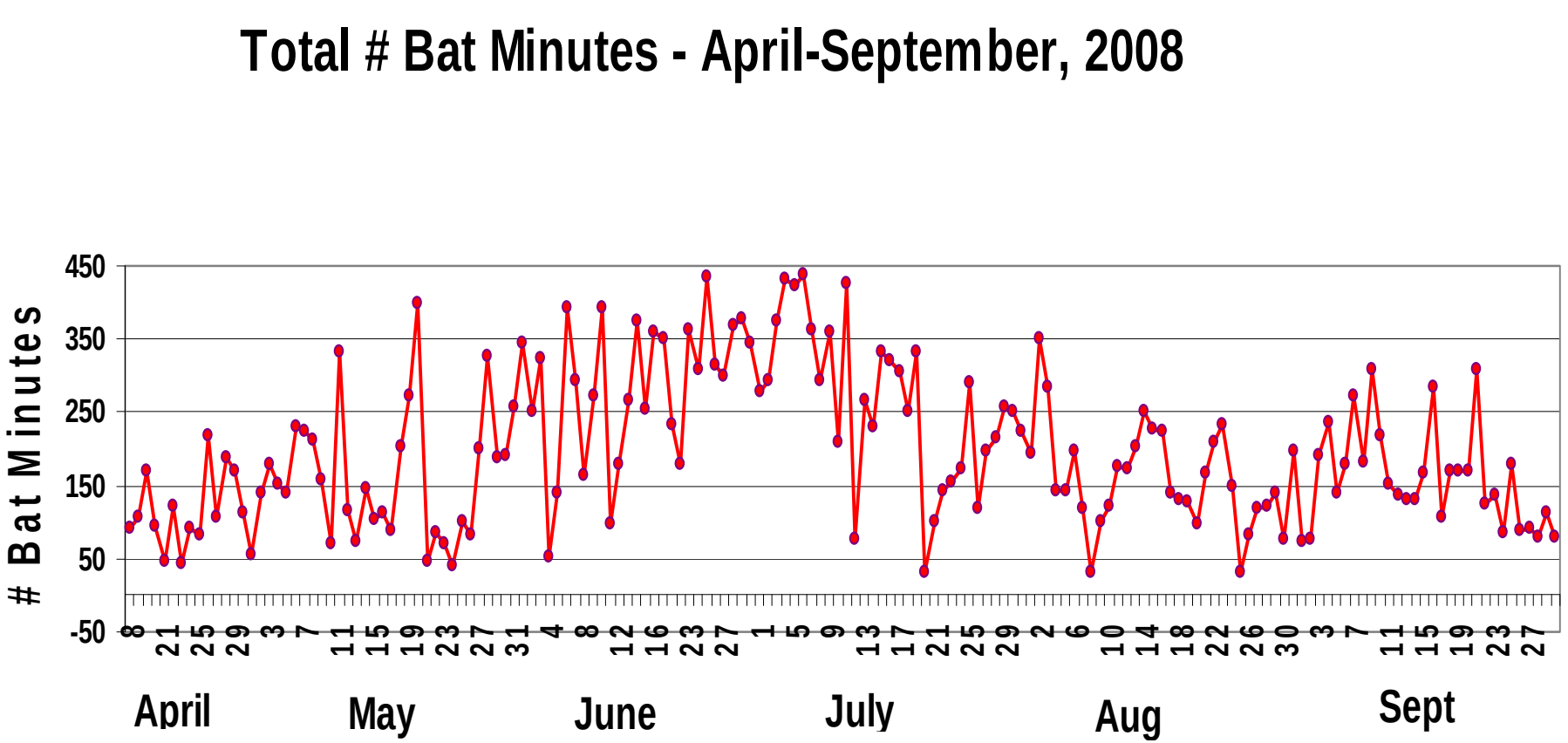
Beal Permanent Anabat Station

- 12-volt battery recharged by solar panel
- 1-GB flash card lasts over a month before downloading

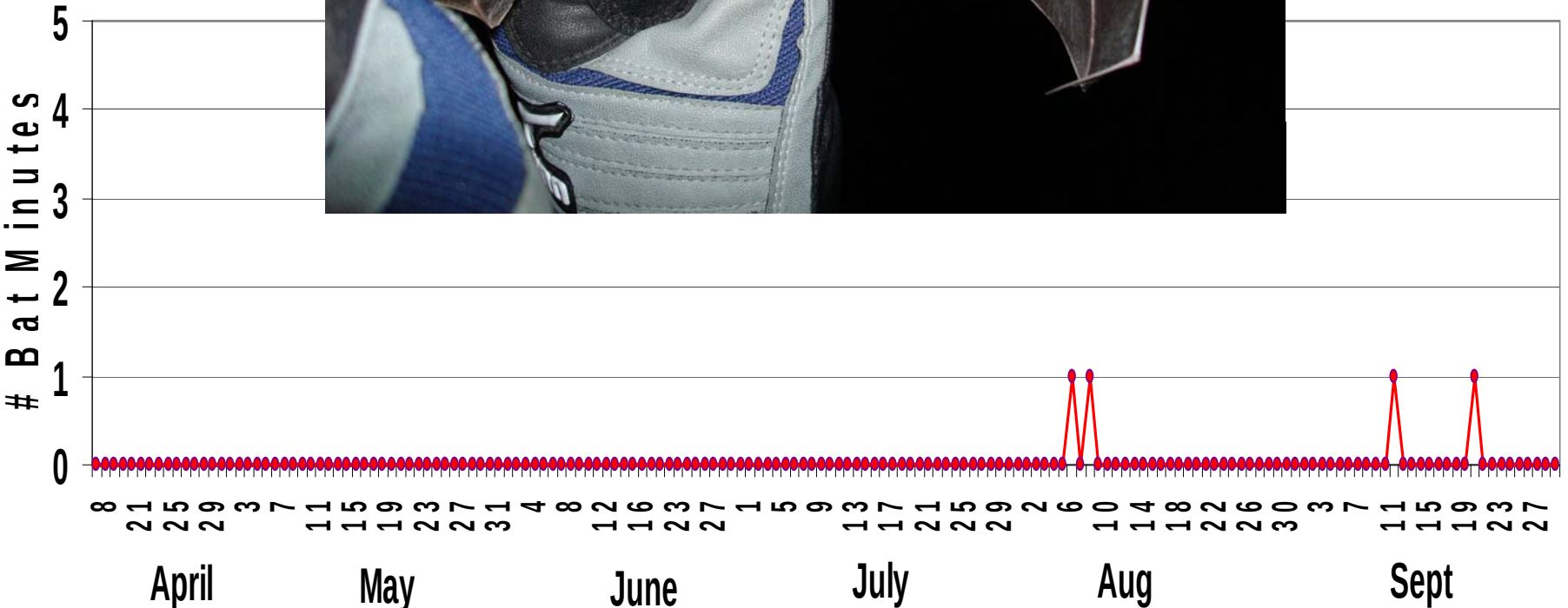
Benefits of a Permanent Station

- Variation at multiple scales:

  Nightly, seasonally (migration), and annually
- Rare species - higher likelihood of detection



Western Yellow Bat



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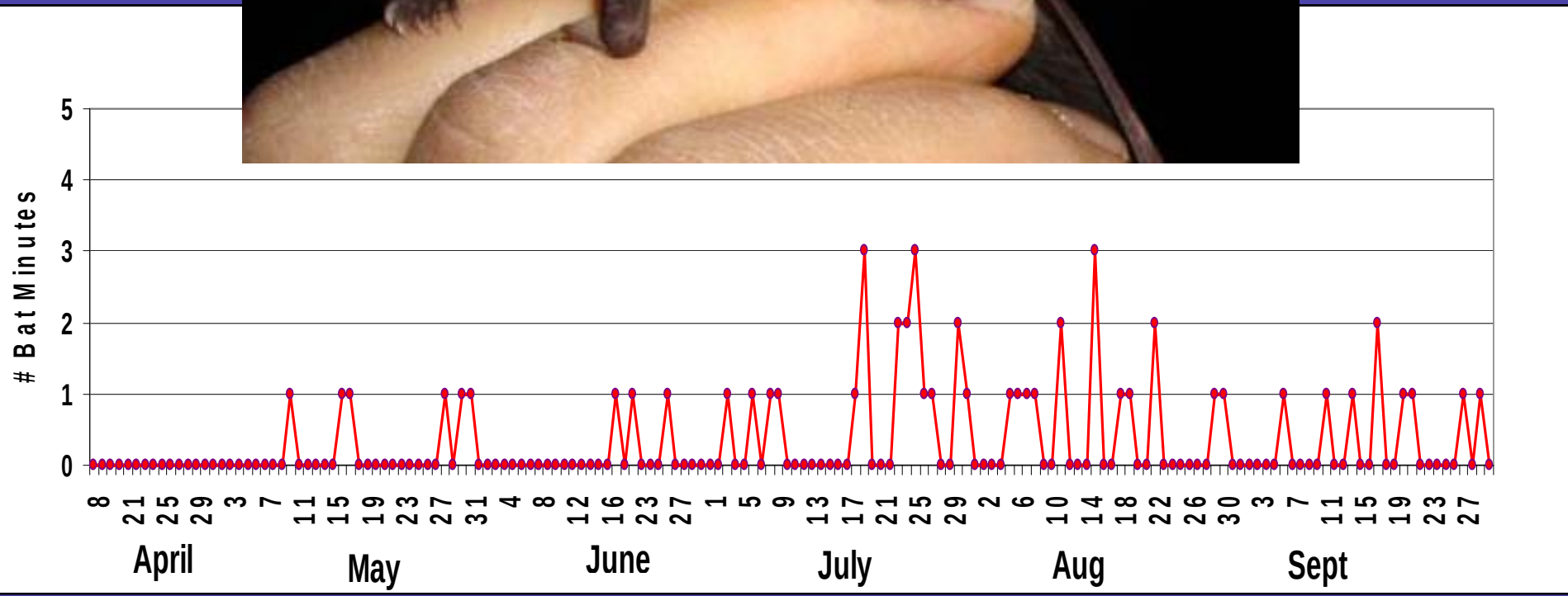
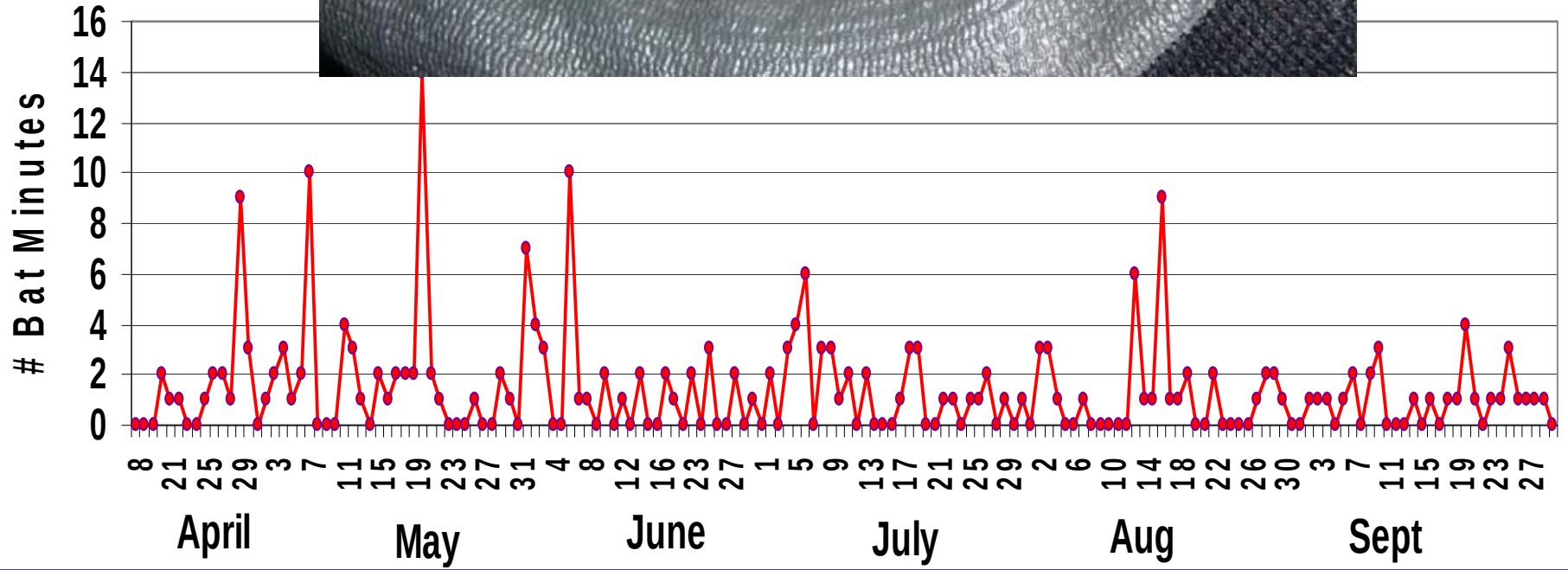
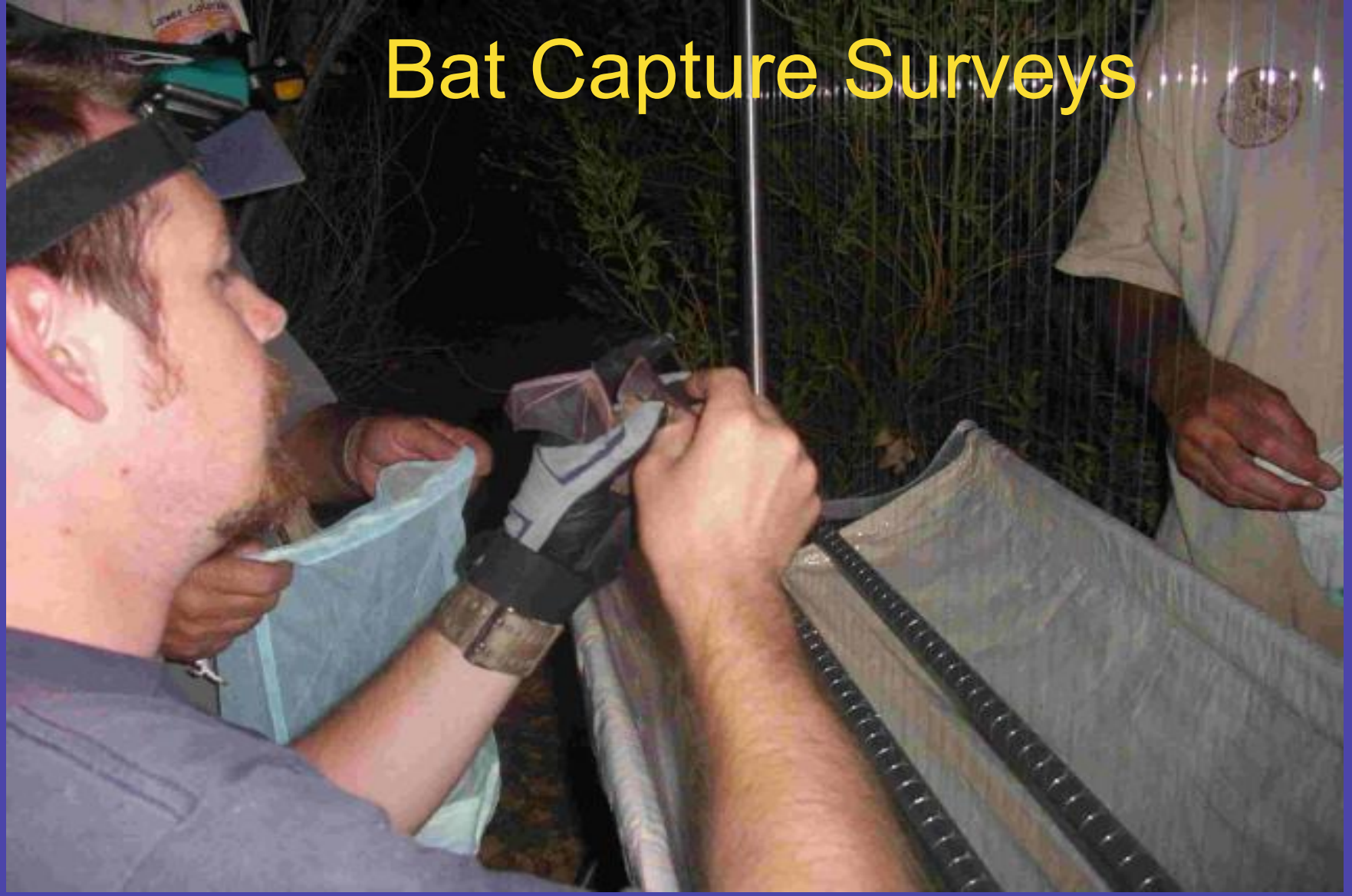


California Leaf-nosed Bat



Bat Capture Surveys



Complements Acoustic Surveys

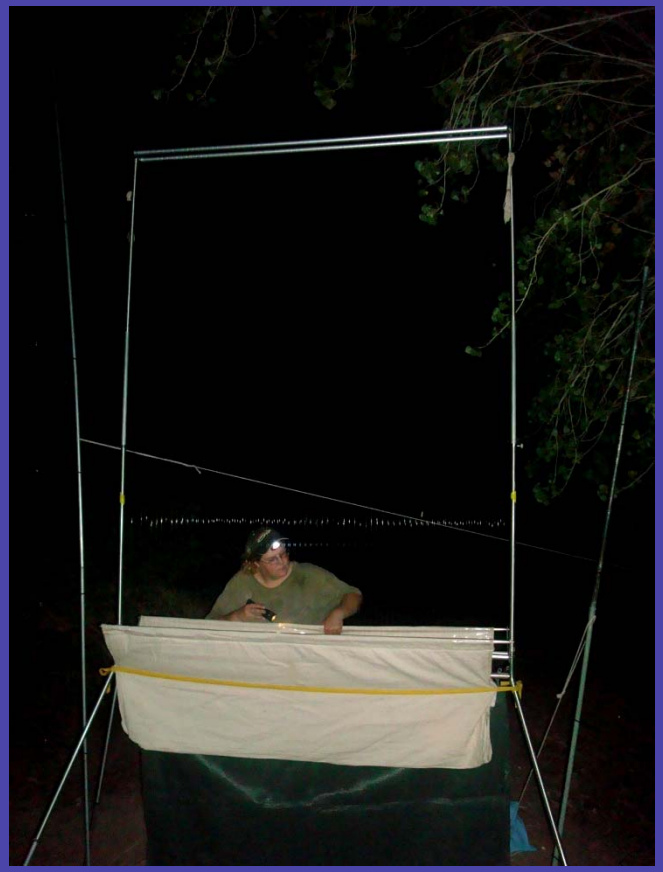
Provides Data on Sex, Age & Reproductive Condition

Acoustic voucher calls

Observational habitat use

- 5 sites surveyed
- 22 nights
- 8 species captured
- 2 MSCP covered species

Mist-nets and harp traps placed in corridors or flyways in a habitat creation site – usually near water



Data Collected

- Sex
- Age
- Reproductive Status
- Forearm Length
- Tragus Length
- Weight

Bat Capture Surveys

Results from all sites for 2008

Species	Beal N=3	Bermuda Pasture N=4	‘Ahakhav N= 5	Unit 1 N=5	Pratt N=5	Totals
Pallid Bat	2	13	35	13	20	83
Big Brown Bat	0	1	9	13	8	31
Yuma Myotis	8	3	12	0	3	26
California Leaf-nosed	0	0	4	4	5	11
Western Yellow Bat	0	0	4	2	0	6
Cave Myotis	1	2	0	0	0	3
California Myotis	0	0	1	3	0	4
Myotis spp.	1	0	0	0	0	1
Hoary Bat	0	0	0	2	0	2
Totals	12	19	65	37	36	167

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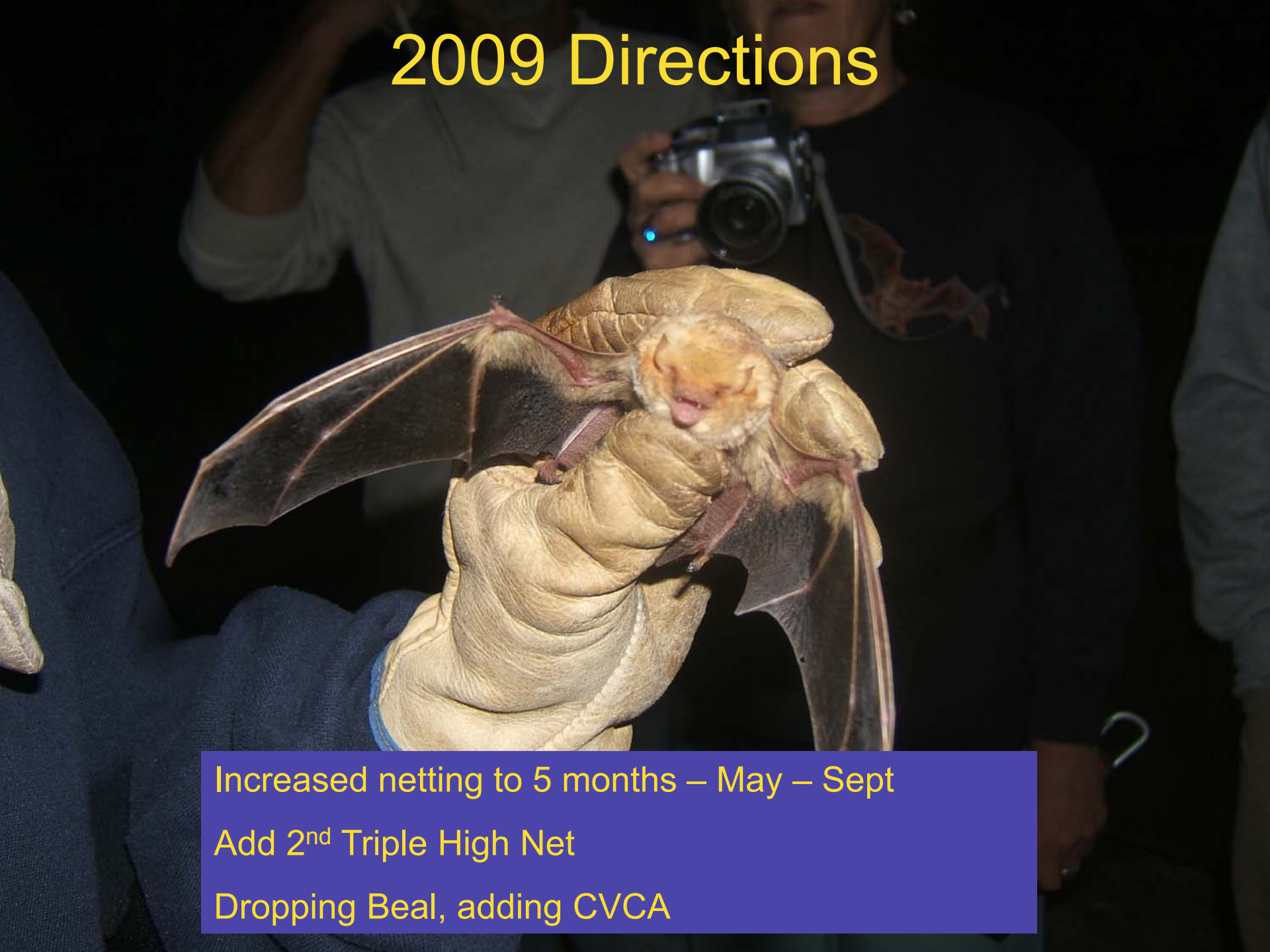
2009 Directions



Increased netting to 5 months – May – Sept

Add 2nd Triple High Net

Dropping Beal, adding CVCA

Detector placement to avoid insect noise

Sonobat technology may improve call I.D.

Add permanent bat station at CRIT


Questions?