

Gambel's Quail

Callipepla gambelii



Photo by Amy Leist

Habitat Use Profile

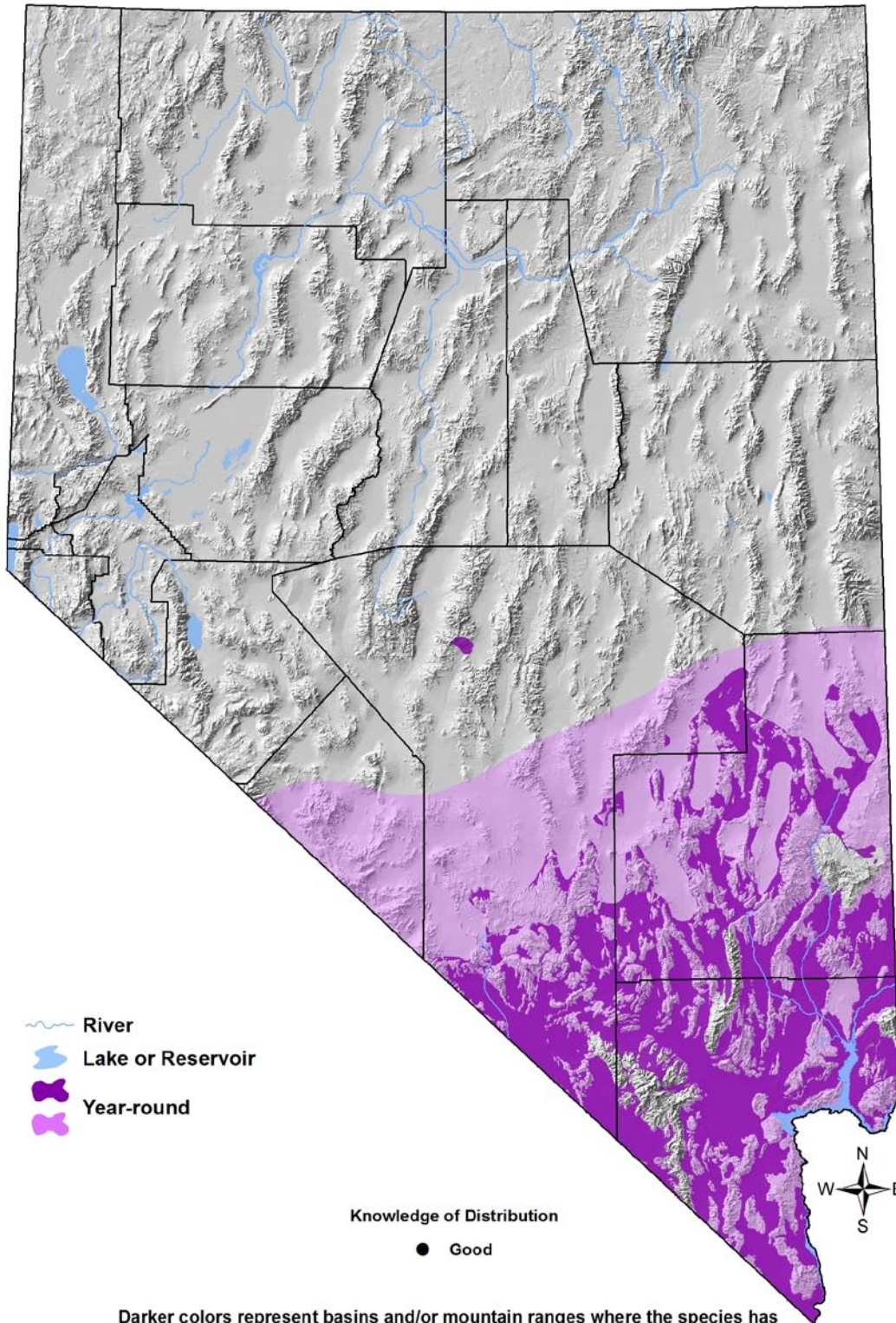
Habitats Used in Nevada	
Mesquite-Acacia Mojave Lowland Riparian Springs Agriculture	
Key Habitat Parameters •	
Plant Composition	Mesquite, acacia, salt cedar, willow, saltbush, prickly pear, cholla, desert thorn
Plant Density	Variable-density shrub and/or ground cover required (roost above ground) ^{1,7}
Mosaic	Shrubby patches near riparian, dry washes, or agriculture ^{1,7}
Distance to Water	< 1,000 m [0.6 mi] ^{1, EO}
Other	Attracted to wildlife guzzlers
Response to Vegetation Removal	Negative, but exotic weed control encouraged ^{EO}
Area Requirements •	
Minimum Patch Size	~ 10 ha [25 ac] ^{EO}
Recommended Patch Size	> 80 ha [200 ac] ^{EO}
Home Range	8 - 38 ha [20 - 94 ac] ^{1,7}

Conservation Profile

Priority Status	
Conservation Priority Species	
Species Concerns	
Historical declines Habitat threats Possible high stewardship responsibility	
Other Rankings	
Continental PIF	Stewardship Species
Audubon Watchlist	None
NV Natural Heritage	None
USFWS	None
BLM	None
USFS	None
NDOW	Upland Gamebird
NDOW Upland Game Plan	High Concern
Trends	
Historical •	Rangewide declines and contractions ¹
Recent •	Stable, but high annual variability ¹
Population Size Estimates	
Nevada (NBC) ◦	260,000
Global •	1,100,000 ⁶
Percent of Global	Up to 24%, but probably lower
Population Objective	
Maintain ^{6, EO}	
Monitoring Coverage	
Source	Nevada Bird Count
Coverage in NV	Good
Key Conservation Areas	
Protection	Lowland Riparian and Spring habitats in Clark and Nye counties
Restoration	Same
Natural History Profile	
Seasonal Presence in Nevada	
Year-round	
Known Breeding Dates in Nevada	
March – July ^{1,2}	
Nest and Nesting Habits	
Nest Placement	On ground under dense cover ¹
Site Fidelity	Unknown; probably high ^{EO}
Food Habits	
Basic	Ground forager
Primary Diet	Mesquite seeds, annual plants, cactus fruits ¹
Secondary Diet	Terrestrial insects during breeding ¹

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Darker colors represent basins and/or mountain ranges where the species has been recorded within the past 12 years. Lighter colors represent the broader area within which the species is presumed to occur in appropriate habitat types. Map adapted from NDOW (2008).

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Overview

Gambel's Quail is widely distributed in the brushy lowlands of southern Nevada, but its overall geographical range is limited to a subset of the Sonoran and Mojave Desert regions. Gambel's Quail may be found in a variety of habitat types where cover is sufficiently dense, and where water or succulent vegetation is available. Most spring breeding occurs in honey mesquite woodland, moving to denser screwbean mesquite or riparian habitats in the fall.⁷ Annual production and survival is dependent on winter precipitation and the resulting degree of "green-up" the following spring.¹ Annual plants are important in the early spring when mesquite pods are less available.⁷ Mortality within populations during dry years may reach 90%, but clutch size and survival may be very high during wet years.¹ Access to surface water improves survival rates, and NDOW has therefore constructed more than 400 artificial water sources in quail habitat in southern Nevada.³ In our recent analyses, these guzzlers were indeed associated with increased abundances of Gambel's Quail (see below). Even with water improvements, however, Gullion³ estimated that less than 7% of Nevada's Mojave region would be suitable for this species.

Because of their pronounced annual population fluctuations, it is difficult to determine this managed game bird's true conservation status. Analysis of NDOW's harvest data to shed additional light on long-term trends is therefore an important priority. Currently, invasive plants (particularly red brome) are considered a threat, particularly because they degrade habitat and increase the risk of fire and the consequent loss of woody vegetation.⁴ In the longer-term, Gambel's Quail's sensitivity to drought suggests that it could be vulnerable under some climate change scenarios.

Abundance and Occupancy by Habitat

Birds / 40 ha on NBC Transects in the Mojave Region

Primary Habitat at Transect	Transects Occupied	Birds/40 ha (95% C.I.)
Lowland Riparian	86% (31/36)	7.8 (5.3 – 10.3)
Mesquite-Acacia	76% (11/14)	8.8 (4.1 – 13.5)
Agriculture	80% (4/5)	8.9 (3.1 – 14.7)
Joshua Tree	35% (7/30)	4.6 (1.3 – 7.9)
Mojave Scrub	64% (14/22)	5.3 (3.0 – 7.6)

- Densities of 0.15 – 2.40 / ha [0.06 – 0.98 / ac] reported throughout range¹
- The BBS-derived Nevada population estimate⁶ of 14,000 is much smaller than the NBC-derived estimate of 260,000 birds. It is not clear at this time which estimate is more accurate. Based on the table above, NBC data may have overestimated the density of Gambel's Quail in Mojave Scrub habitat, which would have inflated the population size estimate

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Nevada-Specific Studies and Analyses

Landscape Associations (NBC data)

Statistical analysis (*Appendix 3*) of data from 176 NBC transects within the Mojave region indicated a strong and significant association between Gambel's Quail abundance and Lowland Riparian, Mesquite-Acacia, Agriculture, and to a lesser extent Mojave Scrub habitats. There was also a strong and significant association between Gambel's Quail abundance and proximity to water sources (streams, springs, or guzzlers). This association became non-significant if guzzlers were removed from the analysis, so it appears very likely that guzzlers promote higher quail numbers, at least locally.

Gullion Study

In 1960 Gullion³ published a peer-reviewed study of the basic ecology of Gambel's Quail in Nevada, which may provide useful baseline information

Main Threats and Challenges

Habitat Threats

- Fire has affected > 3,600 km² [900,000 ac] of quail habitat in southern Nevada in recent years; this commonly results in invasion of red brome, which may then promote more frequent fires that prevent or slow re-establishment of native vegetation⁵
- Loss or degradation of habitat due to:
 - Invasive plants (particularly red brome, see above)⁴
 - Wild horse and burro grazing
 - Urban and suburban development
 - Energy development
 - Other Mojave Lowland Riparian habitat threats (p. Hab-11-1)
- Loss or degradation of water sources

Research, Planning, and Monitoring Challenges

- Pronounced annual fluctuations in numbers and survival makes it difficult to detect underlying long-term population trends

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Conservation Strategies

Established Strategies

- NDOW, in conjunction with the Western Quail Management Plan,⁸ has developed detailed conservation and management priorities for the Gambel's Quail,⁵ with key elements including:
 - Protecting unburned habitat from fire and subsequent red brome invasion
 - Maintaining wild horses and burros in quail habitat at the lower range of defined Appropriate Management Levels
 - Support of post-fire habitat restoration and stabilization efforts
 - Maintaining existing artificial water sources, and establishing new artificial sources where appropriate
 - Protecting or restoring natural water sources
 - Improving weed control efforts
 - Re-establishing populations in previously-occupied areas where appropriate and feasible
 - Creating an improved and detailed map of current Gambel's Quail distribution

Habitat Strategies

- Mesquite-Acacia (p. Hab-10-1), Mojave Lowland Riparian (p. Hab-11-1), Springs (p. Hab-19-1), and Agriculture (p. Hab-1-1) habitat conservation strategies benefit this species
- New developments (residential, industrial, energy) should be sited where possible to avoid impacting high-quality Gambel's Quail habitat
- Feral and free-ranging cat control may be useful where occupied habitat adjoins residential areas

Research, Planning, and Monitoring Strategies

- Analyze NDOW harvest data to better determine long-term population trends
- Additional research should focus on determining seasonal water needs, grazing impacts, and microhabitat characteristics of nest sites⁷

Public Outreach Strategies

- Encourage pet owners near occupied habitat to keep cats indoors

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References: ¹Brown et al. (1998); ²GBBO unpublished Atlas data; ³Gullion (1960); ⁴Kuvlesky et al. (1992); ⁵NDOW (2008); ⁶Rich et al. (2004); ⁷Rosenberg et al. (1991); ⁸Zornes and Bishop (2009); ^{EO} Expert opinion



Gambel's Quail habitat at Bird Canyon Springs. Photo by Dawn Fletcher