California Wildlife Habitat Relationships System
California Department of Fish and Wildlife
California Interagency Wildlife Task Group

GAMBEL'S QUAIL *Callipepla gambelii*
Family: ODONTOPHORIDAE Order: GALLIFORMES Class: AVES
B139

Written by: E. C. Beedy
Reviewed by: L. Mewaldt
Edited by: S. Granholm, R. Duke

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A common resident of Colorado and Mojave Desert regions of southeastern California. Preferred habitats include desert riparian, and a wide variety of other desert types, especially near streams, springs, and water holes. Frequents both valleys and steep hillsides. Associated plants include Baccharis glutinosa, Atriplex, Acacia, Prosopis, Opuntia, and Yucca (Johnsgard 1973). Also found in Tamarix, but not common in pure stands that now dominate portions of the Salton Sea district (Garrett and Dunn 1981). Occurs along the Colorado River, west to Borrego Valley (San Diego Co.) and the Mojave River (San Bernardino Co.). Range extends north locally in the Mojave Desert to the Amargosa River, southern Inyo Co., and has been introduced successfully near Furnace Creek. Normally found at low elevations, but ranges up to 1636 m (5400 ft) in the Providence Mts. Successfully introduced to San Clemente Island, where now common (Grinnell and Miller 1944, Garrett and Dunn 1981). Range in southern California may have increased following irrigation of deserts.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Forages in open habitats interspersed with patches of shrubs, trees or brush piles. Adult eats mostly plant material, gleaning forb, shrub, and grass seeds from the ground surface. Lotus, Lupinus, Astragalus, and Erodium are important (Gullion 1962, Grenfell et al. 1980). Succulent forbs and grasses are highly favored when available (Hungerford 1962). Chick feeds initially on insects (Harrison 1978), but soon acquires vegetarian diet.

Cover: Escape cover, usually provided by trees or tall shrubs, required; amount may control covey size (Grinnell and Miller 1944).

Reproduction: Nest built on the ground in a variety af desert habitats; shaded from direct sun by low foliage of trees or shrubs (Harrison 1978). Nest typically shallow depression lined with grasses or other vegetation. Unusual sites in Tamarix and orchard trees, at heights 2.1-6.1 m (7-20 ft), were reported by Neff (1941).

Water: Most commonly seen near water (Grinnell and Miller 1944). Miller and Stebbins (1964) did not observe a covey more than 2.4 km (1.5 mi) from permanent water at Joshua Tree National Monument. Although water may be critical in hot summer, it may not be required for drinking at other times, if temperatures and humidities are moderate, and succulent plants are available to eat (Gullion 1962).

Pattern: Frequents desert habitats, preferably with open foraging sites interspersed by escape cover, with permanent water nearby. In New Mexico, occupies patches of favorable habitat along irrigation ditches, but apparently croplands little used (Raitt and Ohmart 1966).

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity. In early morning, travels by foot to a source of water, then feeds for several hours (Edminster 1954).

Seasonal Movements/Migration: Non-migratory in California (Grinnell and Miller 1944).

Home Range: Ten coveys in Nevada thorn scrub had home ranges varying from 7.6 to 38 ha (19-95 ac), with a mean of 14.3 ha (35.7 ac) (Gullion 1962). At the same study site, average population density was 0.64 ha (1.6 ac) per bird. In Arizona, Hensley (1954) determined breeding densities of 1 pair/6.6 ha (16.6 ac), and 1 pair/3.2 ha (8 ac) at 2 sites.

Territory: Male does not defend a territory, but becomes increasingly aggressive towards other males as nesting season approaches. This leads to dissolution of winter coveys (Raitt and Ohmart 1966).

Reproduction: Nesting season of variable duration, depending on rainfall, but usually begins in April and ends in June or July. Green feed necessary for successful nesting. In years of low winter or spring rainfall, may not nest at all (Mallette and Slosson 1980). Pair strongly monogamous (Johnsgard 1973). Clutch size 12-14 eggs (Gorsuch 1934). Usually single-brooded, but may be double-brooded in wet years (Harrison 1978). Incubation 21-23 days. Female incubates while males guards, but both may brood. Chicks precocial; become independent by 4 wk (Harrison 1978).

Niche: Adapted to desert living; has tolerance for high temperatures (Henderson 1971) and saline drinking water (McNabb 1969). Closely related to California quail; the 2 ranges overlap near San Gorgonio Pass, Riverside Co. (Garrett and Dunn 1981). Hybrids have been recorded in this area. Also occurs with mountain quail at about 1500 m (5000 ft) in Joshua Tree National Monument. Vulnerable to Cooper's hawks, sharp-shinned hawks, great horned owls, bobcats, and snakes, which are described by Leopold (1977) as important predators of California quail. A favored game species; 350,000 to 400,000 harvested annually in California (Mallette and Slosson 1980).

REFERENCES

Bent, A. C. 1932. Life histories of North American gallinaceous birds. U.S. Natl. Mus. Bull. 162. 490pp.

Edminster, F. C. 1954. American game birds of field and forest. Scribner's Sons, New York. 490pp.

Garrett, K., and J. Dunn. 1981. Birds of southern California. Los Angeles Audubon Soc. 408pp.

Gorsuch, D. M. 1934. Life history of the Gambel quail in Arizona. Univ. Arizona Bull. 5:1-89.

Grenfell, W. E., B. M. Browning, and W. E. Stienecker. 1980. Food habits of California upland game birds. Calif. Dep. Fish and Game, Sacramento. Wildl. Manage. Br. Admin. Rep. No. 80-1. 130pp.

Grinnell, J., and A. H. Miller. 1944. The distribution of the birds of California. Pac. Coast Avifauna No. 27. 608pp.

Gullion, G. W. 1960. The ecology of Gambel's quail in Nevada and the arid southwest. Ecology 41:518-536.

Gullion, G. W. 1962. Organization and movements of coveys of a Gambel quail population. Condor 64:402-415.

Harrison, C. 1978. A field guide to the nests, eggs and nestlings of North American birds. W. Collins Sons and Co., Cleveland, OH. 416pp.

Harrison, C. J. O., ed. 1978. Bird families of the world. Harry N. Abrams, Inc., New York. 264pp.

Henderson, C. W. 1971. Comparative temperature and moisture responses in Gambel and scaled quail. Condor 73:430-436.

Hensley, M. M. 1954. Ecological relations of the breeding bird population of the desert biome in Arizona. Ecol. Monogr. 234:185-207.

Hungerford, C. R. 1962. Adaptations shown in the selection of food by Gambel quail.

Condor 64:213-219.
Johnsgard, P. A. 1973. Grouse and quails of North America. Univ. Nebraska Press, Lincoln. 553pp.
Leopold, A. S. 1977. The California quail. Univ. California Press. Berkeley. 281pp.
Mallette, R. D., and J. R. Slosson. 1980. Upland game of California. Calif. Dep. Fish and Game, Sacramento. 76pp.
McNabb, F. M. A. 1969. A comparative study of water balance in three species of quail II. Utilization of saline drinking solutions. Comp. Biochem. Physiol. 28:1059-1074.
Miller, A. H., and R. C. Stebbins. 1964. The lives of desert animals in Joshua Tree National Monument. Univ. California Press, Berkeley. 452pp.
Neff, J. A. 1941. Arboreal nests of the Gambel quail in Arizona. Condor 43:117-118.
Raitt, R. J., and R. D. Ohmart. 1966. Annual cycle of reproduction and molt in Gambel quail of the Rio Grande Valley, southern New Mexico. Condor 68:541-561.
Terres, J. K. 1980. The Audubon Society encyclopedia of North American birds. A. Knopf, New York. 1100pp.

Life history accounts for species in the California Wildlife Habitat Relationships (CWHR) System were originally published in: Zeiner, D.C., W.F.Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Depart. of Fish and Game, Sacramento, California. Updates are noted in accounts that have been added or edited since original publication.