The Importance of Aquatic Birds to Peregrine Falcons within Lake Mead NRA

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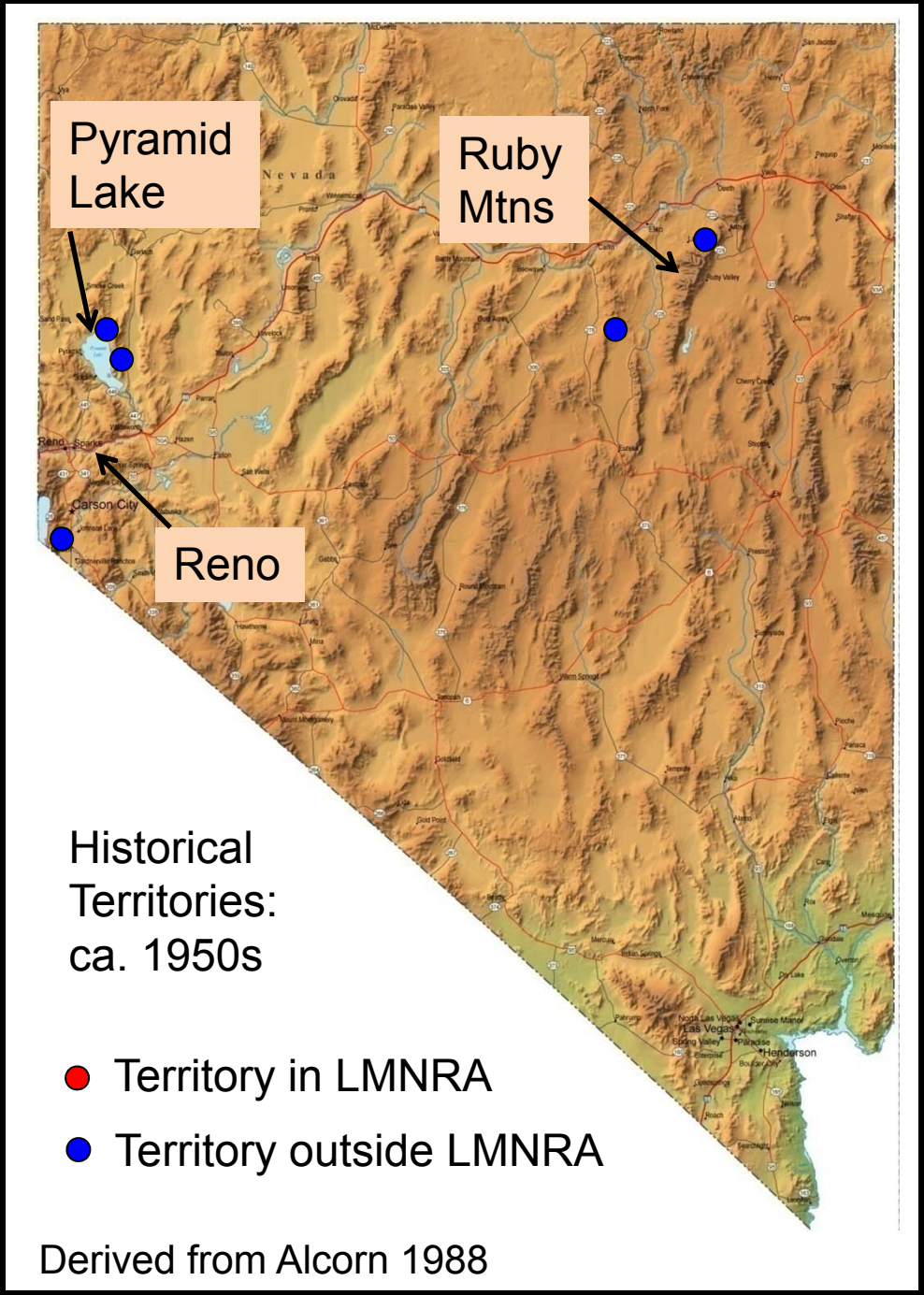
Overview

1. Habitat modification
2. Aquatic birds:
   - Species composition
   - Seasonal variation in numbers
3. Peregrine dietary assessment:
   - Prey composition (aquatic vs. terrestrial birds)
   - Seasonal shifts
   - Distance to water – impacts to reproduction
4. Peregrine susceptibility to contamination through diet

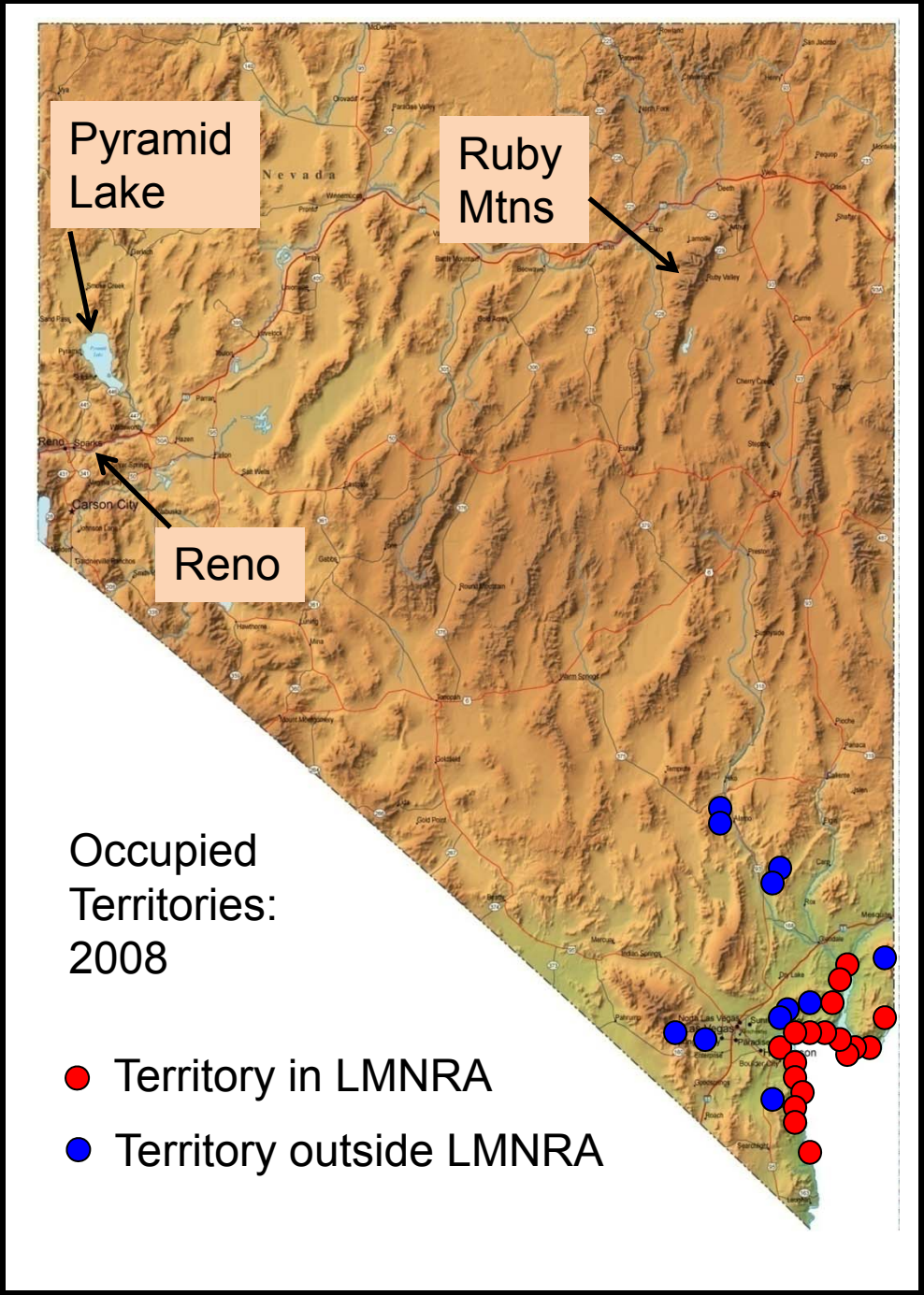
Historical Perspective

Known Peregrine Distribution in Nevada



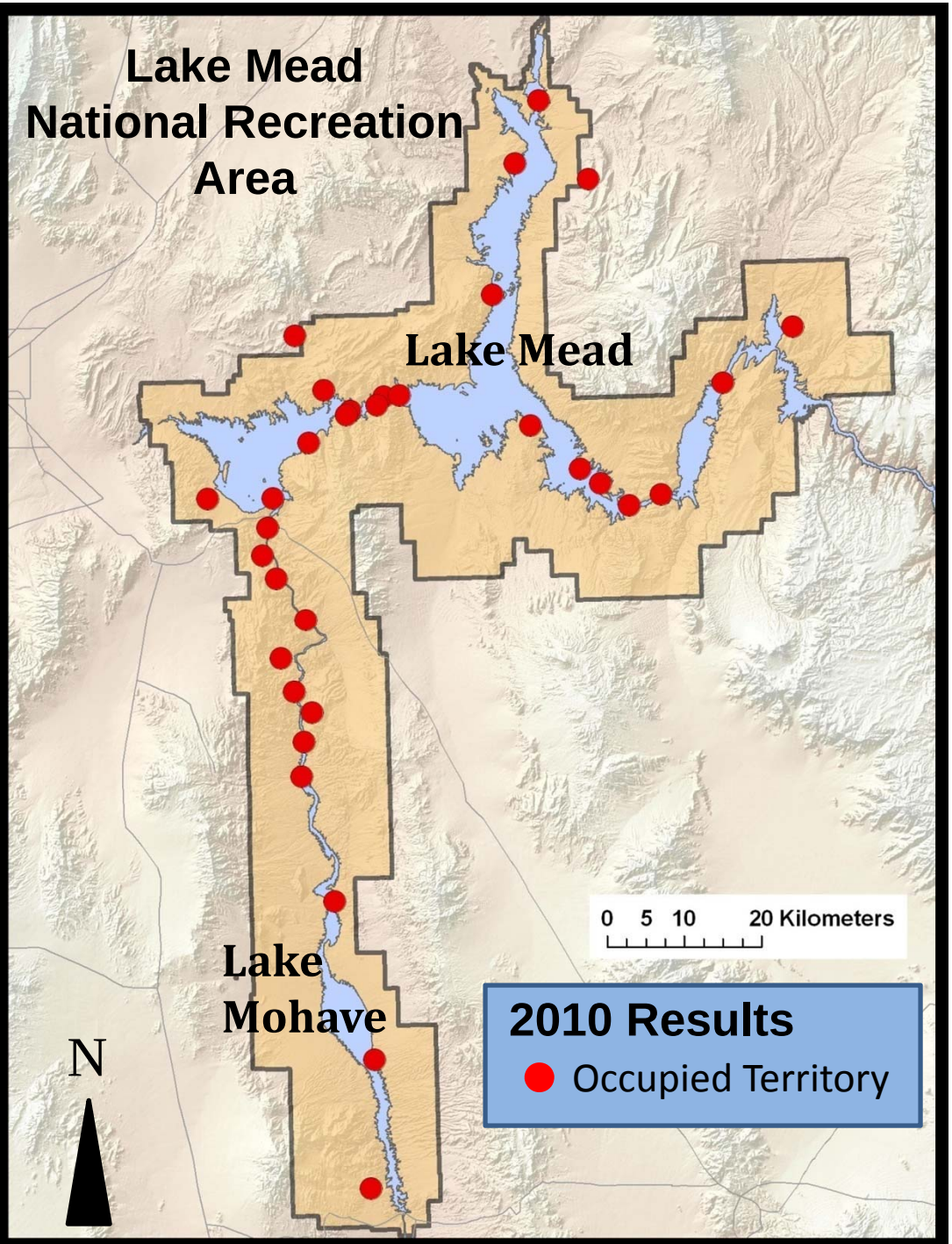
Derived from Alcorn 1988

Known Peregrine Distribution in Nevada



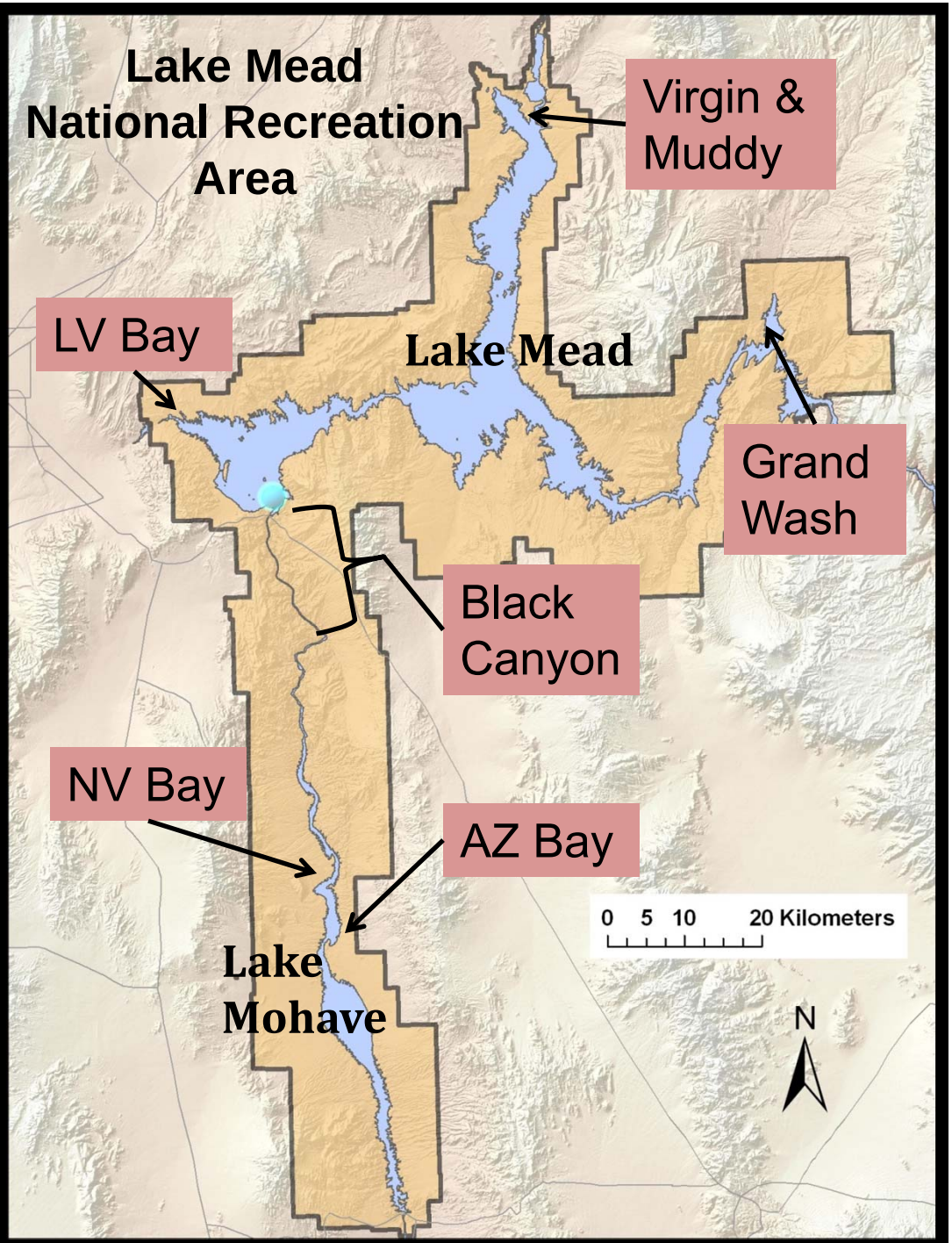
Peregrines in LMNRA

- 37 known territories as of 2010
- Median distance of eyrie to water: 159 m (mean = 886 m; range = 1–9,318 m)



Aquatic Bird Monitoring

- March 2004–August 2009
- Selected sites based on areas of high aquatic bird concentration
- Monthly tally of all aquatic birds and raptors



Aquatic Bird Monitoring Results

- 364 surveys of regular sites
- 243,081 birds tallied overall
- 94 species of aquatic birds represented

Most Abundant Aquatic Bird Species

Predominant Species	Total
American Coot	58,843
Eared Grebe	50,632
Clark's/Western Grebe	30,111
Ring-billed/CA Gull	19,570
Green-winged Teal	9,630
Ruddy Duck	7,728
American White Pelican	6,089
Least/Western Sandpiper	5,880
Northern Shoveler	5,700
American Avocet	4,928

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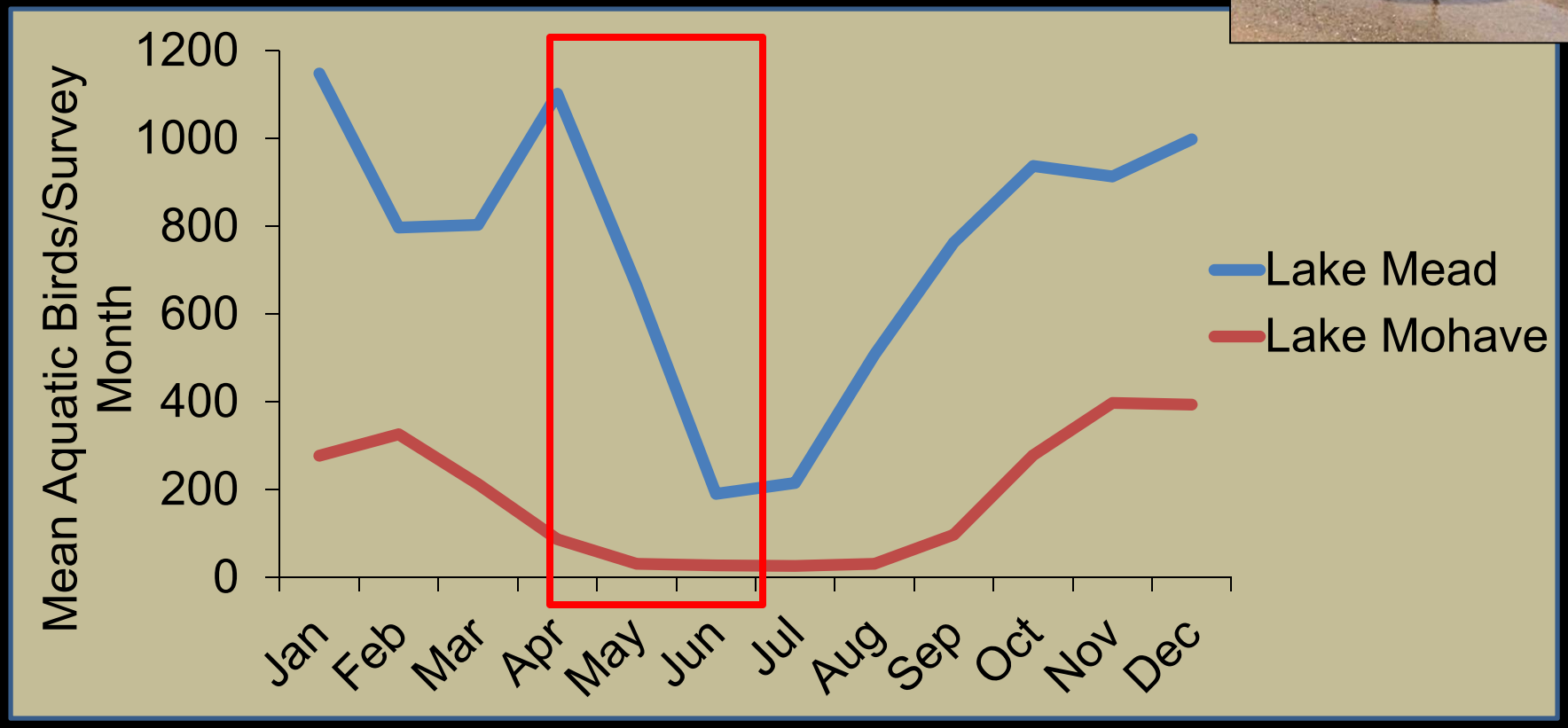
Aquatic Bird Seasonal Variability



- Earliest peregrine hatch date: 16 April

Peregrine Dietary Assessment

- Prey Attempt Observations (*n*=221; 2006-2010)
  - Tallied during territory surveys and at foraging grounds

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  - Tallied during territory surveys and at foraging grounds
- Prey Collection (*n*=216; 2008-2010)
  - Collected from nests and nearby plucking perches after fledging

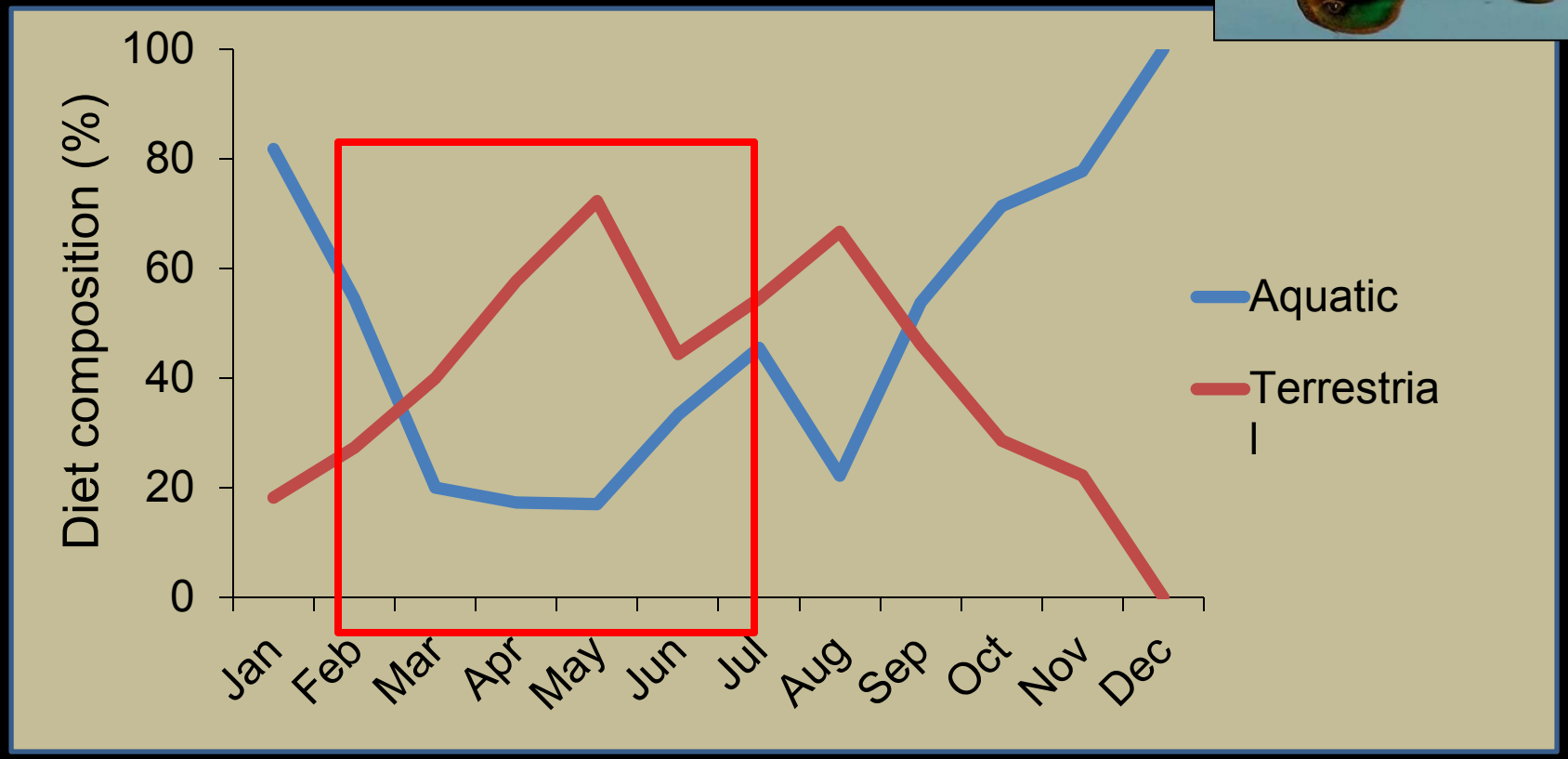
Peregrine Dietary Assessment

	Aquatic Bird	Terrestrial Bird
Prey Types*	29	38
Geometric Mean Mass (g)**	286	45
Frequency (%)	36.8	54.2
Biomass (%)	77.1	21.6

* 71 total prey types

** $F_{1,65} = 44.3$, $p < 0.0001$

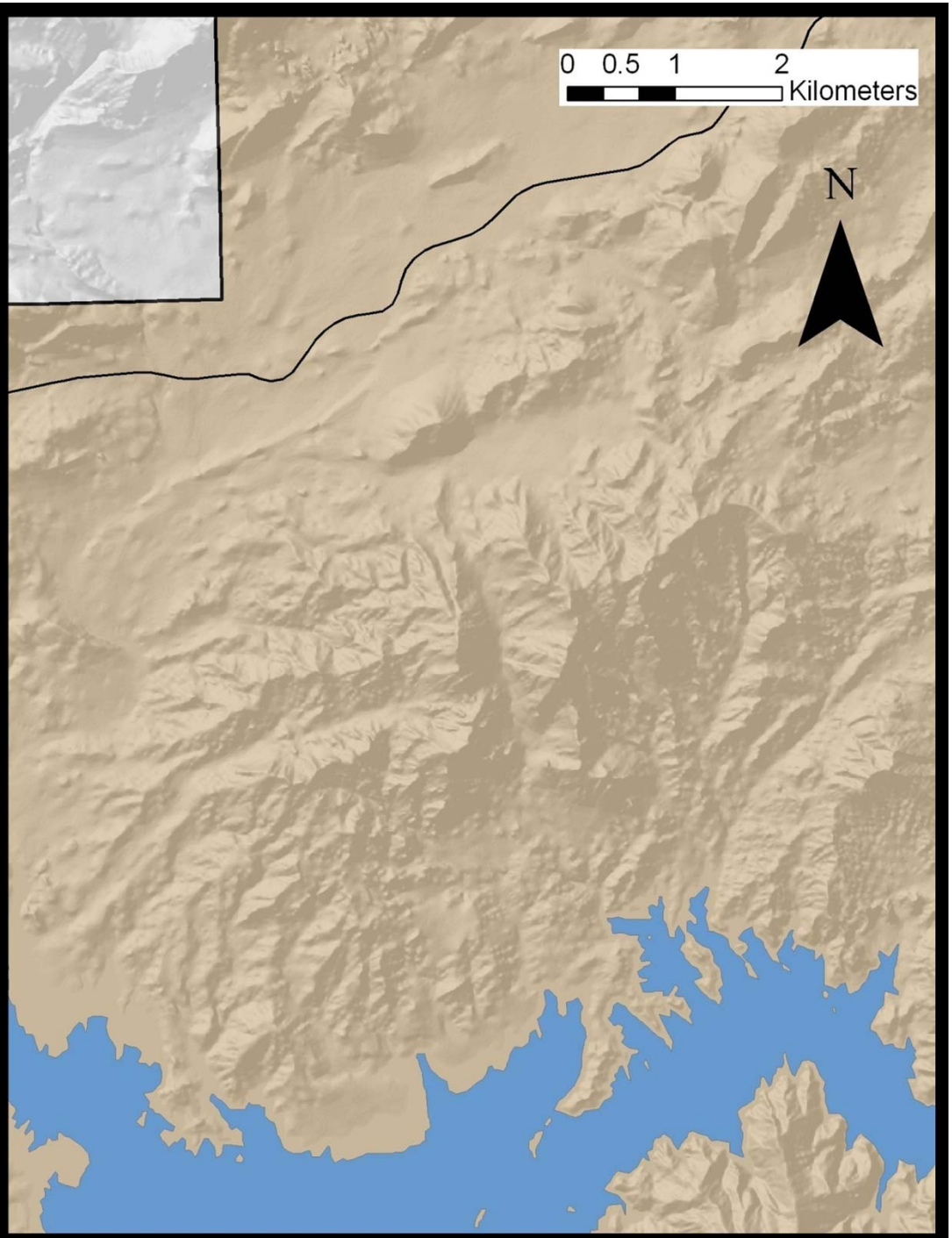
Diet shift over time: Prey Composition



- (χ^2 = 25, df = 3, p < 0.001)

Distance to water: prey acquisition

- Red dots are nest locations
- Distances measured from nest to shoreline



Prey Composition: Territories Near vs. Far from water

Data pooled: 2006–2010

	Prey Attempts	
	Near	Far
Sample Size	127	41
Aquatic Birds (%)	29.1	17.1
Mean Mass (g)	180.7	80.5

- Near < 640 m; Far ≥ 640 m
- 75% of observations < 600 m from eyrie

Prey Composition: Territories Near vs. Far from water

Data pooled: 2006–2010

	Prey Attempts		Prey Collection	
	Near	Far	Near	Far
Sample Size	127	41	168	45
Aquatic Birds (%)	29.1	17.1	36.3	40.0
Mean Mass (g)	180.7	80.5	182.8	150.6

- Near < 640 m; Far ≥ 640 m

Reproductive Output: distance to water

Data pooled: 2008–2010

Breeding Effort	Near	
Breeding Attempts	62	19
Success Rate	0.81	0.42
Young/Attempt	2.1	0.9
Total Young	131	17

- Near < 640 m; Far ≥ 640 m

Acknowledgments

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Summary

- Large numbers of aquatic birds supported by Lakes Mead and Mohave
- Peregrines have benefited from locally abundant prey base
- Proximity to water is important for sustaining high peregrine productivity
- Concentration of contaminants by quagga mussels may present health risks for peregrines