MONITORING COL0RADO RIVER MINE-ROOSTING BATS AND DETERMINING THEIR FORAGING RANGES

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- **Funding provided by Bureau of Reclamation LCR MSCP & Bureau of Land Management**

Mine Roost Surveys

- Two LCR MSCP covered species roost in mines along the LCR
- Bats that roost in mines can be efficiently counted
- The number of bats in a roost is determined by the carrying capacity of the foraging habitat within commuting distance.
- Monitoring these colonies provides an indicator of foraging habitat quality over time
- Monitoring the mines can also identify potential threats to these roosts and assist in the protection of the species

California Leaf-nosed Bat

Townsend’s Big-eared Bat

Townsend’s Big-eared Bat

Alice Mine, Riverside Mountains

Historically large colonies in abandoned mines along the Colorado River

Foraged in cottonwood willow riparian

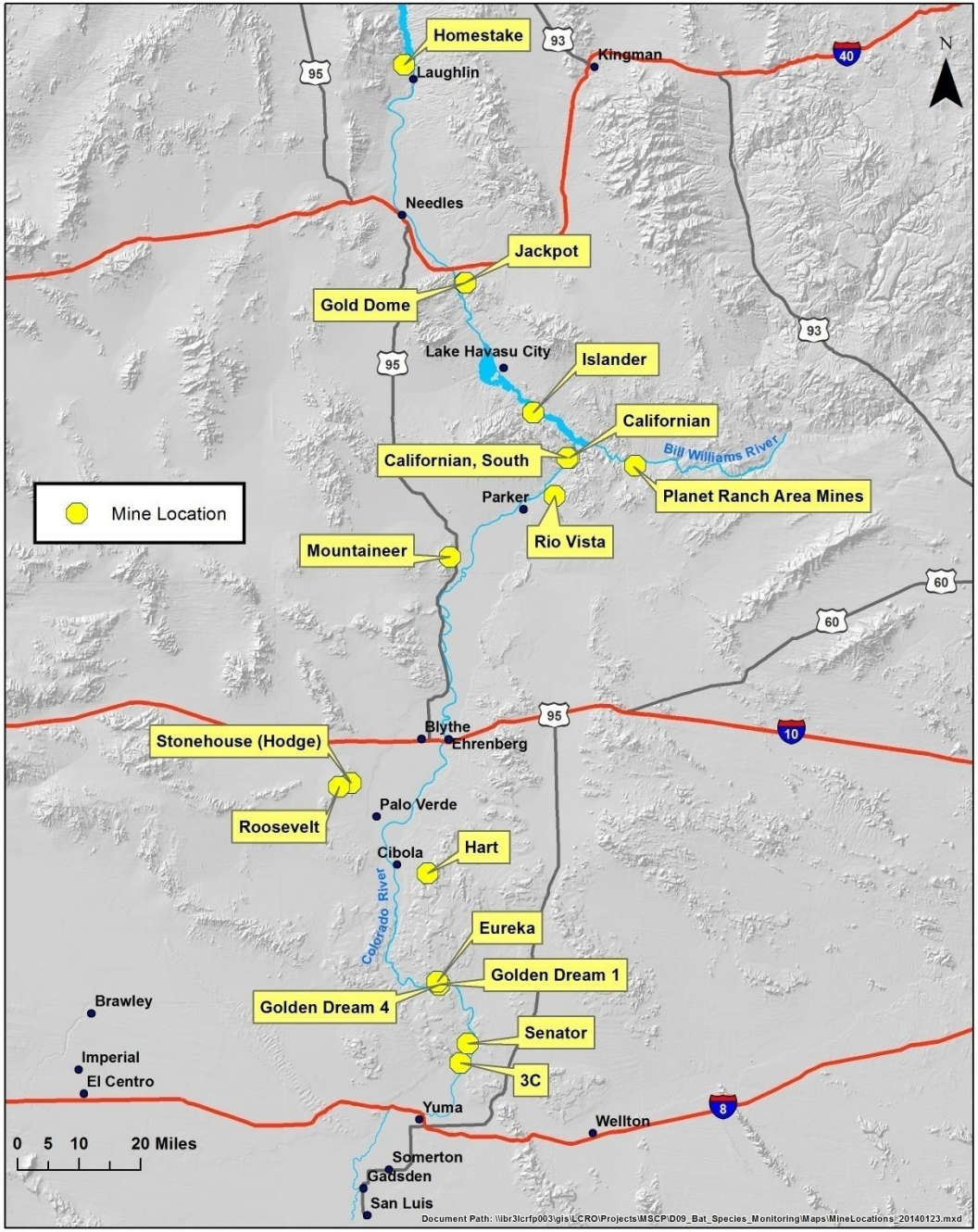
Marked declines attributable to loss of cottonwood riparian and roost disturbance

Known *Macrotus* Roosts

Mine Selection Criteria

- Historic roosts
- LCR MSCP Species
- Maternity colonies
- Large colonies
- Accessible
- Protected by gates or location
- Different areas along the LCR

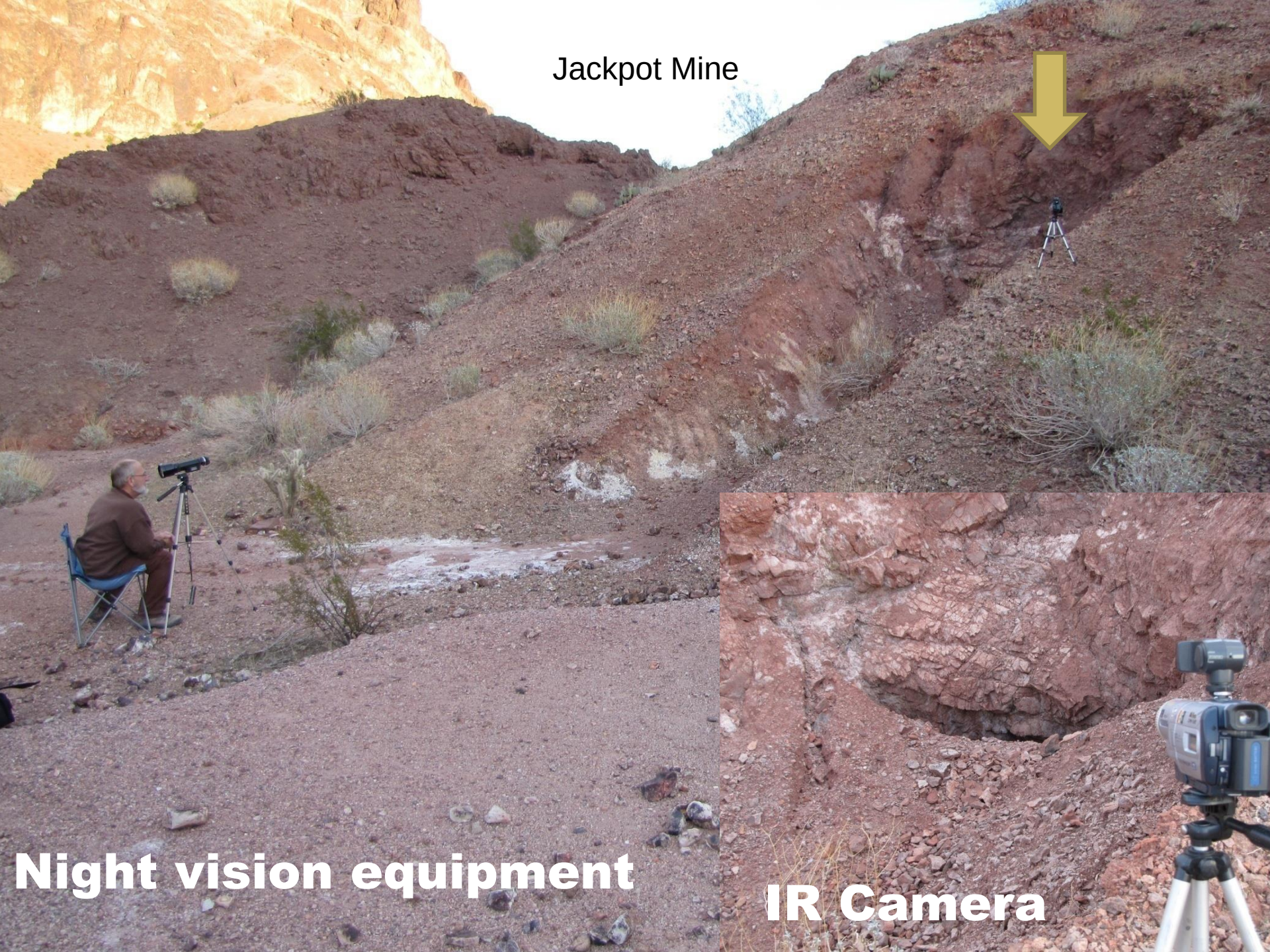
Mine Locations Along the Lower Colorado River



Mine Site	Winter	Spring	Surveyed	# openings	Ownership
3C	Maca	Maca male, Myyu maternity	W,S	1	BLM
Californian	Maca	Maca male, Myve maternity	W,S	1	BLM
Californian, South	Maca	Maca maternity, Myve and Myyu	W,S	2	BLM
Eureka	Maca	Maca and Myyu maternity	S	7	USFWS
Gold Dome	Maca	male Maca, Myyu, Myve	S	1	USFWS
Golden Dream 1		Myyu maternity	S	1	USFWS
Golden Dream 4	Maca	Maca maternity	S	1	USFWS
Hart	Maca	Maca male	W,S	1	BLM
Homestake	Maca	Maca maternity, Myyu & Myve male	W,S	3	NPS
Islander	Maca. Tabr lek	Maca and Myyu maternity	S	4	BLM
Jackpot 1	Maca	Maca male, Myve maternity	W,S	1	USFWS
Mountaineer	Maca	Maca, Coto, Anpa, Myve & Epfu maternity	W,S	2 in winter, 4 in summer	BLM
Stonehouse (Hodge)	Maca	Maca and Myve maternity	W,S	5	BLM

Pat in Californian Mine 1975

Macrotus released

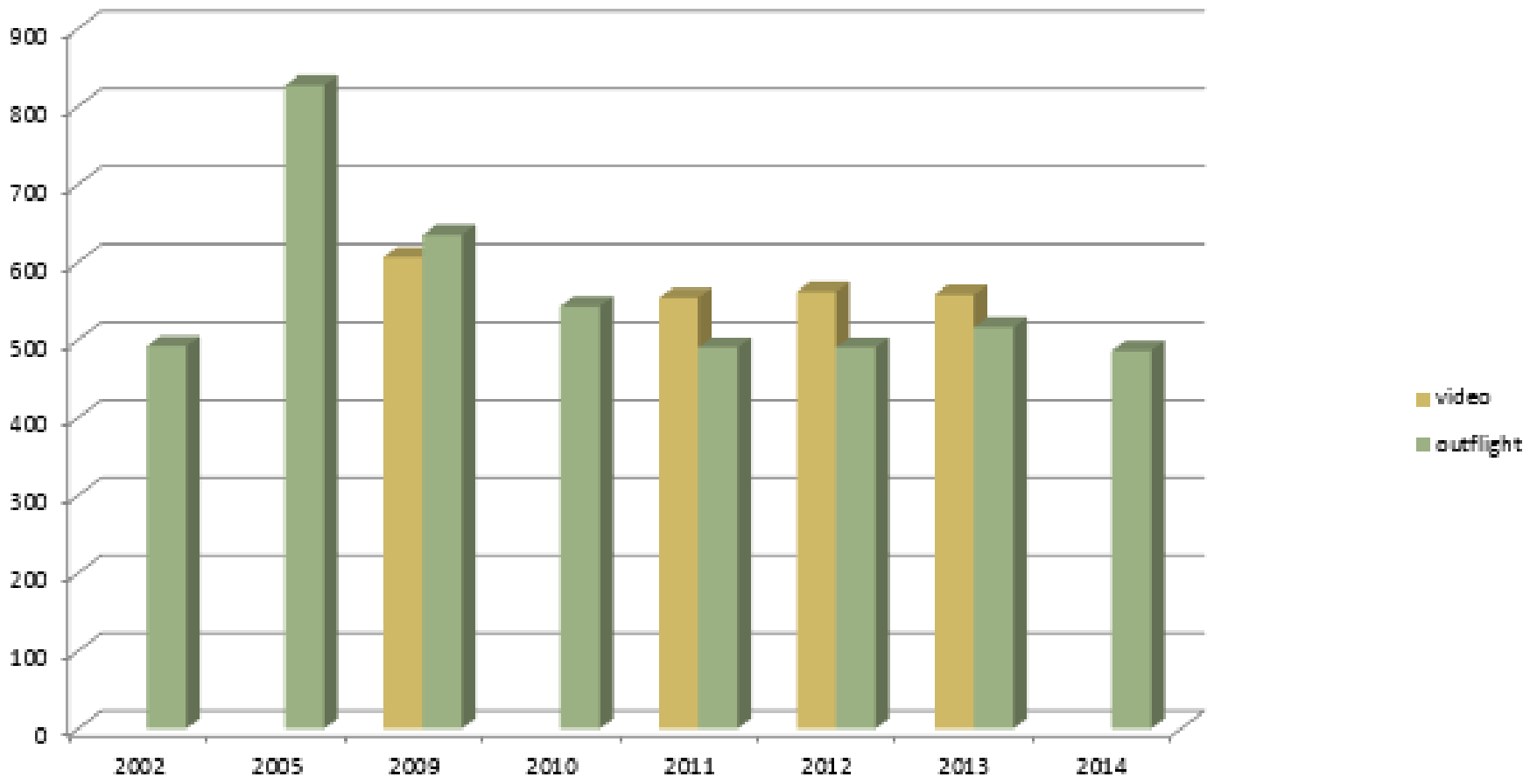

Jackpot Mine
Night vision equipment
IR Camera

Moon Phase Effect

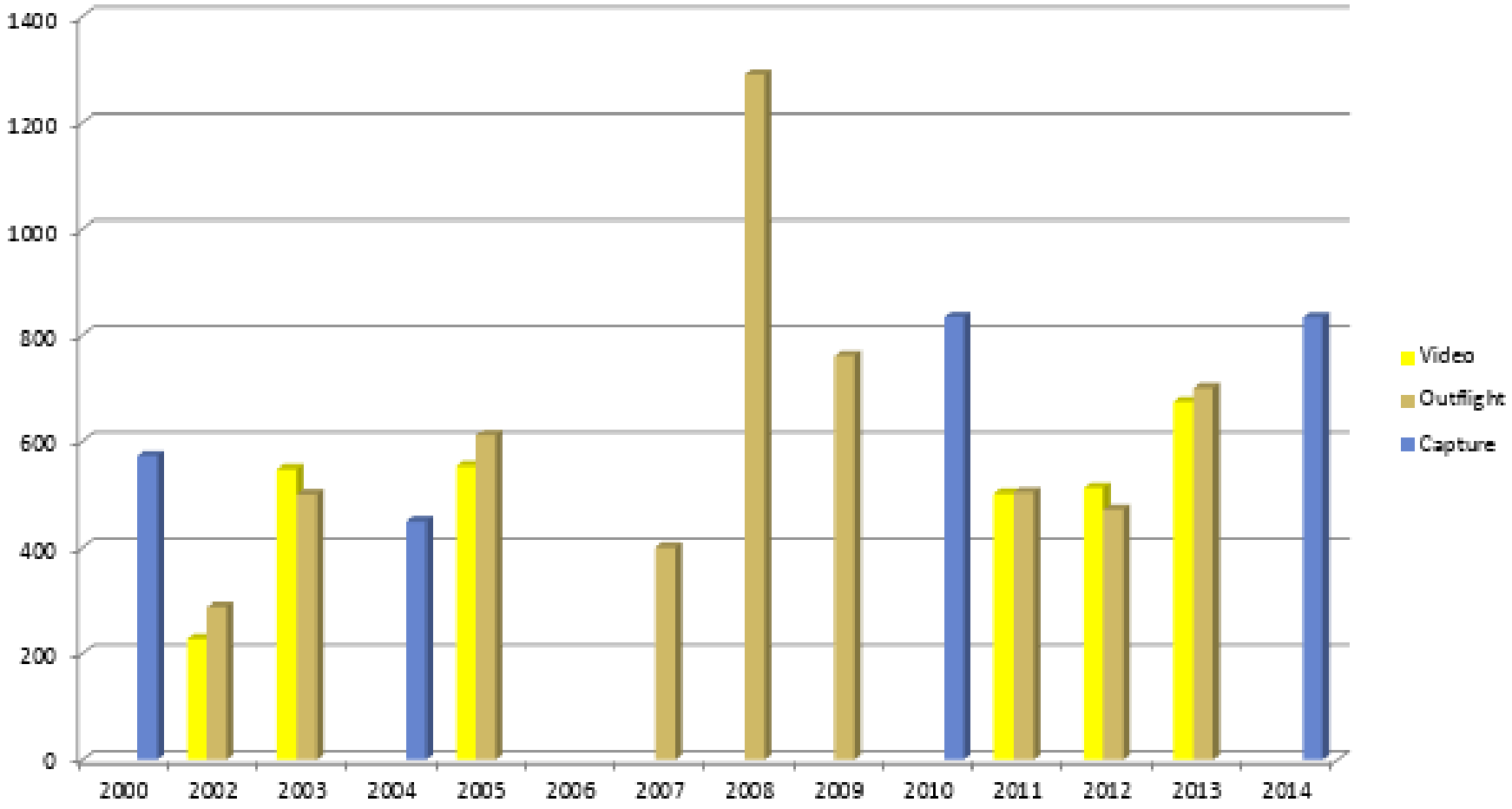
January 2003

Mine	Macrotus Exit Count	
	Moon	No
3 C	1515	2491
Queen	26	144
American Boy	12	172

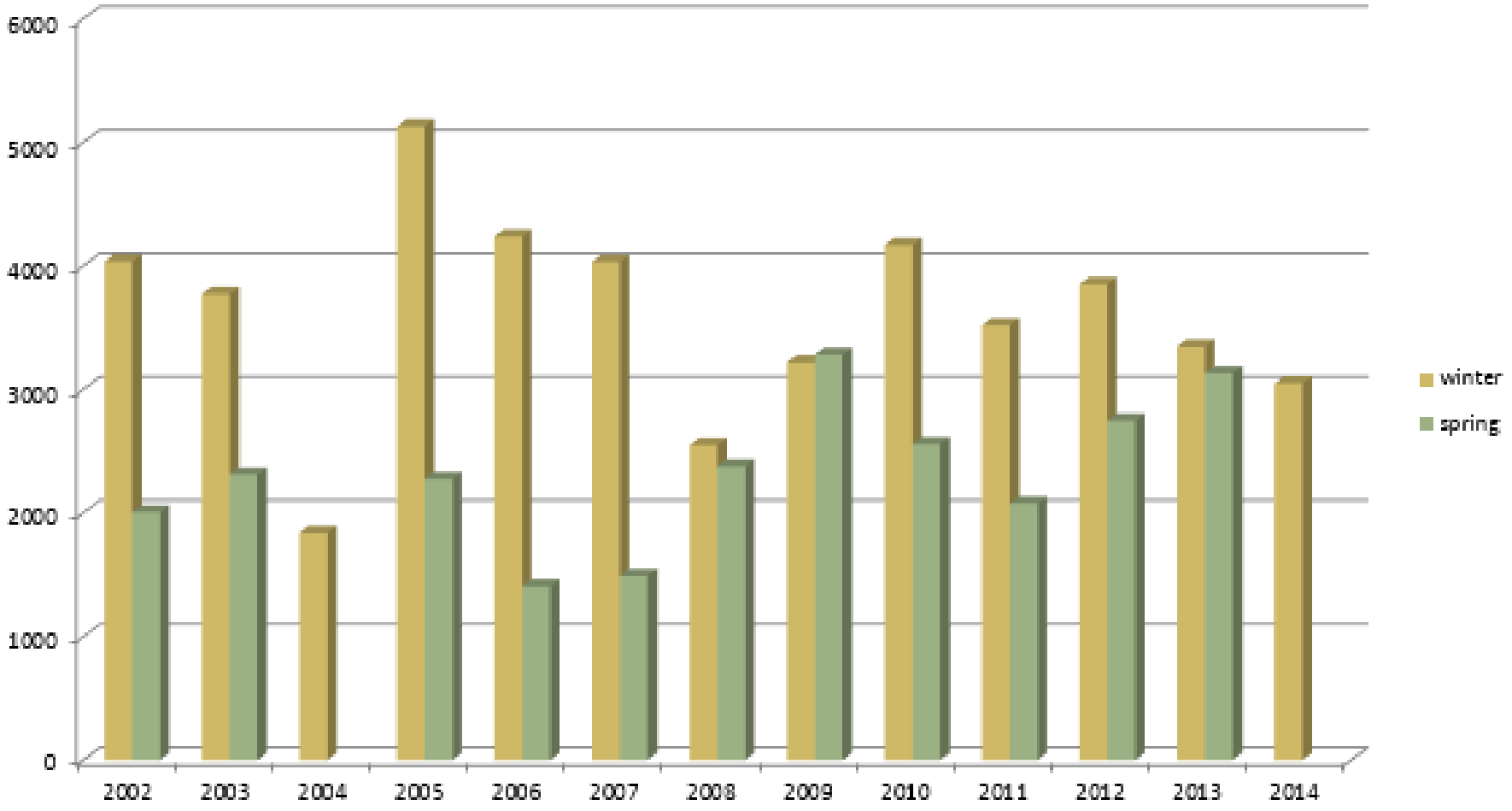
Jackpot Mine Winter Counts



Californian Mine winter exit counts



Stonehouse Mine complex winter and spring exit counts



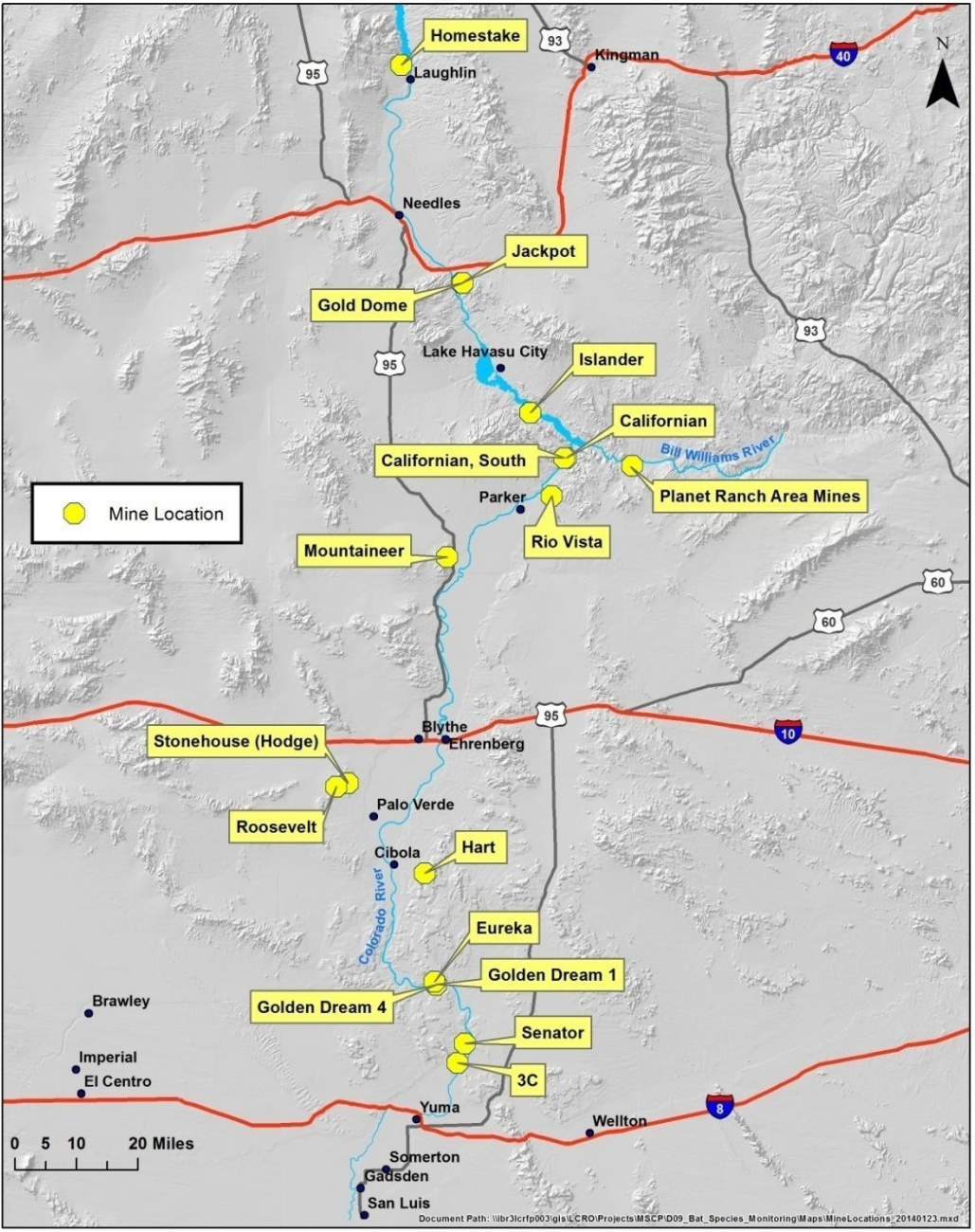
Foraging Distance Surveys

- Mist netting in MSCP Restoration areas capture CA leaf-nosed bats
- Some Restoration 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 Restoration areas

California leaf-nosed bat foraging habitat

Chewed Tree Lizard
23 4:02PM

Mine Locations Along the Lower Colorado River

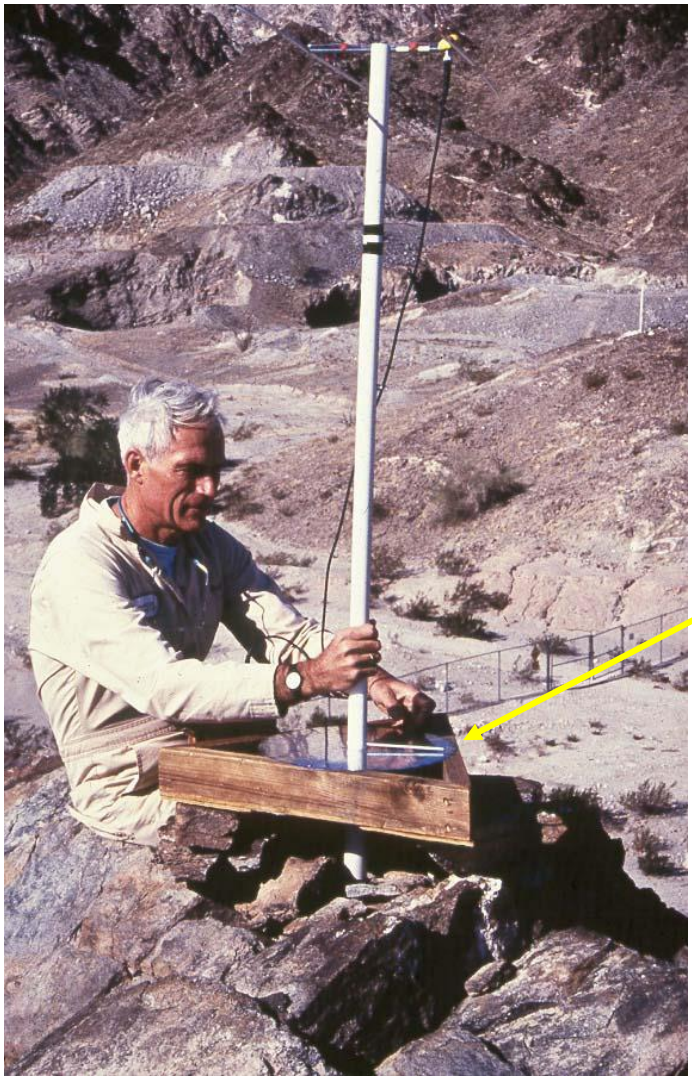


Distances between Restoration Areas and Mines

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

Macrotus californicus Winter Mine Roosts

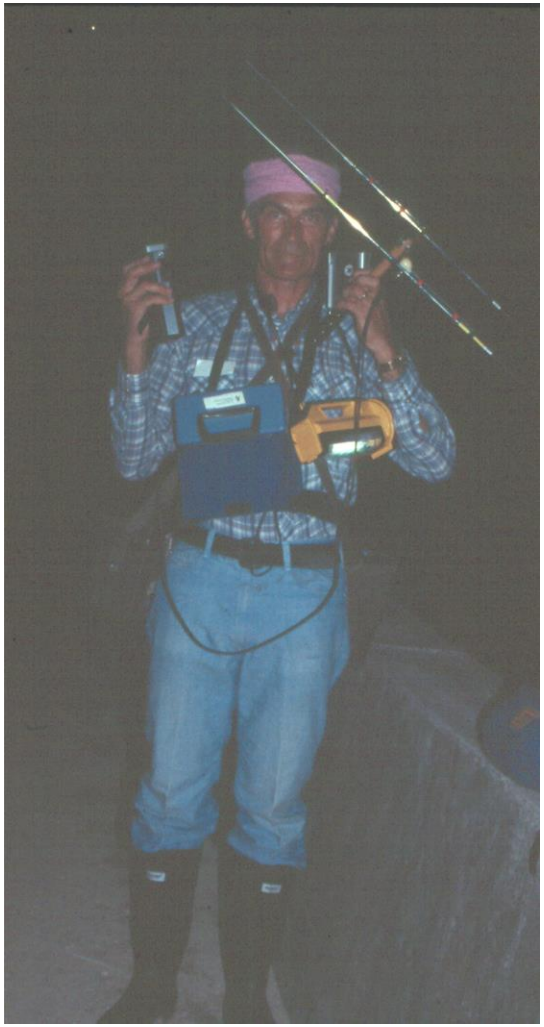
Fixed Station Monitoring



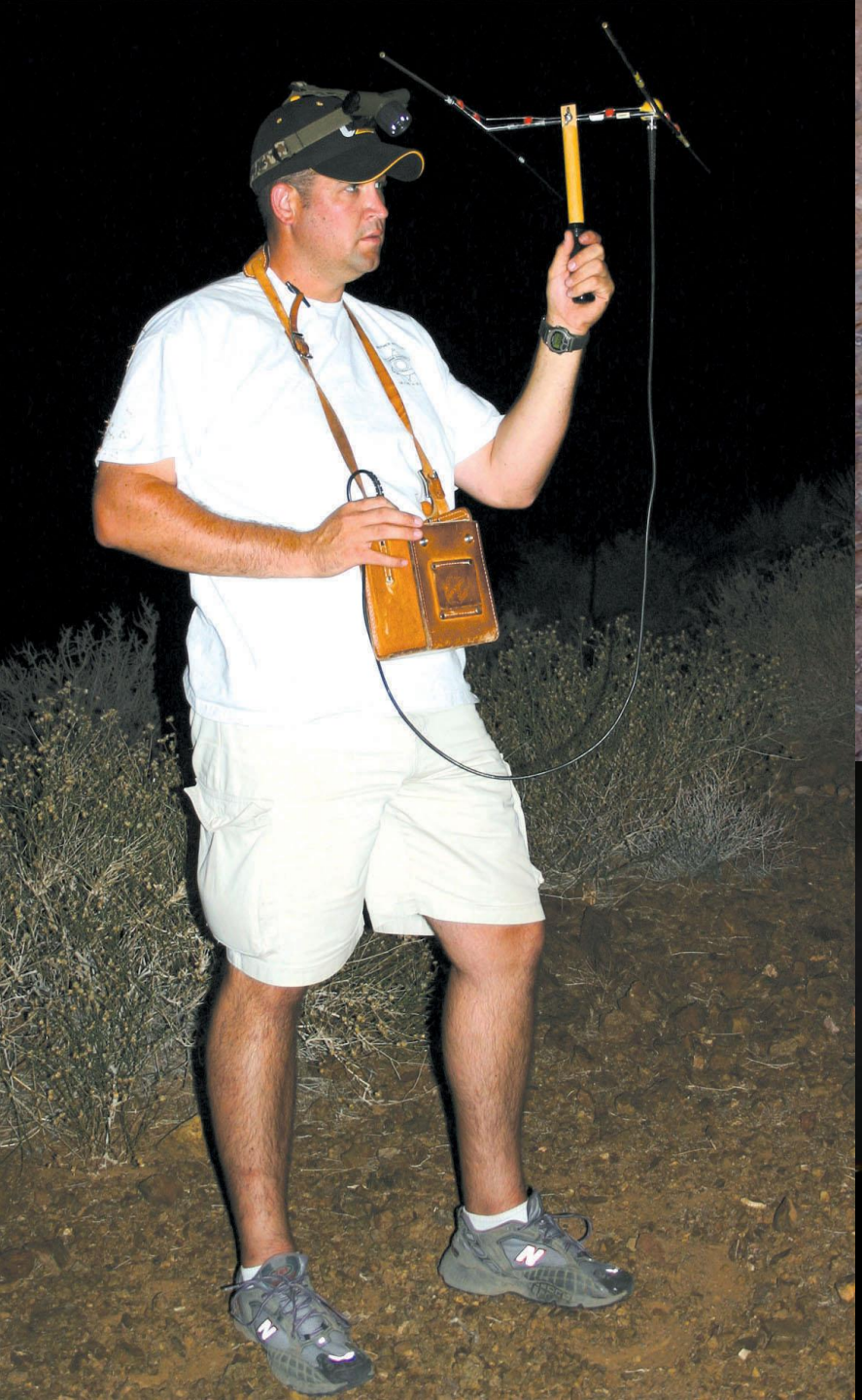
Trained operator
Telemetry receiver with directional antenna
Radio communications
Accurate time piece
Magnetic compass or Compass rose aligned to the north star to remove compass error and to facilitate rapid reading
Warm clothes, flashlight, water and snacks to last the night

Mobile Monitoring

Trained operator
Telemetry receiver with directional antenna
Radio communications
Accurate time piece
Magnetic compass
GPS for locating receiver position
Hiking boots
Warm clothes, flashlight, water and snacks to last the night



Ground Trackers



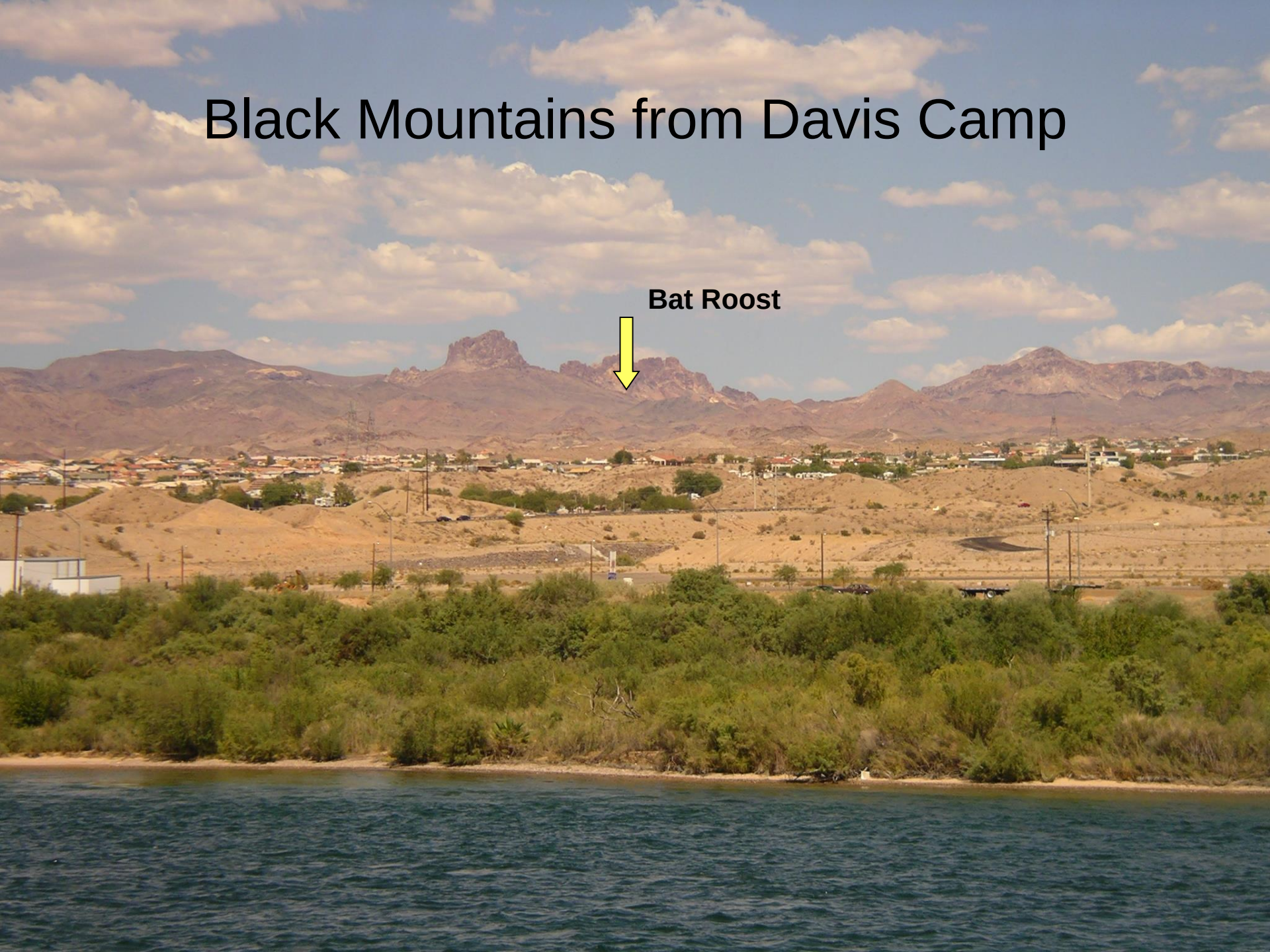
Super Mobile Monitoring

Cessna 172 outfitted with two strut mounted Telonix directional antennas with highest gain perpendicular to flight path

Earthwatch
Blue Logger
GPS
N1218Q

California
Bat Conservation
Bat

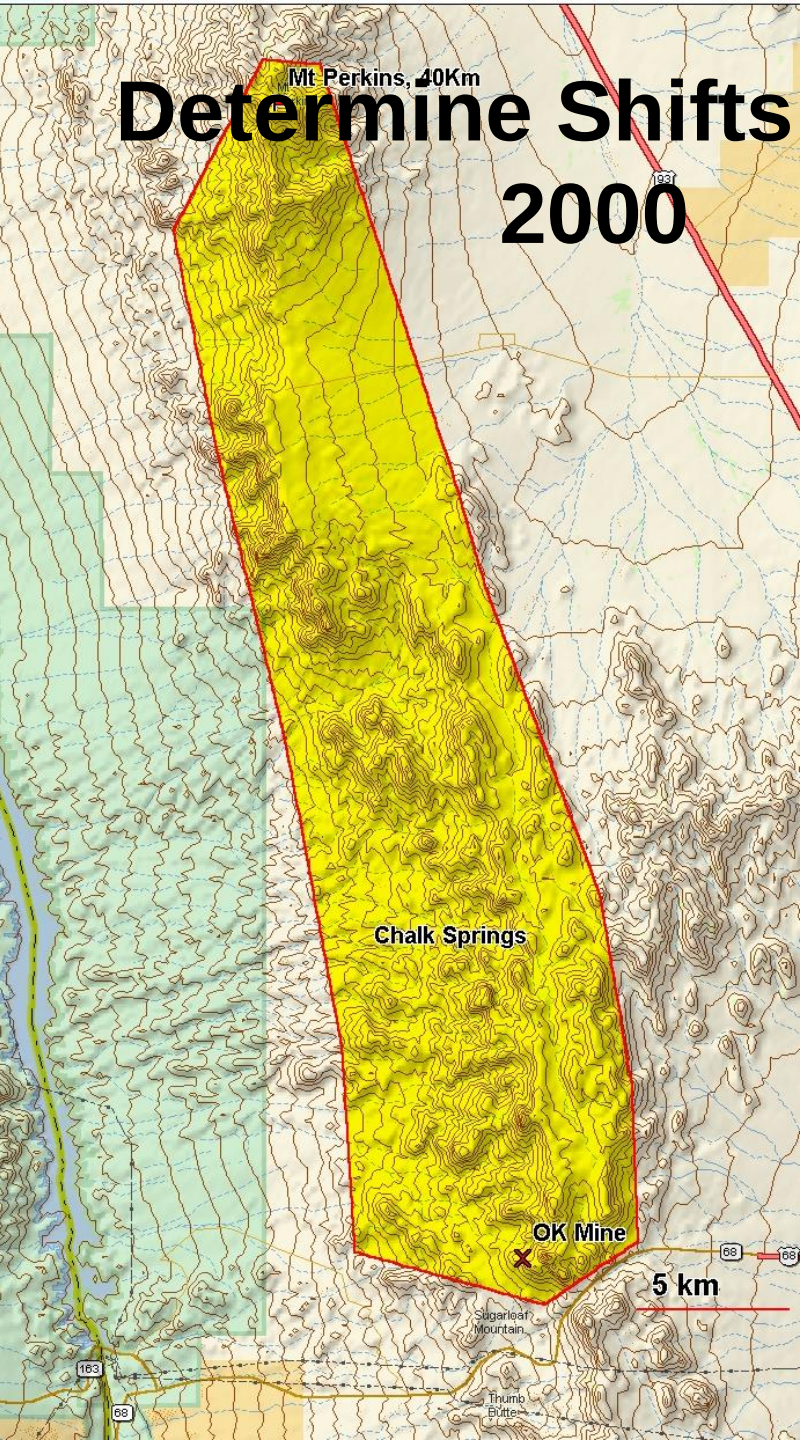
Black Mountains from Davis Camp



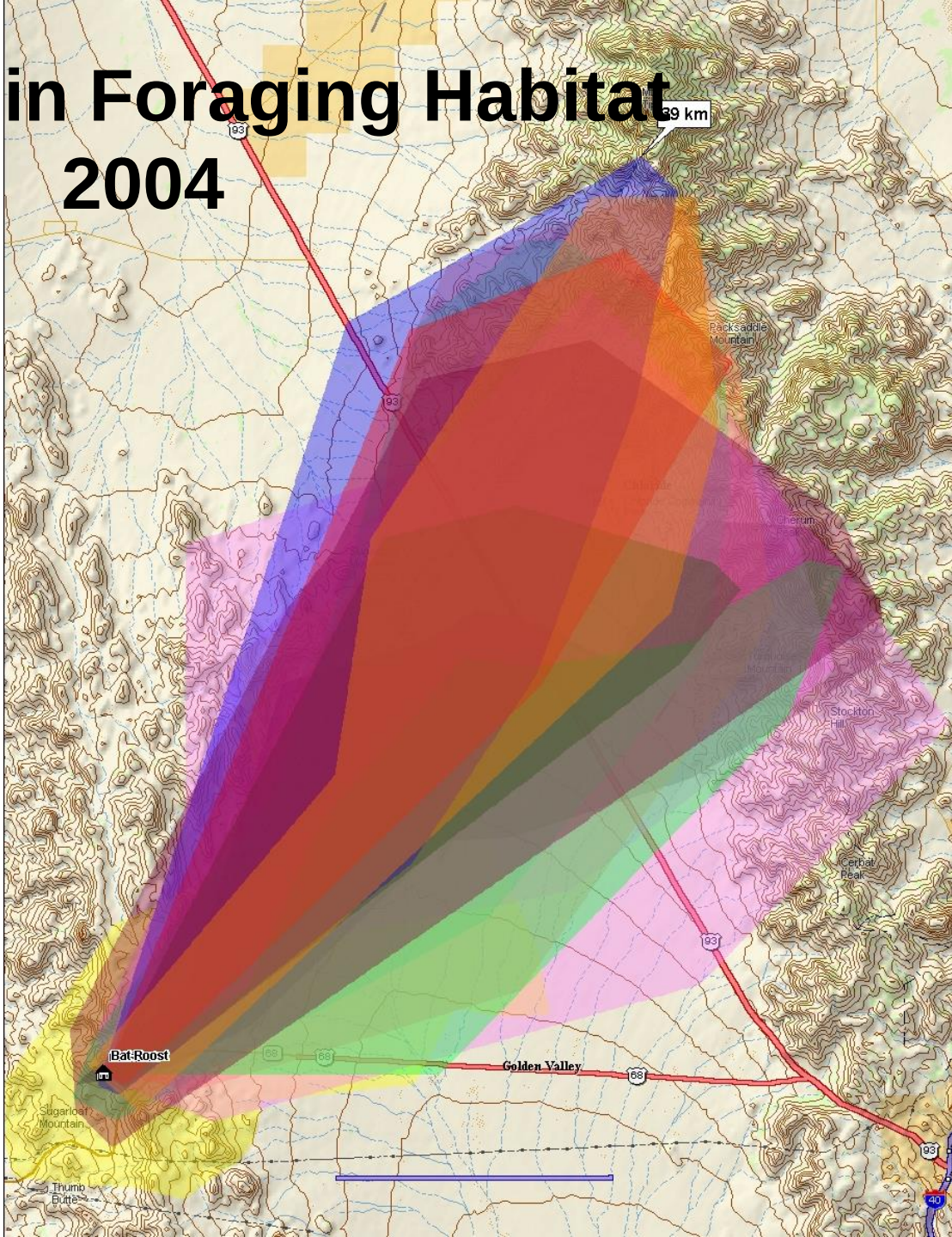
Allen’s lappet-browed bat

Determine Shifts in Foraging Habitat

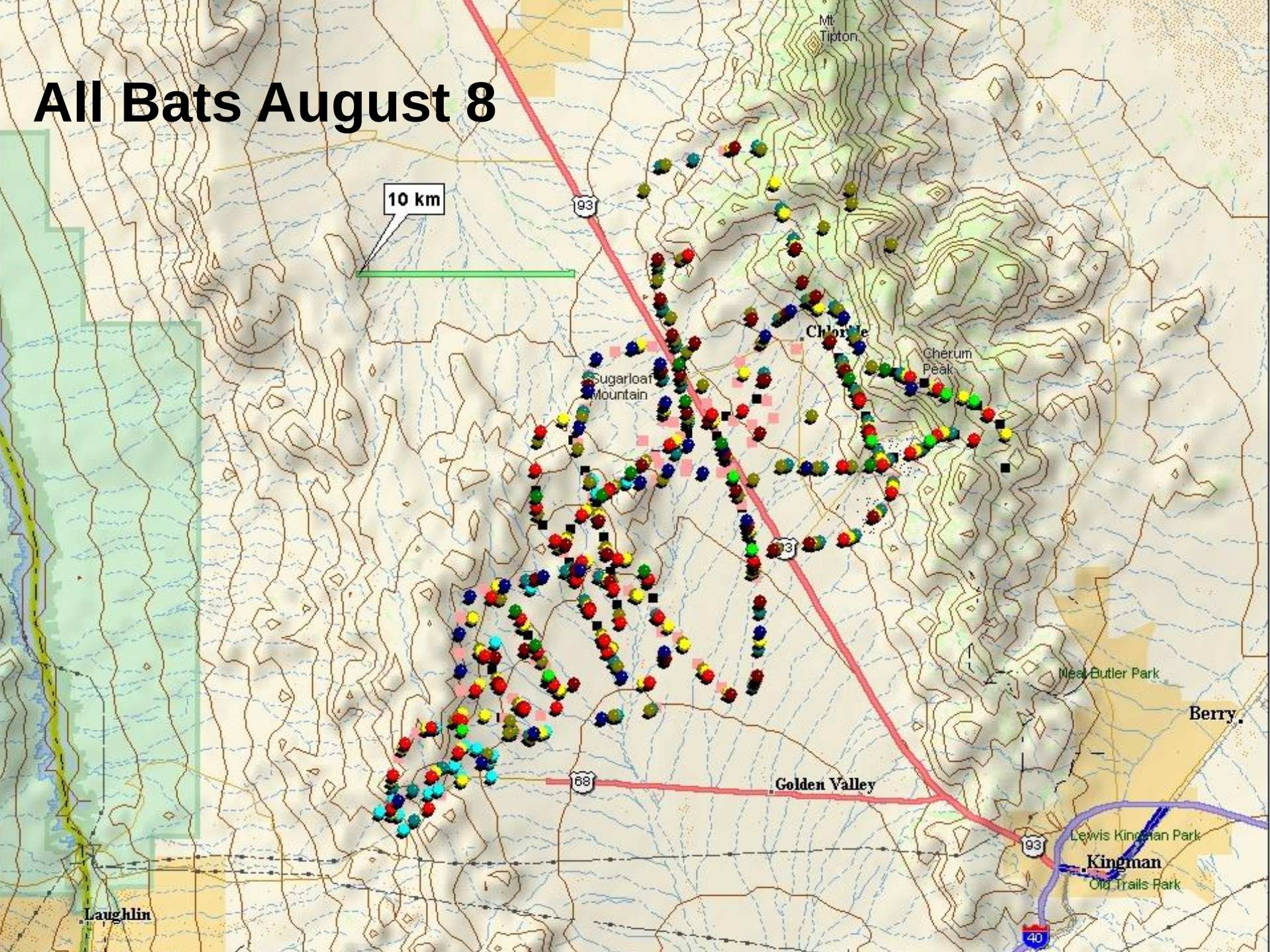
2000



2004



All Bats August 8



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MN (12.8° E)

0 200 400 600 800 1000 m

Data Zoom 13-0

Bat 5 Transmitter Recovery Site

Management Implications

- **Foraging areas for Allen's lappet-browed bats may be > 40 km from the roost**
- **Foraging areas may change between seasons and years**
- **Radio telemetry is the only means to determine foraging range of individual animals**
- **Knowledge of both roosting and foraging habitat is important for species management**

ACKNOWLEDGMENTS

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Homestake Mine
January 29, 2014