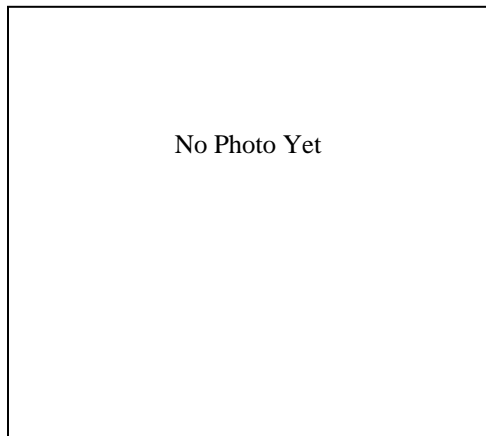


# Gambel's Quail

*Callipepla gambelii*

## Conservation Profile



<b>Priority Status</b>	Conservation Target
<b>Reasons for Priority Status</b>	Threats Historical declines
<b>Other Rankings</b>	Continental PIF: Stewardship Species Audubon Watchlist: None Natural Heritage: None USFWS: None BLM: None NDOW: "High" concern in Nevada Upland Game Management Plan
<b>Trends</b>	Historical: Declines and range contractions [p1] Recent: Appears stable but subject to substantial annual variation [p1]
<b>Population Size Estimates</b>	Nevada (NBC): 260,000 Nevada (PIF): 14,000 Global: 1,100,000 [p5] Percent of Global: 1 – 23 % [clarify]
<b>Population Objective</b>	TBD
<b>Monitoring Coverage</b>	Source: Nevada Bird Count Coverage and Adequacy: Excellent
<b>Key Conservation Areas</b>	Clark and Nye counties lowland riparian areas

## Habitat Use Profile

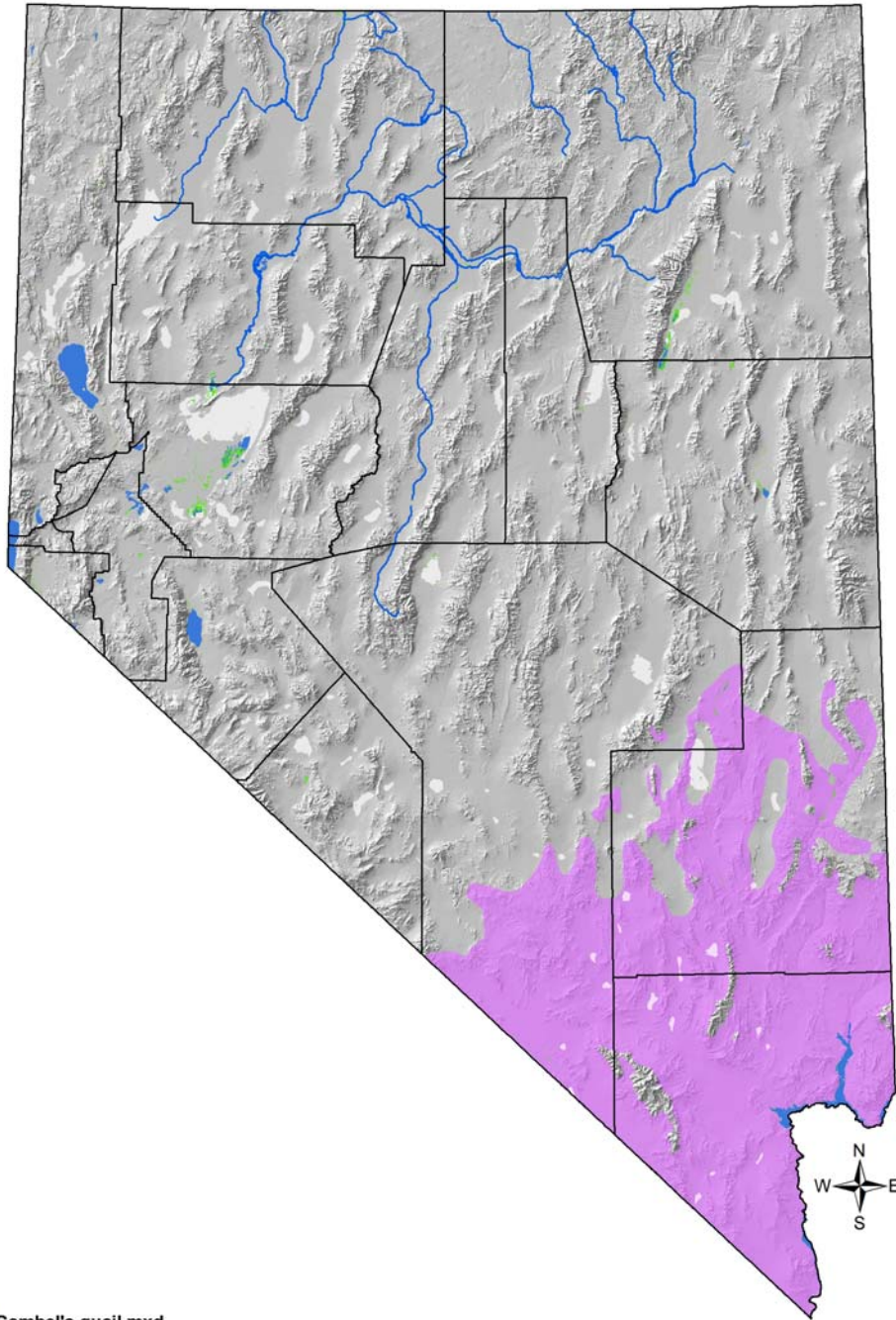
<b>Main Habitats Used in Nevada</b>	Mojave Desert Lowland Riparian Mesquite-Catclaw Mojave Scrub
<b>Key Habitat Use Parameters</b>	Mixed species shrubland / woodland, including mesquite, tamarisk, saltbushes, prickly pear, chollas, desert thorns [p1] Coveys tend to congregate near waterways and washes where vegetation is more dense [p1] Access to surface water may be necessary seasonally, and increases survival rates [p1, EO]
<b>Minimum Patch Size</b>	Unknown, but small patches are probably acceptable Home ranges for coveys 8 – 38 ha [Western Quail Management Plan, p1]

## Natural History Profile

<b>Seasonal Presence in Nevada</b>	Year-round
<b>Known Breeding Dates in Nevada</b>	March – July [s4, p1]
<b>Nesting Habits</b>	Nest on ground underneath shrub or other overhead cover [p1]
<b>Food Requirements</b>	Mainly plant material (especially mesquite) including seeds, leaves, fruit; some insects seasonally [p1]

# Gambel's Quail

*Callipepla gambelii*



File: Gambel's quail.mxd

# Gambel's Quail

*Callipepla gambelii*

## Temporary Map Key

Pink: Breeding range

Hot pink / magenta: For some birds, breeding data was limited, and was supplemented by extrapolation to include likely breeding range. In these cases, hot pink represents known breeding range, and lighter pink the extrapolated breeding range.

Blue: Winter range

Yellow: Important migration stopover areas

Purple: Year-round range

Green: In some maps, wetlands mapped by SWReGAP are shown in green for interpretational purposes

Dot symbols: In cases where breeding records were isolated or very restricted in extent, they are represented by a pink dot symbol rather than a shaded area.

Arrows: Major migration routes. These are shown only for birds for which there are migration-associated conservation issues.

## OVERVIEW

Gambel's Quail is widely distributed in the brushy lowlands of southern Nevada [p4], but its overall geographical range is limited to the Sonoran and Mojave regions. It may be found in a variety of habitat types where cover is sufficient and where water or succulent vegetation are available. Annual production and survival is dependent on winter precipitation and the resulting degree of "green-up" the following spring [p1]. Mortality within populations during dry years may reach 90%; conversely, clutch size and survival may be very high during wet years [p1]. Access to surface water improves survival rates, and the Nevada Department of Wildlife has consequently constructed more than 400 artificial water sources in quail habitat in southern Nevada. In our recent analyses, these guzzlers were indeed associated with increased abundances of Gambel's Quail. As a managed game bird, conservation strategies have been codified in the Nevada Upland Game Species Management Plan (NDOW [\_\_\_\_]) and the Western Quail Species Management Plan [\_\_\_\_].

## Gambel's Quail

*Callipepla gambelii*

### ABUNDANCE AND OCCUPANCY BY HABITAT

- Densities of 0.15 – 2.4 / ha reported throughout range [p1]
- NBC Transects (percent column actually refers to **proportion** of transects occupied)

	% Transects Occupied (Mojave)
Agricultural	0.8 (4/5)
Joshua Tree	0.35 (7/20)
Lowland Riparian	0.86 (31/36)
Mesquite-Catclaw	0.79 (11/14)
Mojave Scrub	0.64 (14/22)
Montane Riparian	0.22 (2/9)
Montane Sagebrush	0.33 (1/3)
Montane Shrublands	0.8 (4/5)
Pinyon-Juniper	0.17 (2/12)
Salt Desert	0.4 (4/10)
Wetland	0.5 (1/2)

### NEVADA-SPECIFIC STUDIES AND ANALYSES

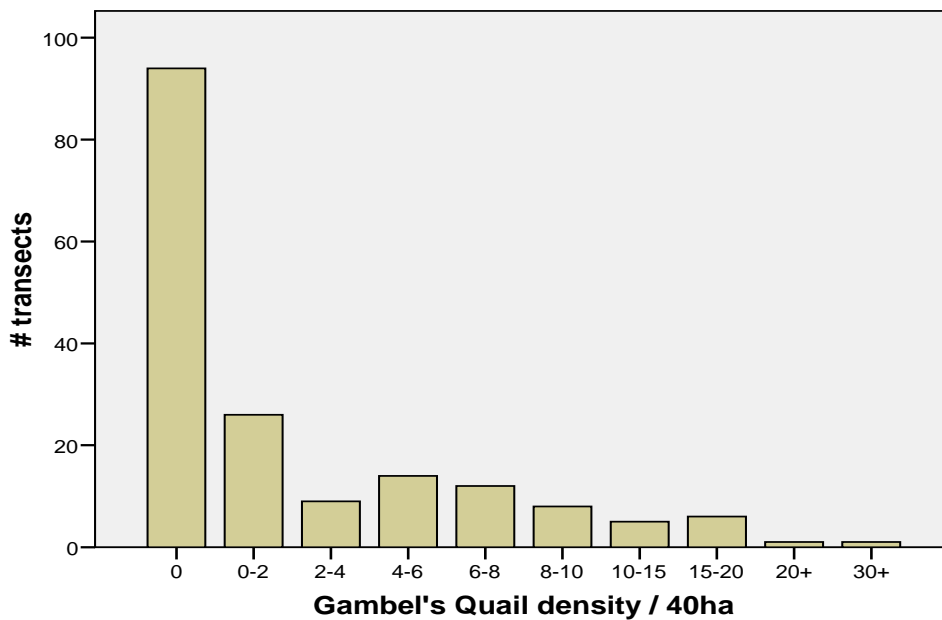
- NBC data: logistic regression and linear regression p-values for the Mojave region (176 transects):

Veg Type (Proportion)	Coef	S+4 only (logit)	Linear regression
Mojave Scrub	+	<b>0.002</b>	<b>0.241</b>
Mesquite-Catclaw	+	<b>0.016</b>	<b>&lt;0.001</b>
Salt Desert	-	0.457	0.556
Sagebrush	-	0.017	<0.001
Pinyon-Juniper	-	0.229	0.014
Montane Sage	-	0.096	0.004
Montane Riparian	-	0.011	0.017
Coniferous Forest	-	0.317	0.174
Lowland Riparian	+	<b>&lt;0.001</b>	<b>&lt;0.001</b>
Agricultural	+	<b>0.029</b>	<b>&lt;0.001</b>
Developed	+	0.605	0.084
DIST. To H20 (strms or sprngs)	-	0.752	0.182
DIST. To H20 (strms, sprngs, OR guzzlers)	-	0.119	<b>0.006</b>

## Gambel's Quail

*Callipepla gambelii*

- As expected, Gambel's Quail are associated with shrubby lowland habitats in southern Nevada, and are also found near human developments in many cases
- According to linear regression, there was a strong significant association between Gambel's Quail density and proximity to water sources (streams, springs, or guzzlers). This association was weaker if guzzlers were removed from the analysis, so it appears likely that guzzlers to indeed promote higher quail numbers
- Observed density of quail varied a great deal over surveyed transects in southern Nevada, as shown in the figure below. This is indicative of variable covey size in different areas and at different times



### MAIN THREATS AND CHALLENGES

- Fire has affected > 900,000 acres of habitat in southern Nevada in recent years, which commonly results in invasion of red brome (Nevada Upland Game Species Management Plan, NDOW 2009 [\_\_\_\_])
- Wild horse and burro grazing
- Invasive plants (red brome)
- Urban / suburban development
- Loss or degradation of existing water sources

# Gambel's Quail

*Callipepla gambelii*

## CONSERVATION STRATEGIES

### Proscribed Strategies

- As a harvested game bird, management goals and conservation strategies for Gambel's Quail are defined in the Nevada Upland Game Species Management Plan (NDOW [\_\_\_\_]) and in the Western Quail Species Management Plan [\_\_\_\_]. Key elements of these goals and strategies are:
  - Creation of a fine-grained map of Gambel's Quail occurrence
  - Re-establishment of birds in previously-occupied areas, where allowable and feasible
  - Protection of unburned habitat from fire and subsequent red brome invasion
  - Maintaining wild horse and burro numbers at the lower range of defined Appropriate Management Levels
  - Improving weed control efforts
  - Supporting post-fire habitat restoration and stabilization efforts
  - Maintaining existing artificial water sources for Gambel's Quail, and creating new sources in occupied habitat
  - Protecting and/or restoring existing natural water sources for Gambel's Quail

### Research, Planning, and Monitoring

- Additional research should be conducted to examine seasonal water needs, grazing impacts, and nesting requirements (Western Quail Species Management Plan [\_\_\_\_])

### Other

- Additionally, new developments (residential, industrial, energy) should be sited where possible to avoid impacting high-quality Gambel's Quail habitat
- Feral cat control useful in habitat located near residential areas

## OTHER SPECIES WITH SIMILAR STRATEGIES

- Abert's Towhee

## FURTHER READING

- TBD

# Gambel's Quail

*Callipepla gambelii*

## Temporary codes for standard references

- [p1] Birds of N. America account for this species
- [p2] NV Bird Conservation Plan ver. 1 (Neel 1999)
- [p3] NV Wildlife Action Plan
- [p4] Nevada Breeding Bird Atlas
- [p5] PIF N. American Landbird Conservation Plan (Rich et al 2004) (NOTE:
- [p6] Intermountain West Regional Shorebird Plan (Oring et al 2003)
- [p7] Pacific Flyway reports
- [p8] Shrubsteppe Landscapes in Jeopardy (Dobkin and Sauder 2004)
- [p9] Birds in a Sagebrush Sea (Paige and Ritter 1999)
- [s1] NBC-based population size estimates
- [s2, s3] NBC-based habitat relationship analysis
- [s4] Breeding Bird Atlas breeding phenology data
- [i1] BBS trends analysis (Sauer et al 2005)
- [i2] NV Upland Game Management Plan (Espinosa et al in prep.)
- [i3] Western Quail Management Plan (Zornes et al 2008)
- [i4] NDOW Shorebird and Waterbird monitoring data (Neel)
- [i5] Brad Andres IMJV Shorebird / Waterbird data set
- [i6] GBBO Technical Report 08-01 (2008)
- [EO] Expert opinion from NVPIF group members
- [IWWCP] Intermountain West Waterbird Conservation Plan
- [NAWCP] North American Waterbird Conservation Plan
- [LBCUSACP] Long-billed Curlew Status Assessment and Conservation Plan
- [USSCP] U.S. Shorebird Conservation Plan
- [WHSRN] Western Hemispheric Shorebird Regional Network