

DETERMINING THE FORAGING RANGES OF CALIFORNIA LEAF-NOSED BATS ALONG THE LCR

Patricia Brown and William Rainey
Bishop and Berkeley, California



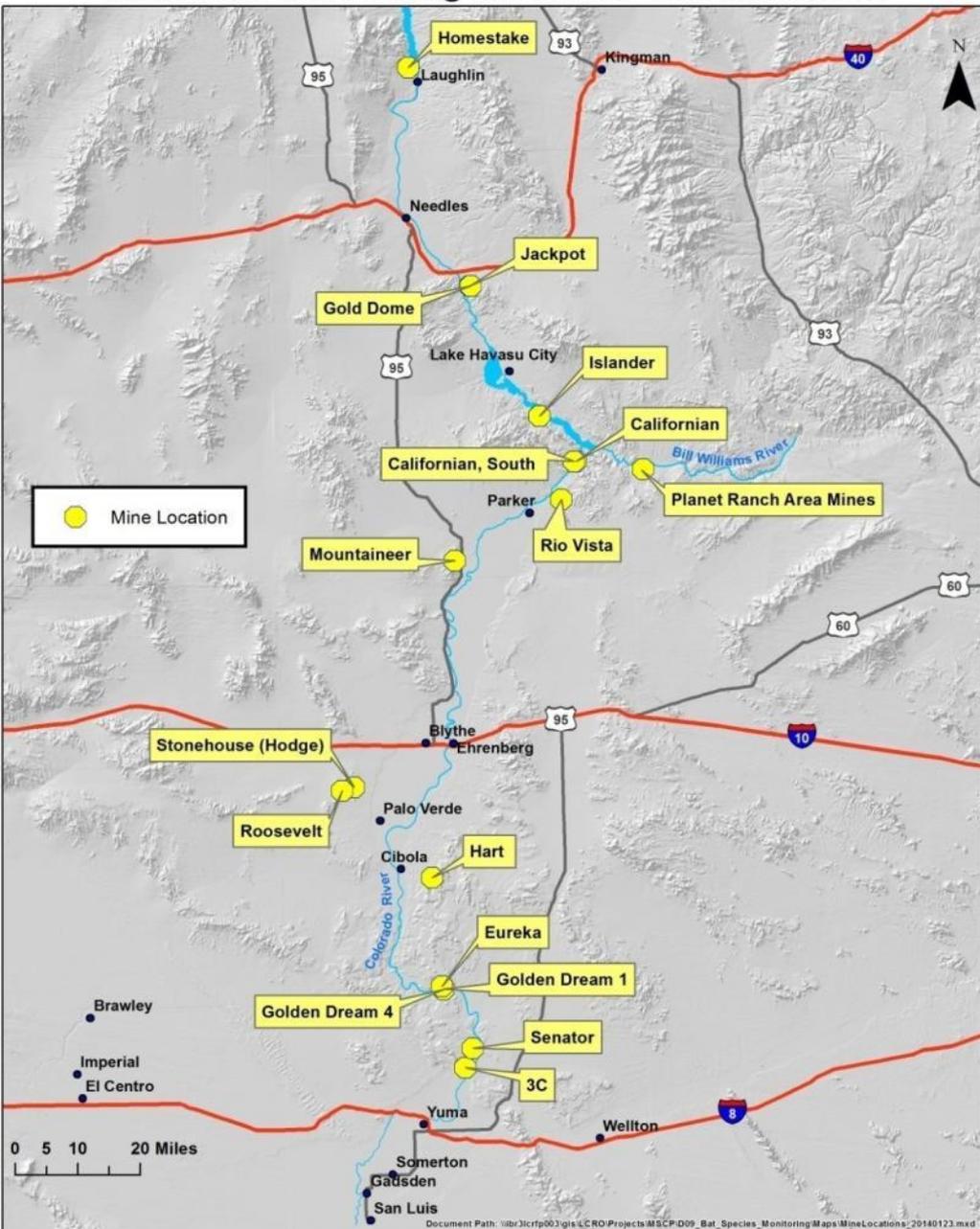


Known California leaf-nosed bat roosts

California leaf-nosed bat foraging habitat and prey



Mine Locations Along the Lower Colorado River



Distances between Conservation Areas and Mines

MINE NAME	MSCP PROJECT	MILES BETWEEN
Mountaineer	Ahakhav Tribal Preserve	10.97
Rio Vista	Ahakhav Tribal Preserve	8.01
Jackpot	Beal Lake Conservation Area	7.25
Gold Dome	Beal Lake Conservation Area	7.31
Stonehouse (Hodge)	Cibola Valley Conservation Area	9.13
Roosevelt	Cibola Valley Conservation Area	10.08
Hart	Cibola NWR Nature Trail	7.20
Roosevelt	Cibola NWR Nature Trail	12.71
Stonehouse (Hodge)	Cibola NWR Nature Trail	11.89
Mountaineer	Palo Verde Ecological Reserve	21.61

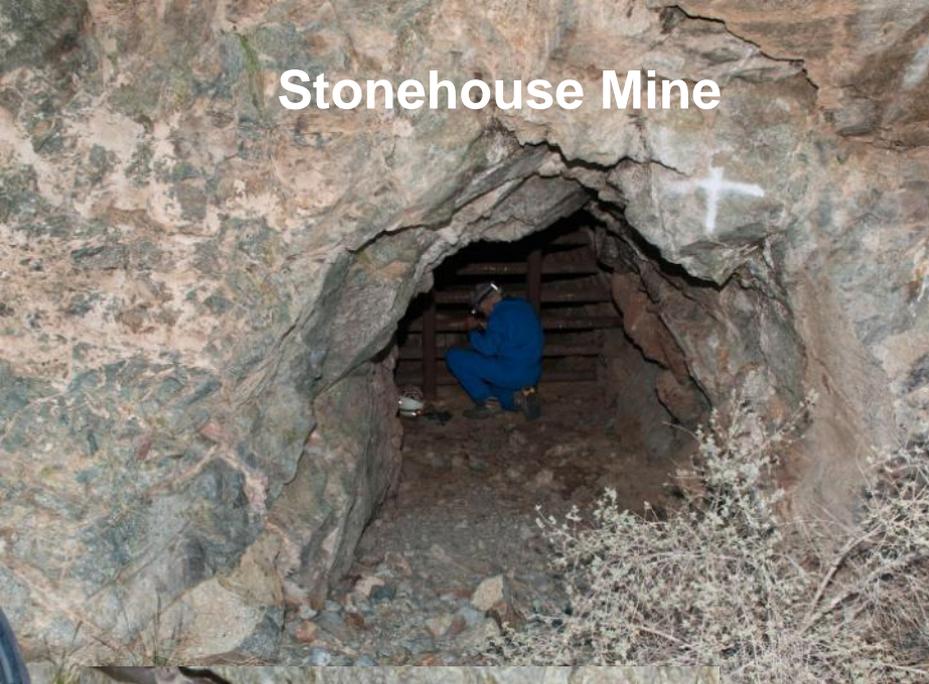
Foraging Distance Surveys

- Mist netting in MSCP Conservation Areas capture CA leaf-nosed bats
- Some Conservation Areas are >10 miles from known mine roosts
- Bats are travelling considerable distances to forage in restoration sites or there are unknown mine roosts closer to MSCP Conservation Areas

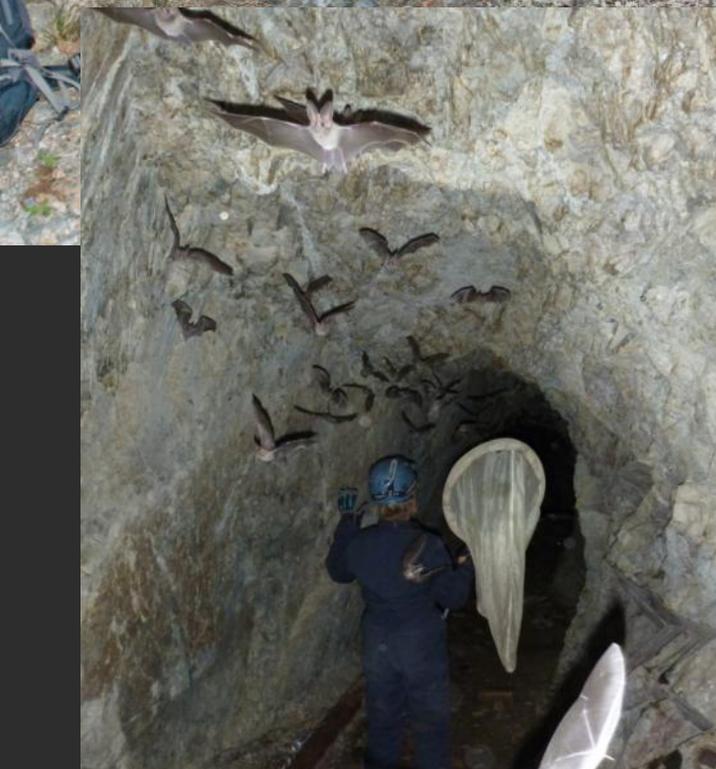
TELEMETRY METHODS

- REMOTE SCANNING AND LOGGING RECEIVERS PLACED NEAR ROOSTS & IN CONSERVATION AREAS
- DIURNAL AND NOCTURNAL RETRIEVAL OF SHED TRANSMITTERS
- NIGHT GROUND TRACKING FROM FIXED AND MOBILE STATIONS AND TRIANGULATION
- NOCTURNAL AERIAL TRACKING WITH CESSNA 172
- BATS MIST NETTED AT CONSERVATION AREAS AND TRACKED BACK TO ROOSTS (BACK-TRACKING)

Stonehouse Mine



Bat Capture



Roosevelt Mine

2015/ 8/ 4 20:24



TELEMETRY METHODS

- **REMOTE SCANNING AND LOGGING
RECEIVERS PLACED NEAR ROOSTS & IN
CONSERVATION AREAS**

Remote logging receiver above
Stonehouse Mine



CVCA



Cibola Nature Trail



PVER



TELEMETRY METHODS

- REMOTE SCANNING AND LOGGING RECEIVERS PLACED NEAR ROOSTS & IN CONSERVATION AREAS
- **DIURNAL AND NOCTURNAL RETRIEVAL OF SHED TRANSMITTERS**

Transmitter recovery February 2015





Roosevelt Mine



Shrike attack victims

Jill retrieving transmitters in Roosevelt shaft



TELEMETRY METHODS

- REMOTE SCANNING AND LOGGING RECEIVERS PLACED NEAR ROOSTS & IN CONSERVATION AREAS
- DIURNAL AND NOCTURNAL RETRIEVAL OF SHED TRANSMITTERS
- **NIGHT GROUND TRACKING FROM FIXED AND MOBILE STATIONS AND TRIANGULATION**



TRIMBLE ENTRY

Rattlesnake assistance February 2015



2015/ 2/16 22:01



2015/ 2/16 21:47



Night roost north of CVCA



Night roost near Palo Verde

Night roost in February and August 2015





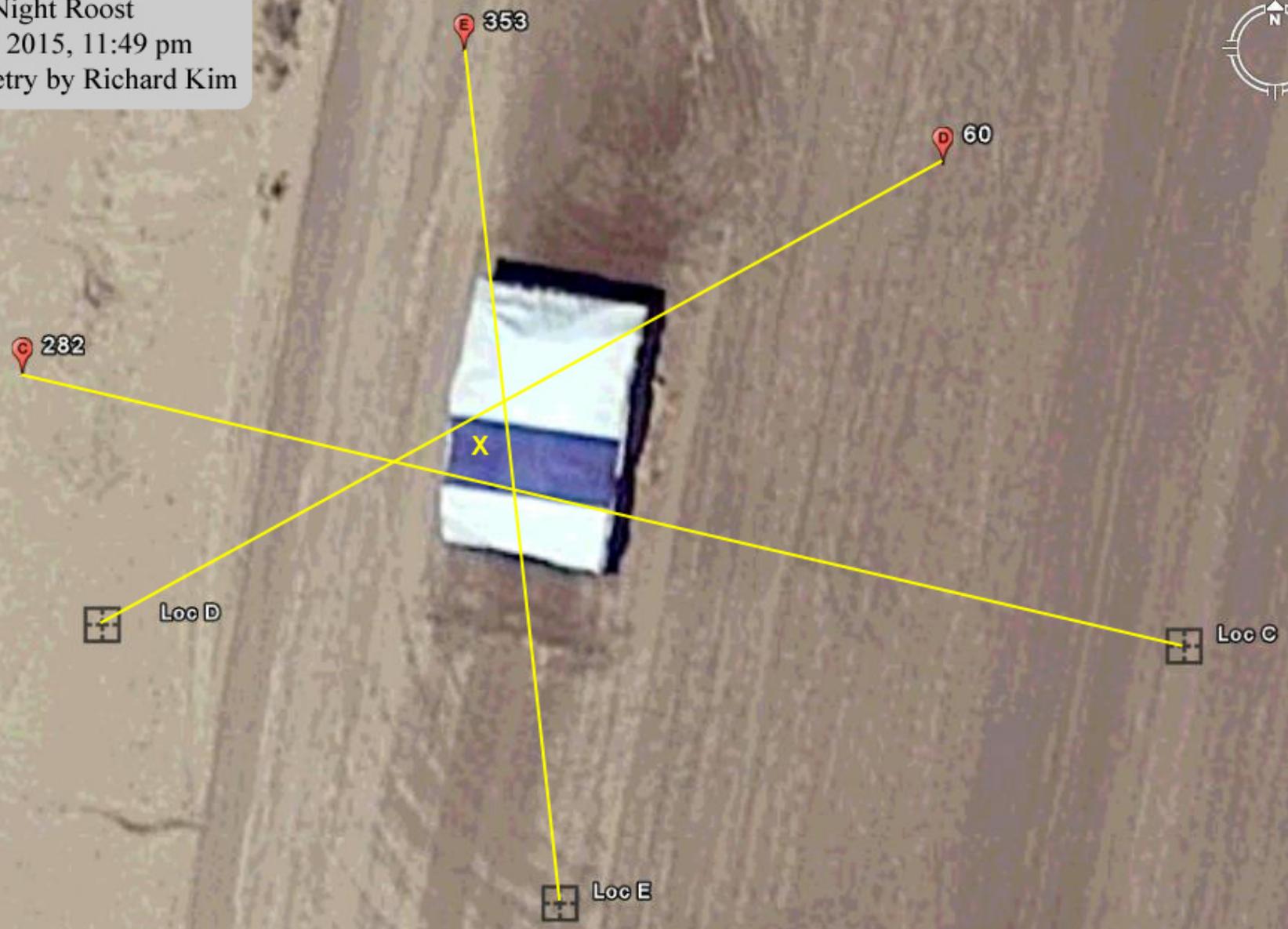
Night Roost in Hay Bales



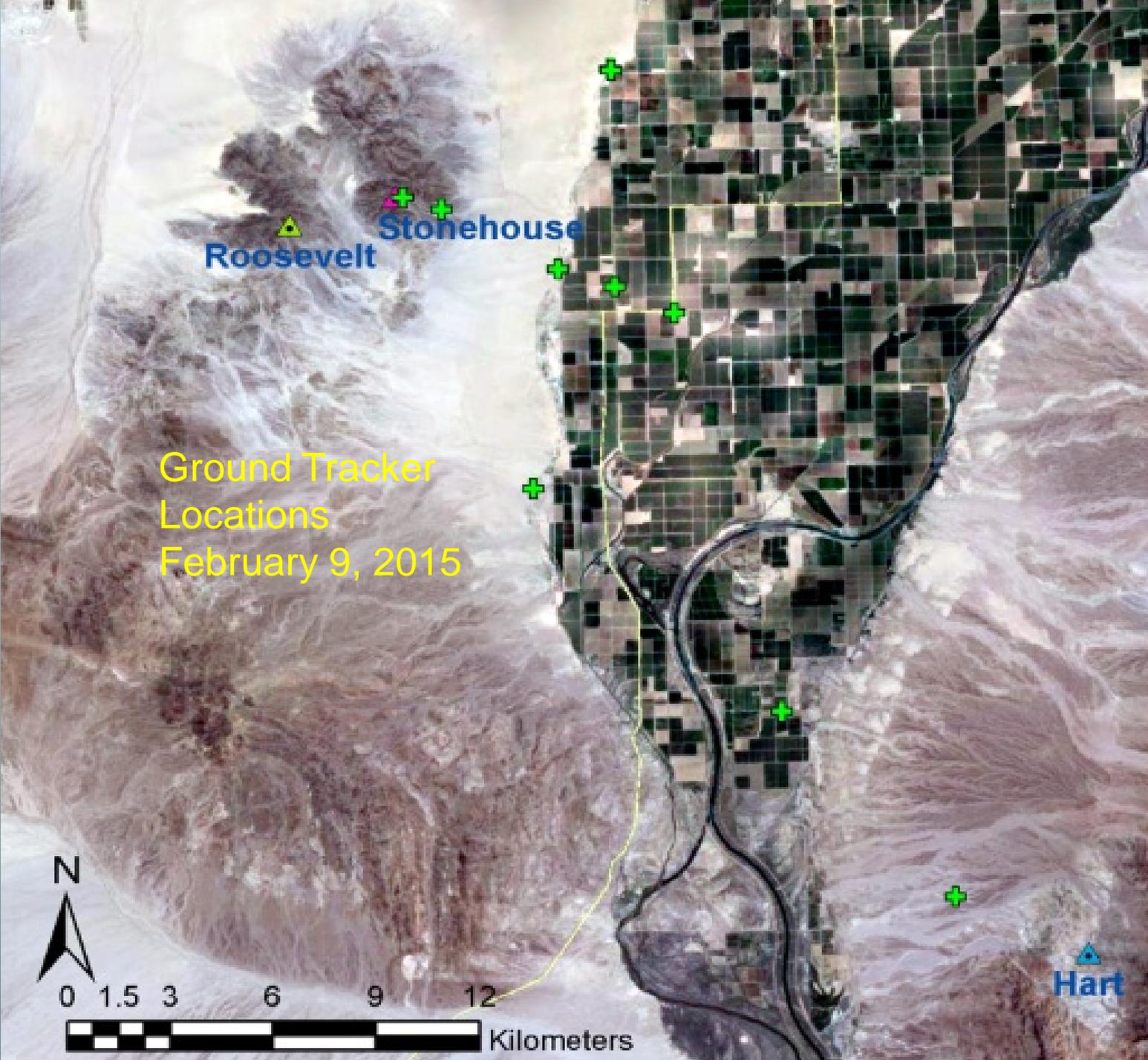
August night and day roost for Bat



Bat 2 Night Roost
15 Aug 2015, 11:49 pm
Telemetry by Richard Kim



X = E 0712974, N 3703269



Roosevelt Stonehouse

Ground Tracker
Locations
February 9, 2015

Hart



Fixed tracking station on edge of interface
between bajada and old floodplain

Stonehouse Mine



Transmitter recovery



2015/ 8/21 17:19



View from fixed station



Interface





Foraging habitats
surrounded by
agriculture



TELEMETRY METHODS

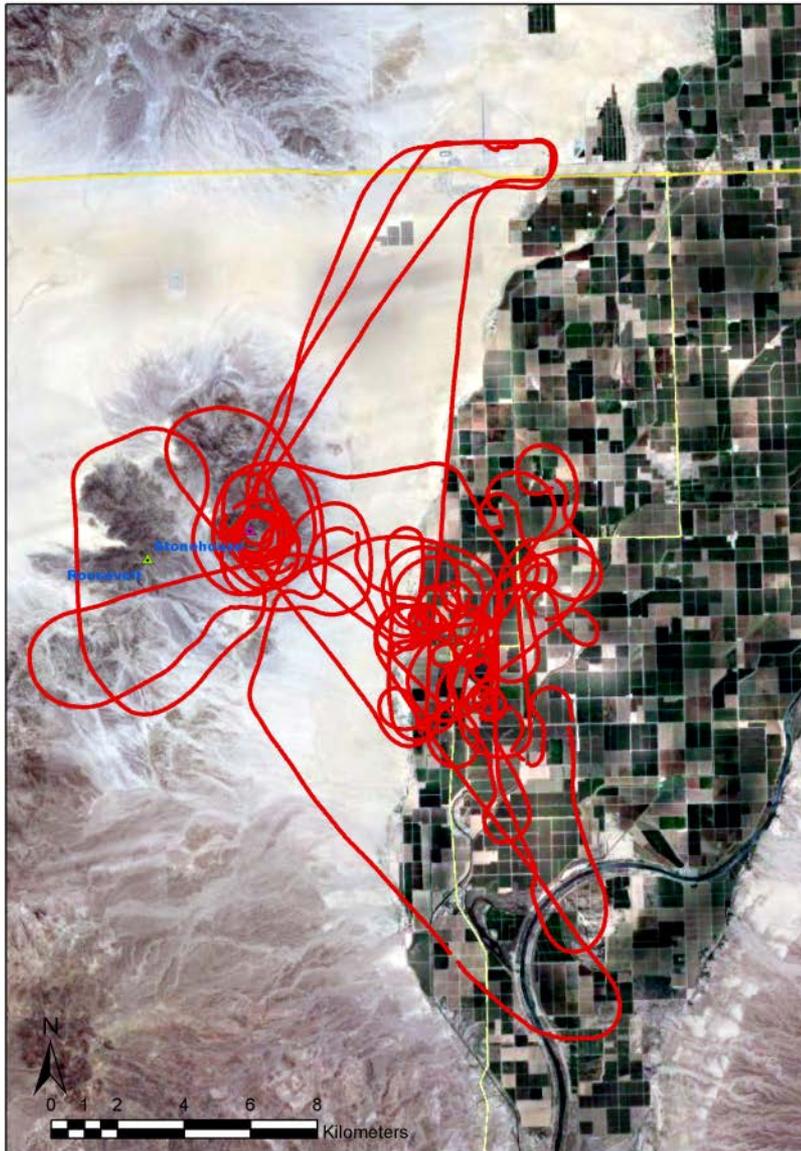
- REMOTE SCANNING AND LOGGING RECEIVERS PLACED NEAR ROOSTS & IN CONSERVATION AREAS
- DIURNAL AND NOCTURNAL RETRIEVAL OF SHED TRANSMITTERS
- NIGHT GROUND TRACKING FROM FIXED AND MOBILE STATIONS AND TRIANGULATION
- **NOCTURNAL AERIAL TRACKING WITH CESSNA 172**



Night Aerial Flights

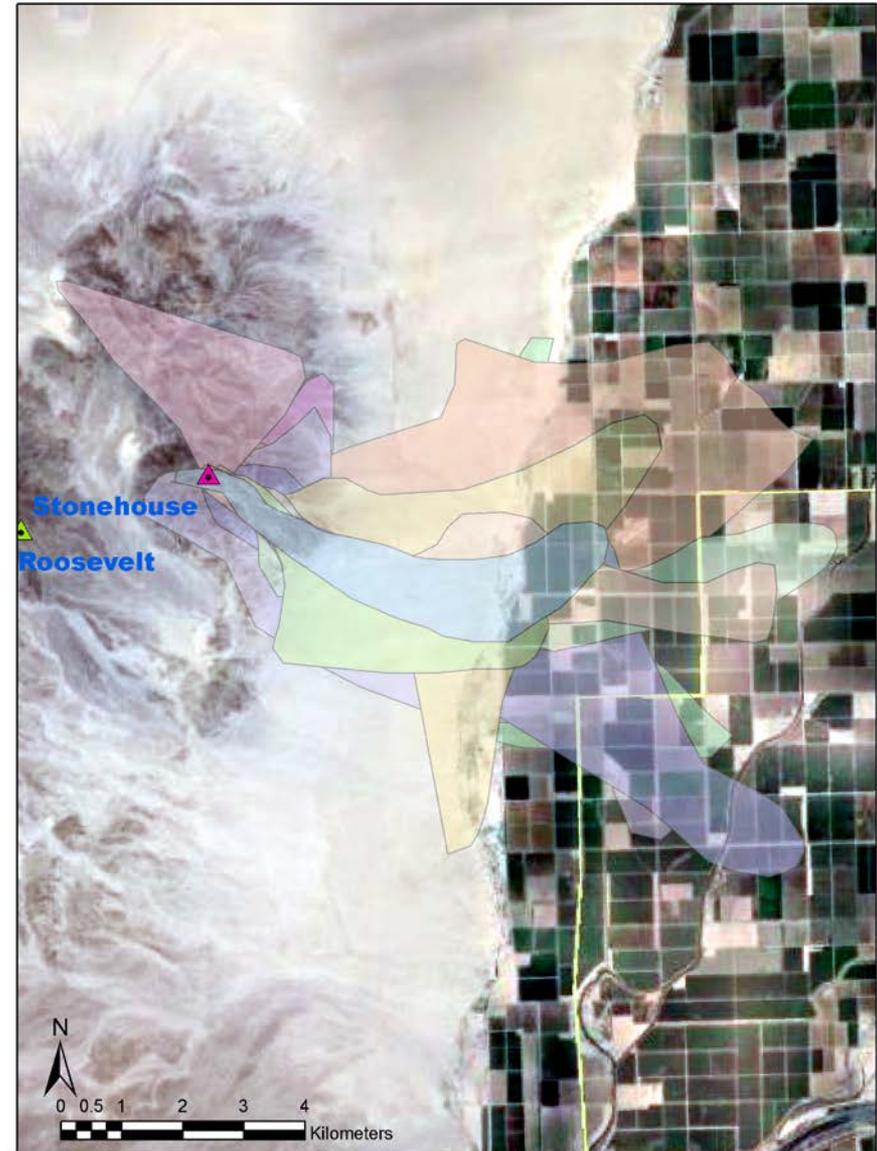


Aerial tracking



February 8, 2015

Estimated bat ranges



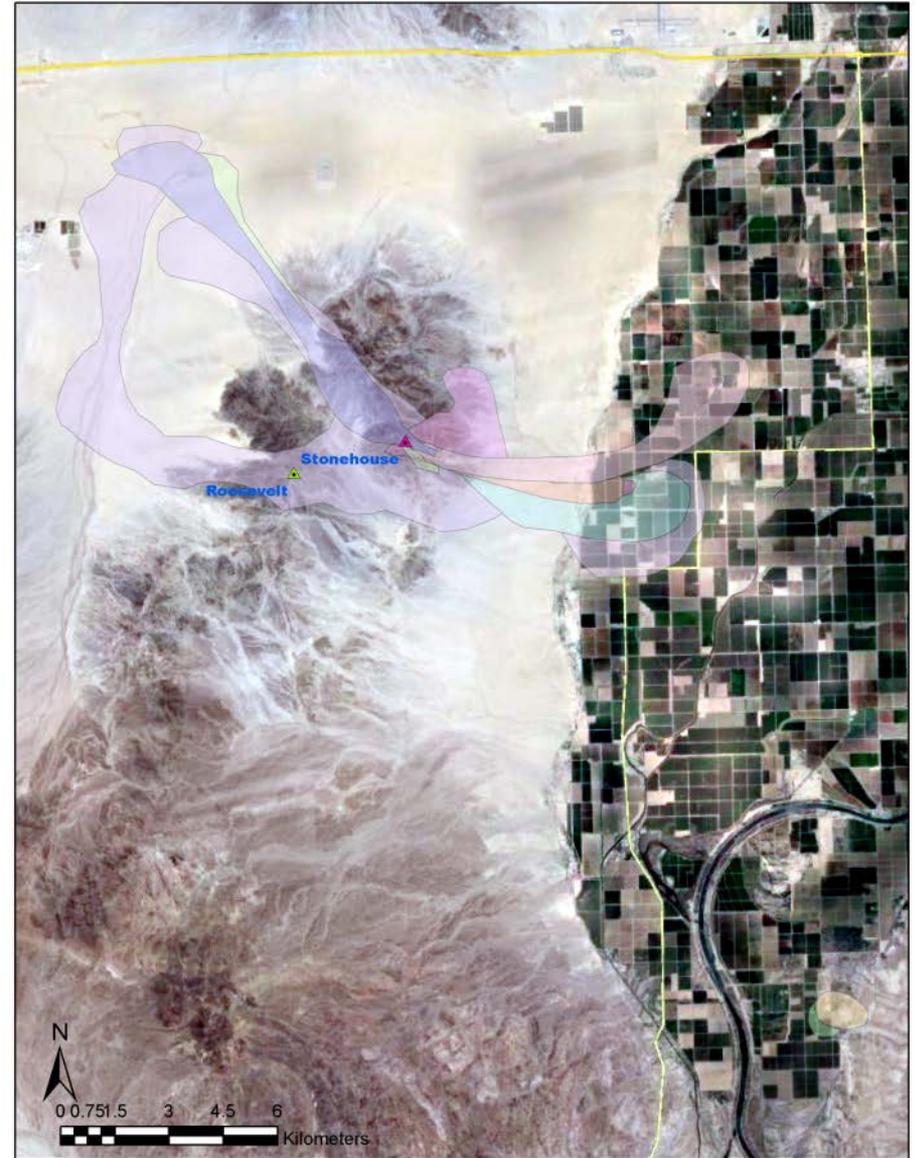
Ground tracking and aerial

Aerial tracking



February 15, 2015

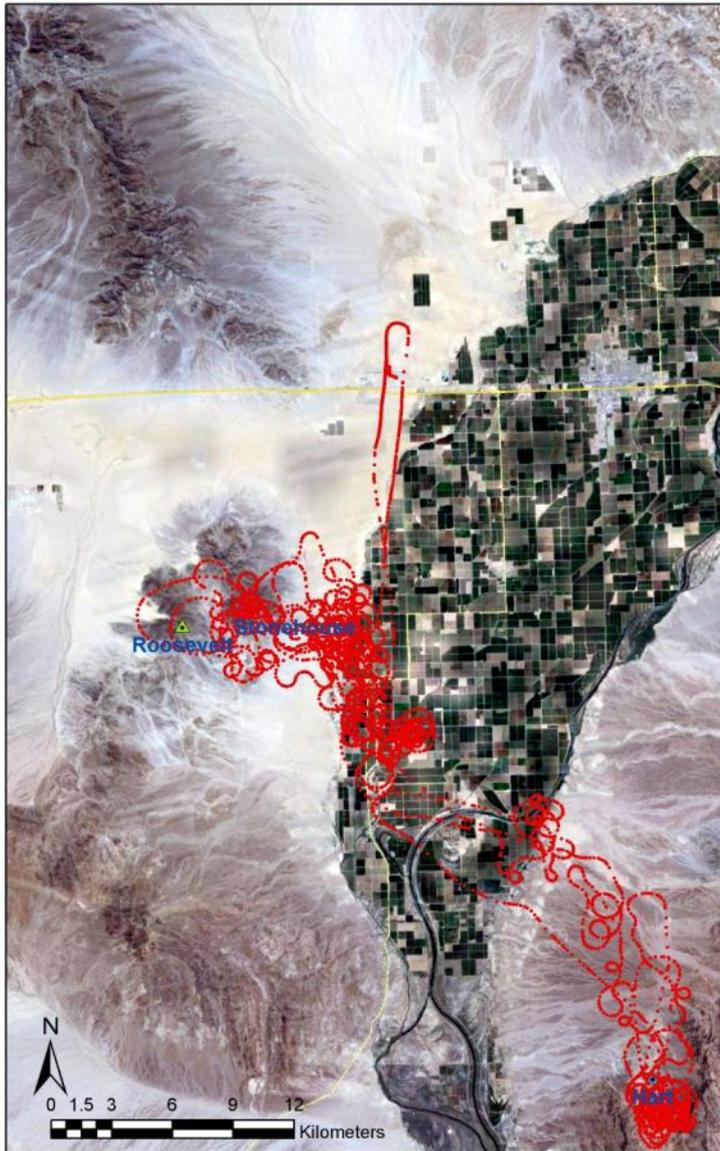
Estimated bat ranges



Aerial and ground tracking



Flight path



August 9, 2015

Estimated habitat use



Aerial and ground tracking

TELEMETRY METHODS

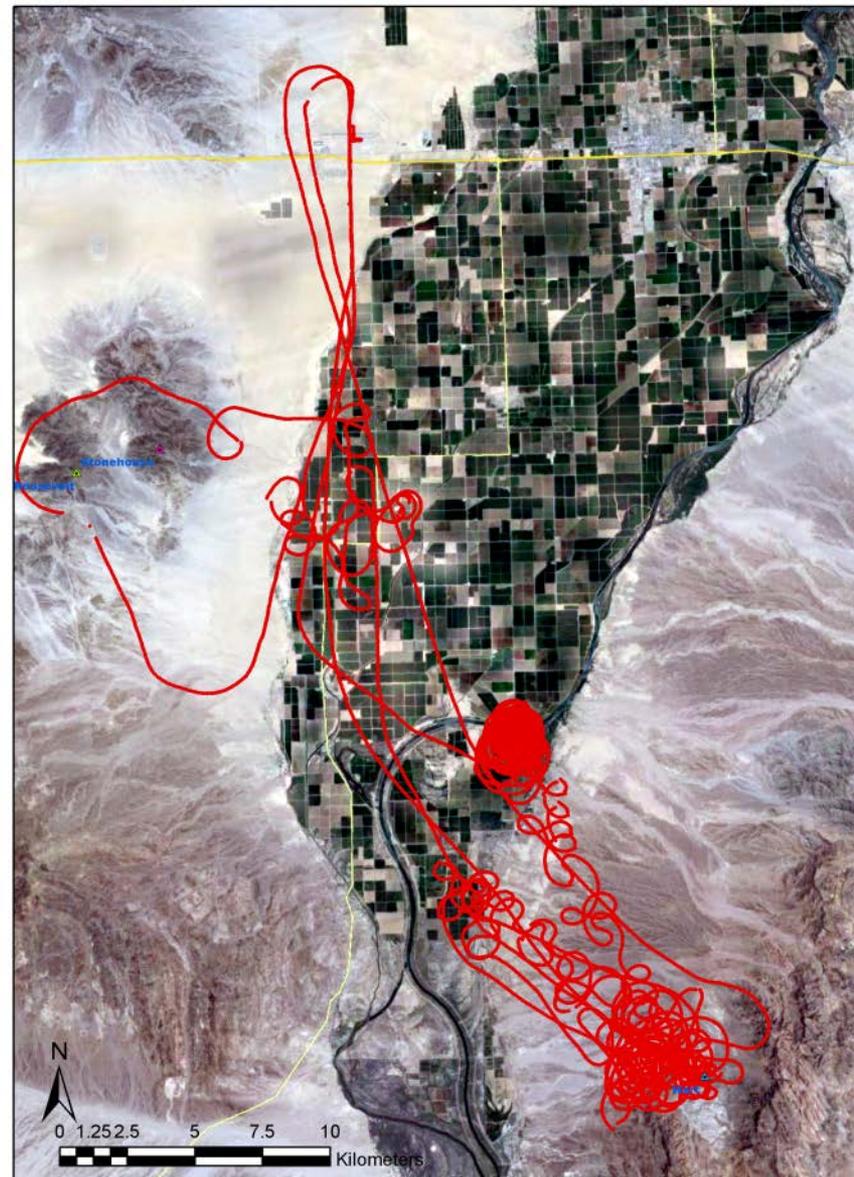
- REMOTE SCANNING AND LOGGING RECEIVERS PLACED NEAR ROOSTS & IN CONSERVATION AREAS
- DIURNAL AND NOCTURNAL RETRIEVAL OF SHED TRANSMITTERS
- NIGHT GROUND TRACKING FROM FIXED AND MOBILE STATIONS AND TRIANGULATION
- NOCTURNAL AERIAL TRACKING WITH CESSNA 172
- **BATS MIST NETTED AT CONSERVATION AREAS AND TRACKED BACK TO ROOSTS (BACK-TRACKING)**

Aerial tracking



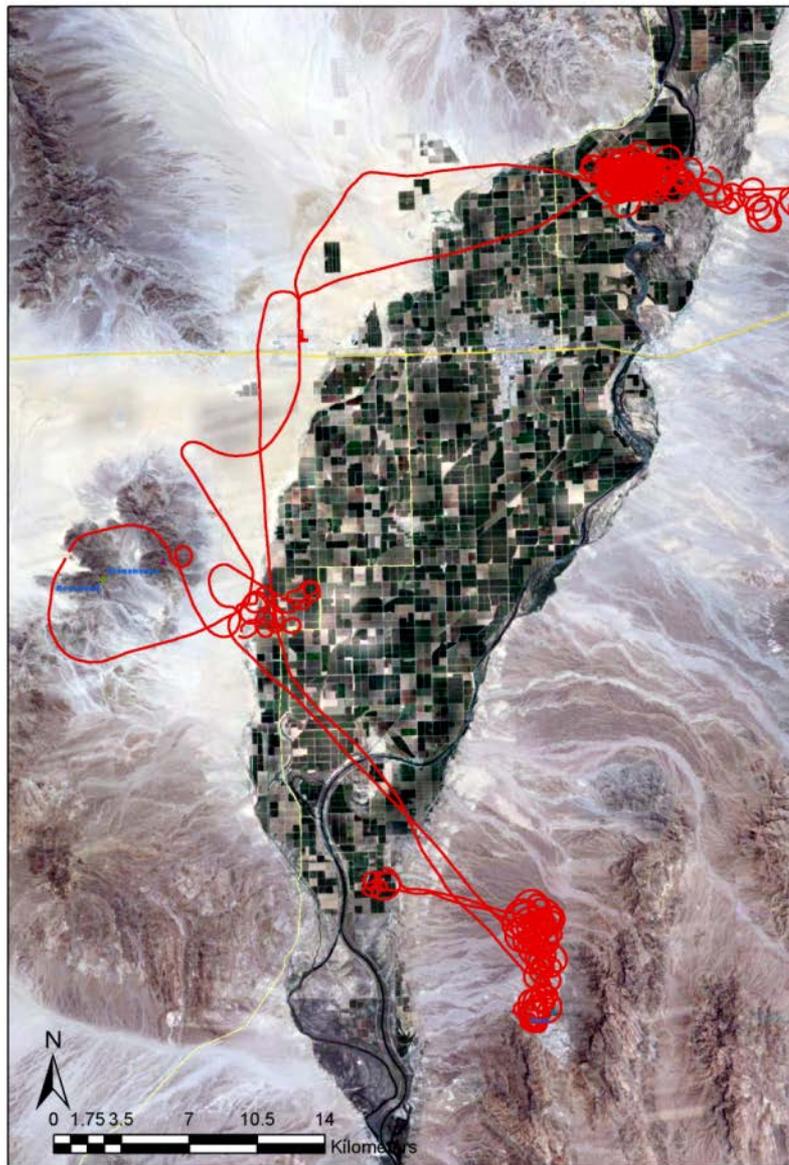
February 9, 2015

Aerial tracking



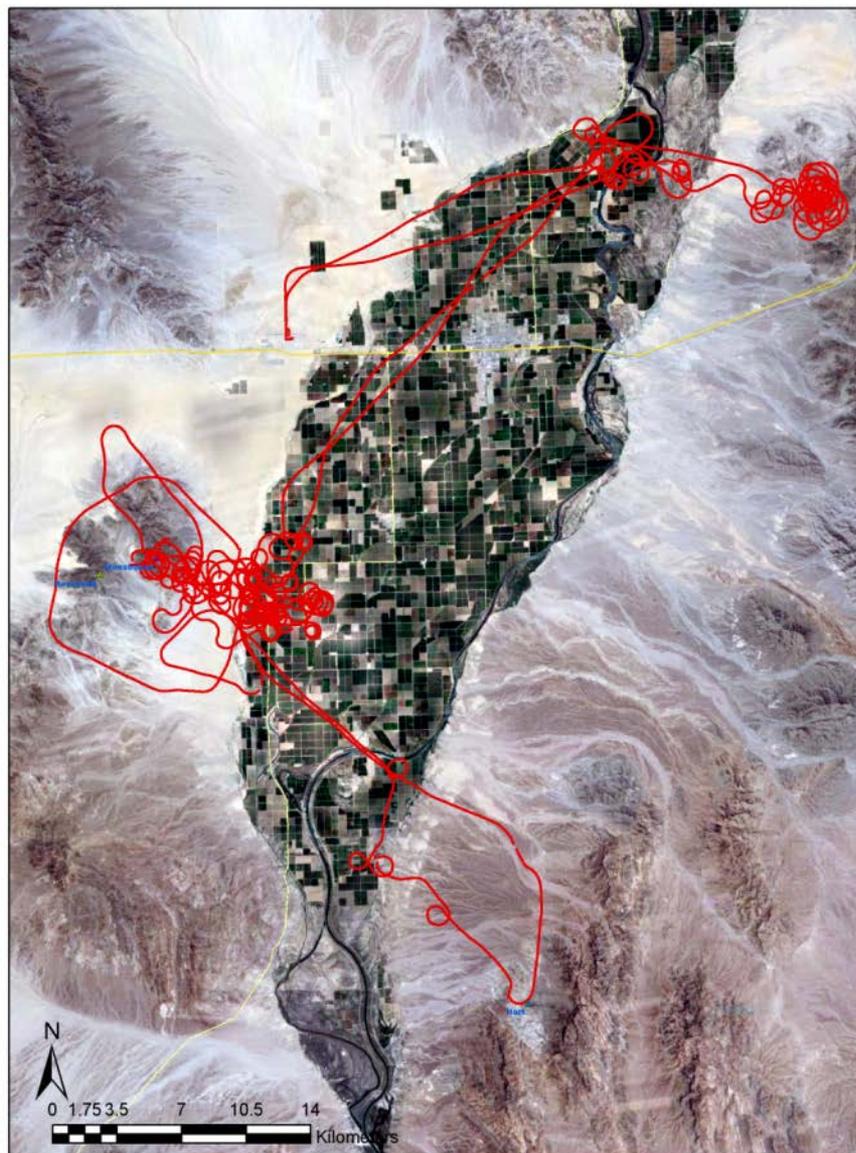
February 10, 2015

Aerial tracking

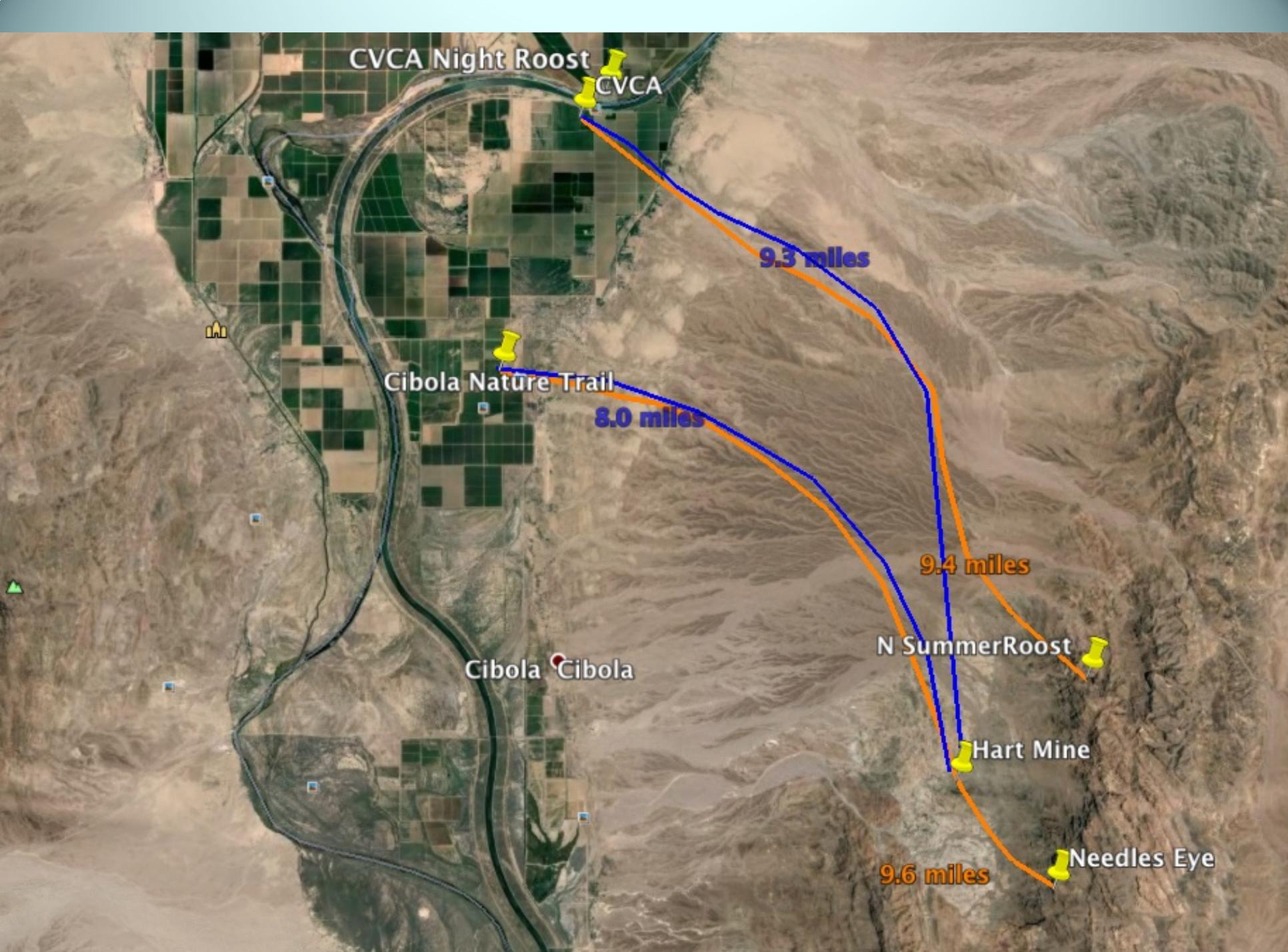


February 12, 2015

Aerial tracking



February 13, 2015



CVCA Night Roost

CVCA

9.3 miles

Cibola Nature Trail

8.0 miles

9.4 miles

N SummerRoost

Cibola Cibola

Hart Mine

9.6 miles

Needles Eye



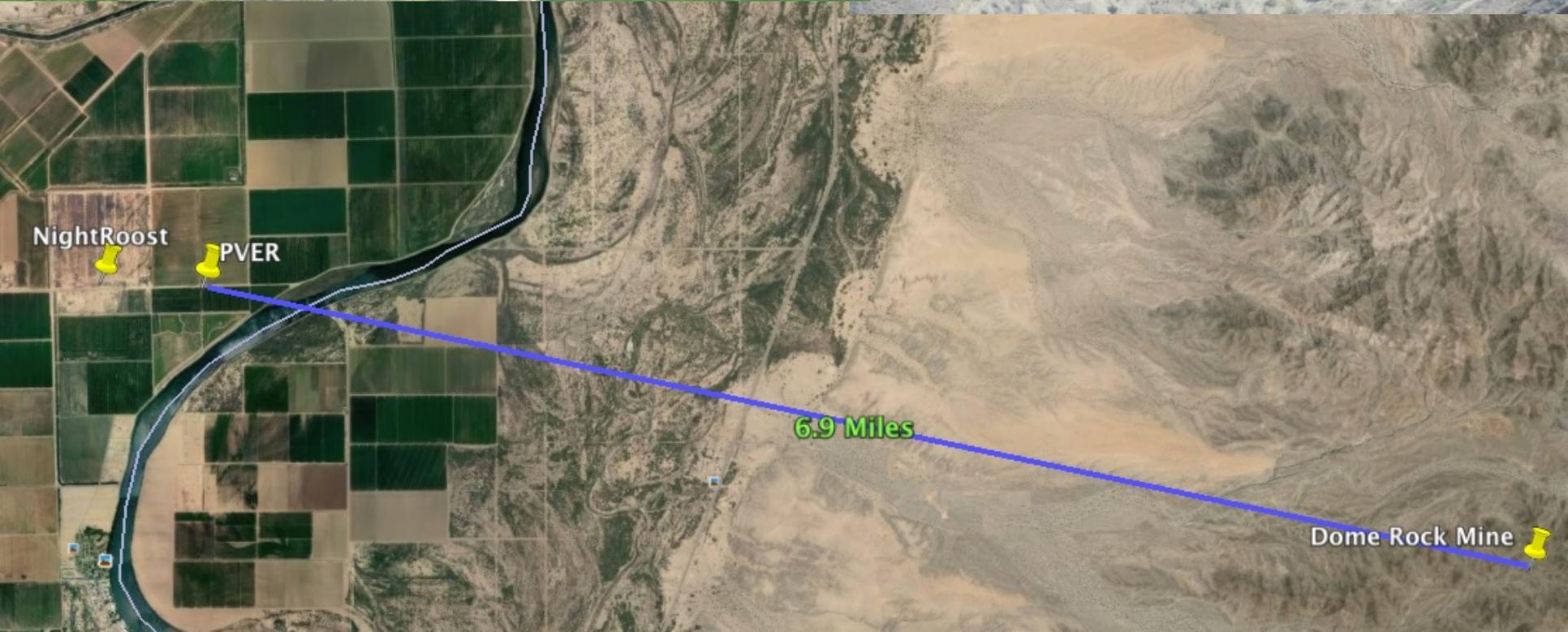
North YPG maternity



Hart Mine



Needles Eye
maternity roost



Myotis occultus were "shot over water in a back eddy of the river. Here the bats arrived in considerable numbers at early dusk to drink, flitting down to the water's surface and dipping several times before flying off among the willows and cottonwoods" (Grinnell, 1914).



Arizona myotis and Yuma myotis

2015/8/6 0.2

2015/8/6 0.19

Arizona myotis roost



Funded by Bureau of Reclamation the Lower Colorado River
Multi-Species Conservation Program

The following people provided field assistance and/or
logistical support: Allen Calvert, Carrie Ronning, Nathan
Lenon, Susan Broderick, Jeff Hill, Mary Ellen Chavez, Jenny
Smith. Jen Rottinghaus and Joe Kahl (Bureau of
Reclamation); Lin Piest (AGFD); Richard Kim and Liz
Parker(CDFW); Joe Osinski (ASU Lake Havasu); Jackie
Leivas (NAU Flagstaff); Dr. Bruce Miller, Dr. Bob Zimmerman,
Denyse Racine, Laura Stockton, Kei Yasuda, Jill Carpenter,
Kristi Holcomb, Erika Noel, Erin McConnel, Ashley Pryor, Julia
Sittig and Bea Vizcarra;
PILOT: Geoff Pope (Black Mountain Air).

And the bats who carried the transmitters

2015/ 8/11 19:38

