Population Status and Reproductive Ecology of the Western Burrowing Owl (*Athene cunicularia hypugaea*) in Clark County, Nevada

Dorothy Crowe and Kathleen Longshore

US Geological Survey
US Department of Interior

Introduction to Burrowing Owls

- Small owl (150 g)
- Roost & nest in burrows excavated by other fossorial species
- Inhabits grasslands, shrub-steppe and deserts
- Flat to gently rolling terrain
- Have adapted to agricultural and urban environments

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Western Burrowing Owl Status

- Population declines throughout range
- Endangered in Canada
- Species of special concern in many western and midwestern states of the U.S.
- National priority species by the USFWS

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Previous Studies

Little knowledge about owl populations in the Mojave Desert

- 2002 Initiated roadside, call-broadcast surveys; 49% crepuscular & 51% nocturnal at Lake Mead NRA
- 2003 Tested factors affecting detection; expanded area surveyed; initiated nocturnal walking surveys & availability estimates at Lake Mead NRA
- 2004-2005 Added perception estimates, added additional field site (MCAGCC Twentynine Palms)

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Desert Tortoise Burrow

Gopherus agassizii

Kit Fox Burrow Complex

Vulpes macrotis

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What did we learn?

- Survey protocol (what works in Mojave Desert)
- Density (first estimates for Mojave Desert)

  0.08-0.17 owl territories/km^2
- Reproductive success

  Apparent nest success: 55-69%
- Landscape variables associated with owl occurrence (MCAGCC)

  Lower % slope & greater desert tortoise density
- Habitat variables associated with [1]nest site selection & [2]apparent nest success (Lake Mead NRA)

  [1] Larger size of mound at entrance to burrow

  [1]Type of burrow (desert tortoise)

  [1,2]Greater number of satellite burrows within 5 m

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Status in Clark County?

Project

Goals and Objectives

- Determine distribution and relative abundance of Burrowing Owls in Clark County
- Model Burrowing Owl habitat for Clark County
- Determine the relationship between Burrowing Owl reproductive success and habitat/environmental variables

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Survey Protocol for the Mojave Desert

- Random, nocturnal, walking, call-broadcast transect surveys
- 3.2-km transect with 5 broadcasting stations spaced 800 m apart
- Six-minute point count session per station including a 3-min passive listening interval and a 3-min broadcast interval
- Broadcast interval included 3 repeats of 30 sec of owl vocalizations followed by 30 sec of listening
- Seasonal timing from late February through mid-May

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Detection Probability

- Detection probability: proportion of owls detected compared to true owl occurrence
- Two components: availability and perception
- Availability: detection trials or proportion of owl responses to call-broadcast protocol at known owl territories
- Perception: double-observer method

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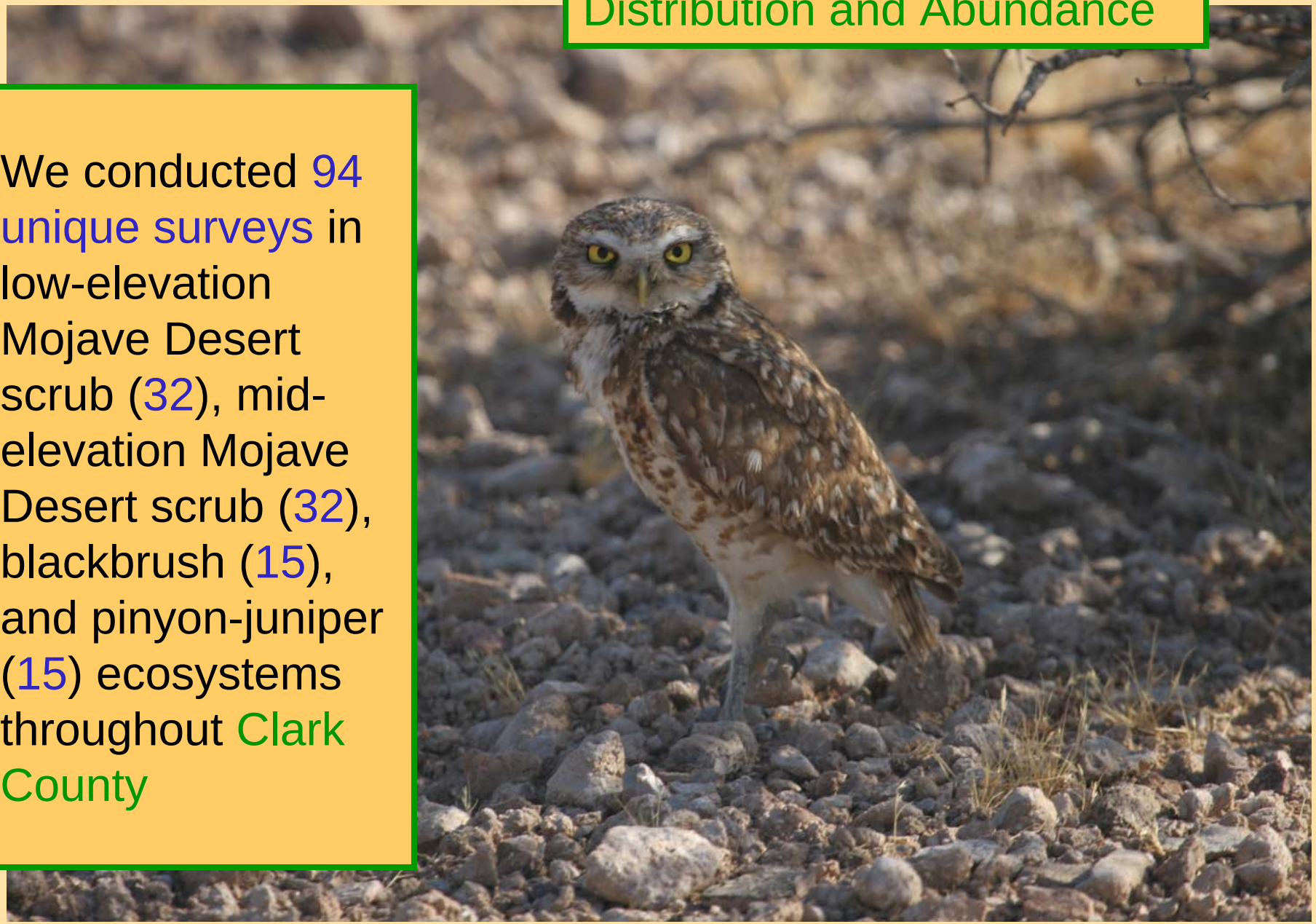
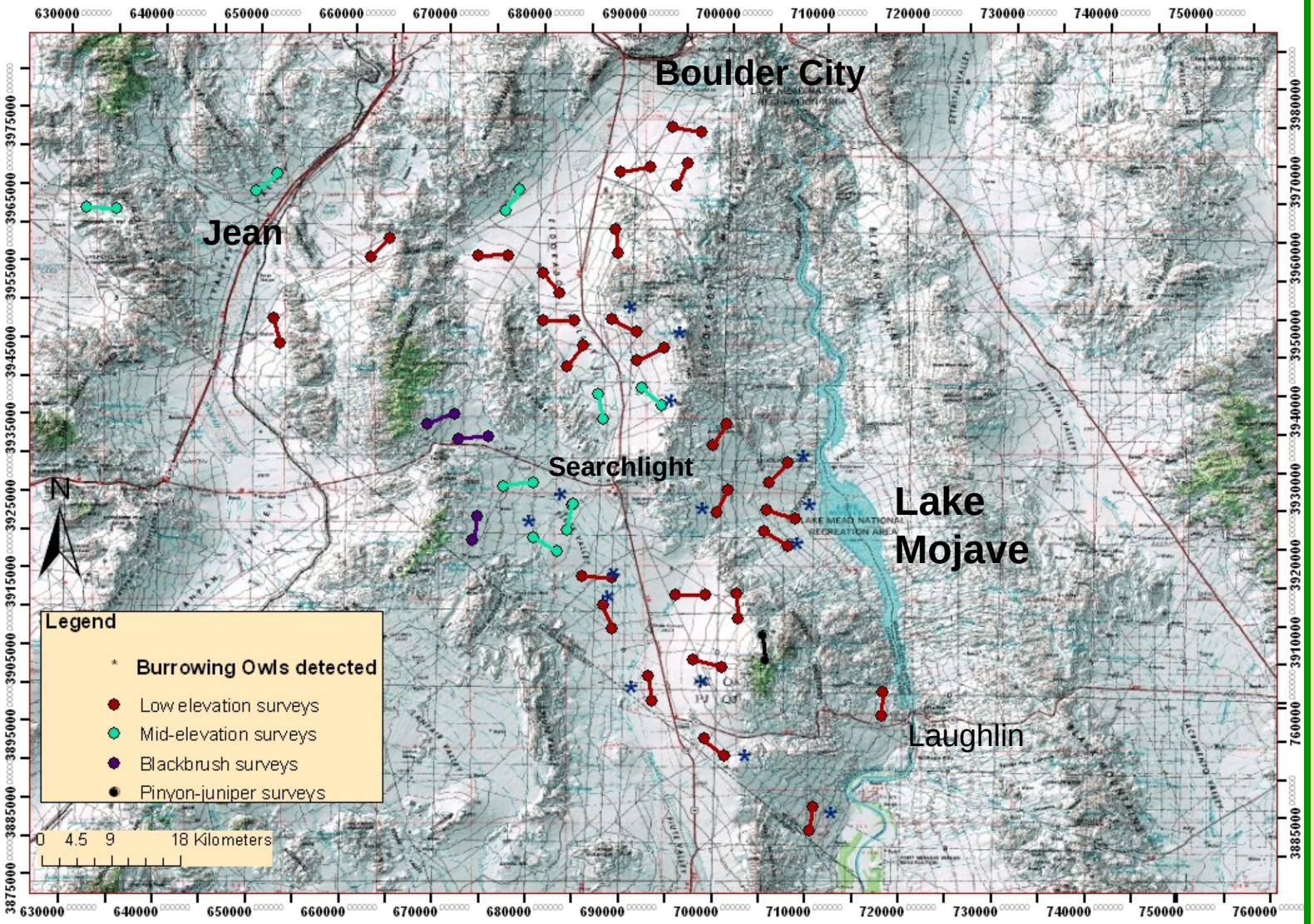
Distribution and Abundance



We conducted 94 unique surveys in low-elevation Mojave Desert scrub (32), mid-elevation Mojave Desert scrub (32), blackbrush (15), and pinyon-juniper (15) ecosystems throughout Clark County

Owl surveys conducted in southern Clark County



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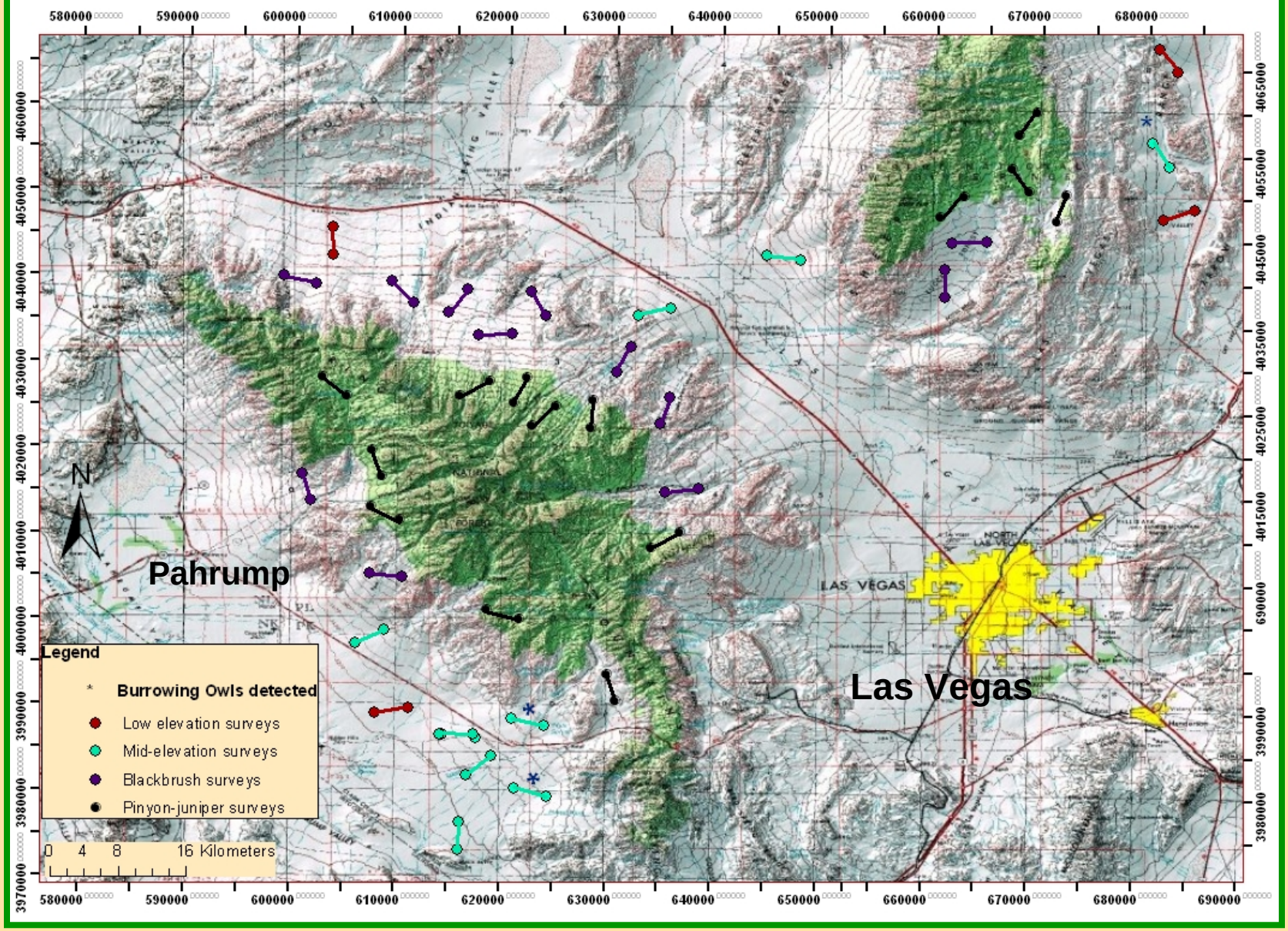
Owl surveys conducted in northwest Clark County



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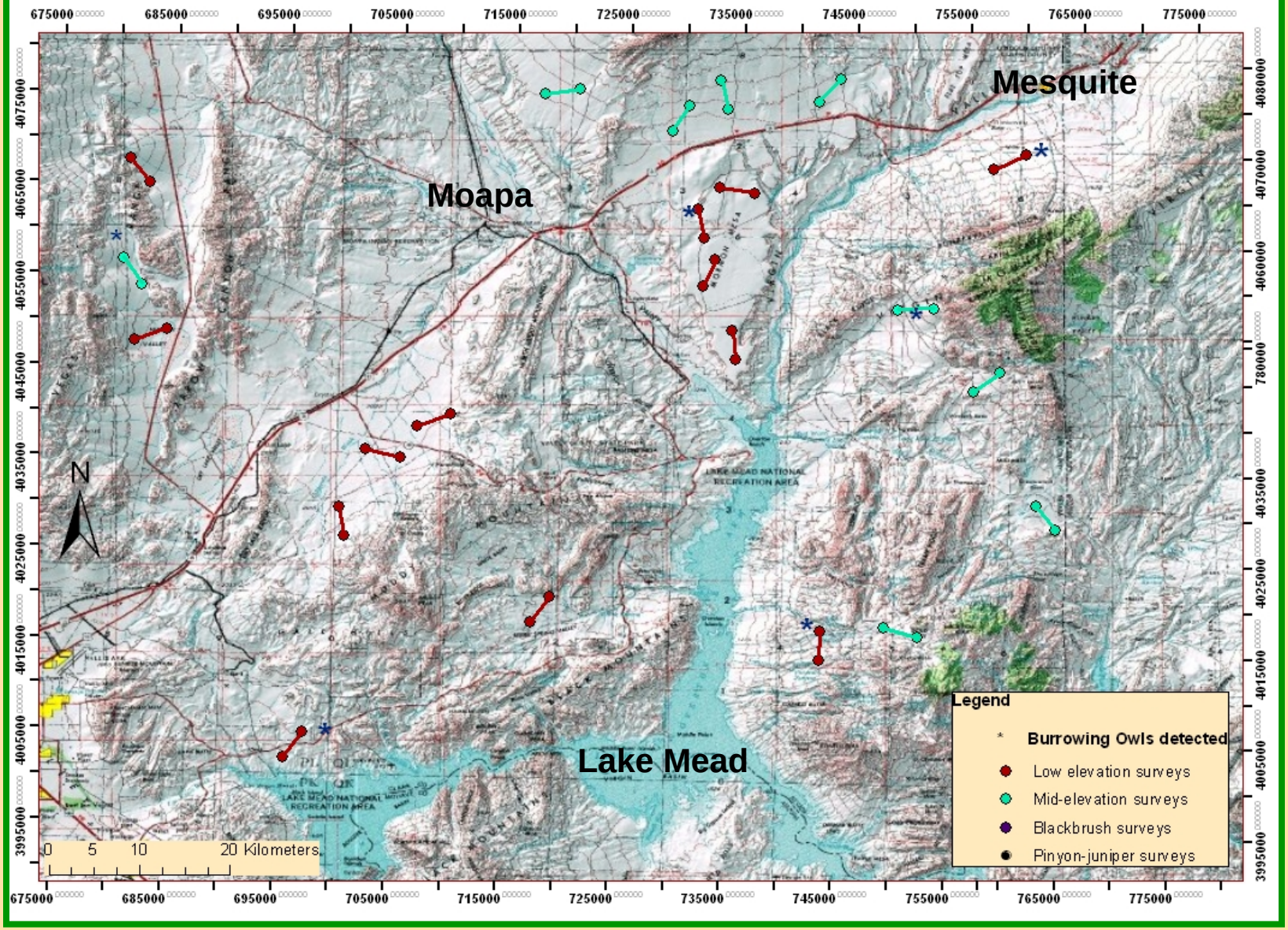
Owl surveys conducted in northeast Clark County



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Survey Results

Year / Habitat	Abundance Variables	2008 surveys	2009 (repeated 2008 surveys)	2009 New surveys
Low-elevation Mojave Scrub	Frequency of occurrence	27% *N*=15	21% *N*=14	18% *N*=17
	Owl Count	11	6	4
Mid-elevation Mojave Scrub	Frequency of occurrence	20% *N*=15	40% *N*=15	29% *N*=17
	Owl Count	8	8	6

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Modeling Burrowing Owl Habitat

- **Habitat characteristics associated with Burrowing Owls**
  - Flat to gently rolling terrain
  - Sparse vegetation
  - Availability of burrows
- **Landscape-level approach using GIS layers – elevation, slope, desert tortoise habitat**
  - MCAGCC study: slope, desert tortoise density
- **Other layers: soil characteristics, vegetation community**

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Evidence of Owl Occupation

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Nest Success and Productivity

- Nest Success: nesting attempt = occupied burrow with an owl pair

  successful nest = pair with one or more fledglings

  successful nests/nesting attempts

- Productivity: Number of fledglings documented during a series of three 30-min watches, each separated by at least 6 hours when young are 21-28 days post hatch

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