

Gambel's Quail: Riparian Bird of the Trans-Pecos

News from the Borderlands Research Institute for Natural Resource Management at Sul Ross State University

article and photo by Dr. Louis A. Harveson

Texas boasts an abundance and diversity of quail unparalleled among other states. All four species of quail occur in distinct Trans-Pecos habitats: Bobwhites reside along the eastern edge, scaled quail are ubiquitous throughout the region, Montezuma are limited to wooded habitats in the upper elevations, and Gambel's quail occupy the western extreme of the Trans-Pecos.

With declining populations of bobwhites occurring throughout the southeastern United States, there has been a renewed interest in western quail species. Partnering with local landowners, the Texas Parks and Wildlife Department, and Quail Unlimited, the Desert Quail Research Program at Sul Ross State University initiated the first ecological study of Gambel's quail in Texas. Our objectives were to establish baseline information on Gambel's quail with respect to distribution, diet, demography and habitat use.

To do so, we established two study sites in Hudspeth County for our investigation: one located in the heart of Gambel's quail habitat located along the Rio Grande and another, Lasca Road, about 75 miles from the Rio Grande.

We determined the distribution of Gambel's quail in Texas using a combination of road surveys, call counts, and GIS mapping. Gambel's quail were strongly associated with desert riparian habitats below 4,400 feet in far west Texas. Gambel's quail are found from El Paso to the Big Bend in the basins that feed into the Rio Grande.

Seasonal diets of Gambel's quail were determined for a two-year period by harvesting 392 birds and examining crop contents from across their distribution. Twenty foods made up 91.1 percent of the volume of all items eaten. Forb seeds were the most consumed food type, followed by fruits of woody perennials, seeds of woody perennials, green vegeta-

tion, animal material and grass seeds. Many of the primary foods for Gambel's quail (Russian thistle, desert willow, Greg's catclaw, mesquite, littleleaf sumac) also provided critical escape, loafing and roosting cover.

Gambel's quail density was estimated for our two study sites using belt transects monitored on ATVs. In general, densities decreased farther from the Rio Grande. Native habitats along the Rio Grande had higher densities than habitats dominated by the invasive, exotic salt cedar (tamarisk). On our Rio Grande study site, Gambel's quail densities averaged 329 birds per square mile, compared to 217 birds per square mile on our Lasca Road study site.

We captured and banded 359 Gambel's quail to better understand their reproductive strategies, productivity, and population structure. Male-to-female sex ratios were approximately equal, whereas age ratios (an index to productivity) varied from one to four juveniles per adult. Annual survival rates did not differ between years and did not differ among study sites and ranged from 23 to 42 percent. Avian and mammalian predators accounted for 23 and 52 percent, respectively, of known mortalities. Mammals were the primary predators in thick-canopied habitats dominated by salt cedar, and raptors were the primary predator in the more open, native riparian areas.

By monitoring radio-tagged quail, we were able to determine how Gambel's quail use different habitats. We delineated habitats into three broad categories: native riparian, salt cedar, and upland habitats. On our Rio Grande study site, all three habitats were available, but only upland and native riparian habitats were available on our Lasca Road study site. In the absence of salt cedar, Gambel's quail used native riparian habitats 84 percent of the time on the Lasca Road study site. On

the Rio Grande study site (where salt cedar dominated the landscape), Gambel's quail selected native riparian 66 percent of the time, salt cedar 31 percent of the time, and upland habitats only three percent of the time. This strong affinity toward riparian habitats—either native or introduced—stresses the importance of riparian zones in Gambel's quail conservation and management.

Gambel's quail reside in the most arid rangelands of Texas. To survive, they are dependent on riparian habitats. Based on our findings, Gambel's quail occur almost exclusively in this habitat type. Woody plants are particularly important in these habitats and provide food, loafing cover, nesting and roosting cover. Although salt cedar has invaded these habitats, Gambel's quail still used salt cedar-dominated habitats, but showed a preference for native riparian habitat. 🐦



TPWD biologist and former SRSU graduate student Michael Sullins with a male Gambel's quail that was captured, radioed, and monitored during his west Texas study. Male Gambel's quail have an ornate plume, black face and throat patch and a rust-colored cap.



The Cross Timbers Chapter of Quail Unlimited proudly supports the Desert Quail Research Program of the Borderlands Research Institute.