



Scaled Quail

Habitat use in association with supplemental feed and water

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Photos courtesy of **ERNESTO GARCIA ORTEGA**

West Texas, or as some people refer to it “God’s country,” is a very unique region that encompasses a portion of the Chihuahuan desert ecosystem. It consists of 92,815 square miles and is one of the most wildlife diverse areas in Texas. Among the species found in this area, there is one that stands out as an icon—the Scaled Quail (*Callipepla squamata*). It is one of the most charismatic species of the Trans-Pecos. In addition to being photogenic, this species is a challenging quarry for hunters as well as bird dogs.

Scaled Quail, also known as Blue Quail, is an upland game bird considered as one of the most ecologically and economically important wildlife species in the Trans-Pecos region. Its distribution encompasses roughly the western half of Texas, inhabiting the western portions of the Rolling Plains, Edwards Plateau and South Texas Plains. However, populations of the Scaled Quail have been in decline since the 1960s. Although it is unknown what specifically has been responsible for this decline, suggested causes have included severe weather events, changes in landscape characteristics resulting from woody brush encroachment, overgrazing practices and wildlife diseases or parasites.

In order to better understand what factors might be influencing quail populations in the Trans-Pecos, the Borderlands Research Institute created the Desert Quail Research



This Scaled Quail forages in the Trans-Pecos region of Texas. In addition to being photogenic, this species is a challenging quarry for hunters as well as bird dogs.

Program. Current desert quail research is obtaining data that yields information on the ecology, population dynamics and survival of scaled, Gambel’s (*Callipepla gambelii*) and Montezuma (*Cyrtonyx montezumae*) Quail in the Trans-Pecos. Having support from private landowners and quail advocates such as Park Cities Quail, Quail Coalition, Quail Forever and Dow AgroSciences, projects are being implemented to help restore habitat and provide landowners valuable information on management tools to improve quail habitat.

One practice currently implemented on many ranches in the Trans-Pecos in an effort to improve survival and recruitment is the use of supplemental feed. Therefore, one of the goals of our research is to evaluate the influence of supplemental feed on habitat use, nest site selection and survival. In order to

assess habitat use in the area, 80 female quail were equipped with Very High Frequency (VHF) telemetry units during 2014 and 2015. Females were tracked via VHF, and their locations were recorded with a Global Positioning System (GPS) unit. Scaled Quail females were tracked and monitored from mid-April to early September each year. Additionally, during the nesting season, nest site location, nesting cover type, clutch size and nest success were also documented.

A portion of the study examined the distance quail travel from supplemental water and feed sources. Supplemental feed has always been a subject of contention. Some research has shown that it is beneficial to survival, while other studies indicate that it has no bearing on quail survival and only concentrates quail in the area.

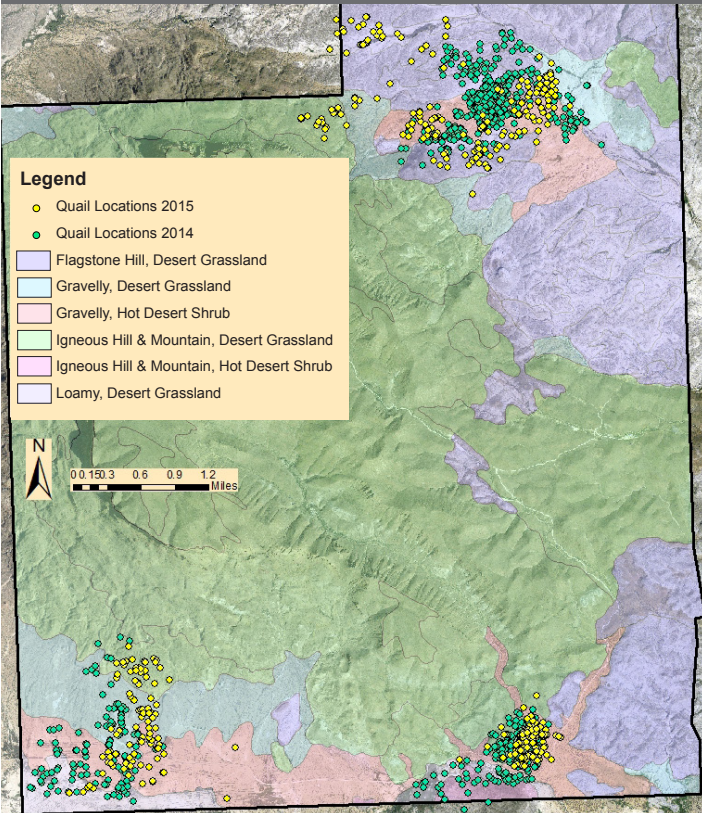
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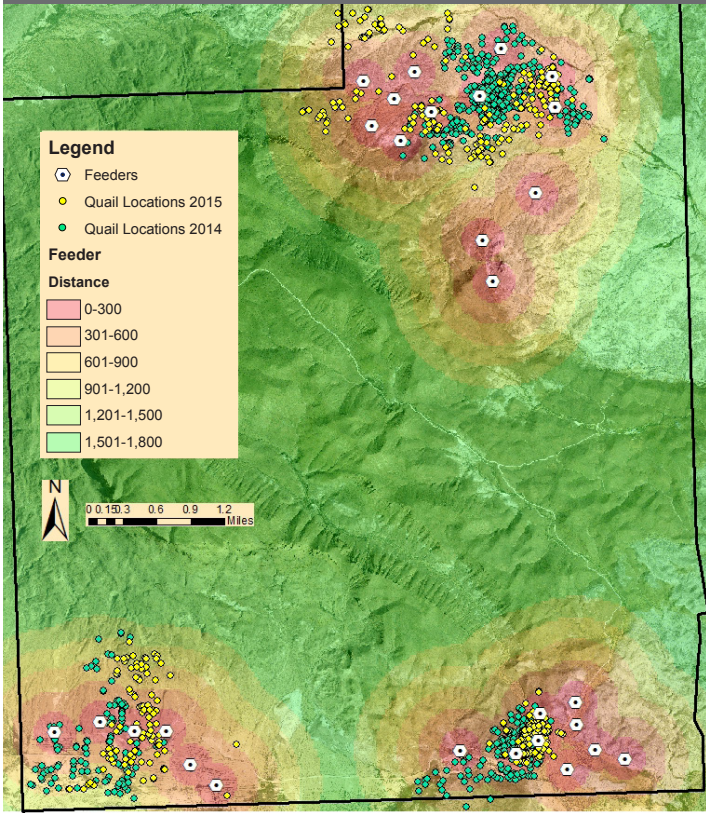
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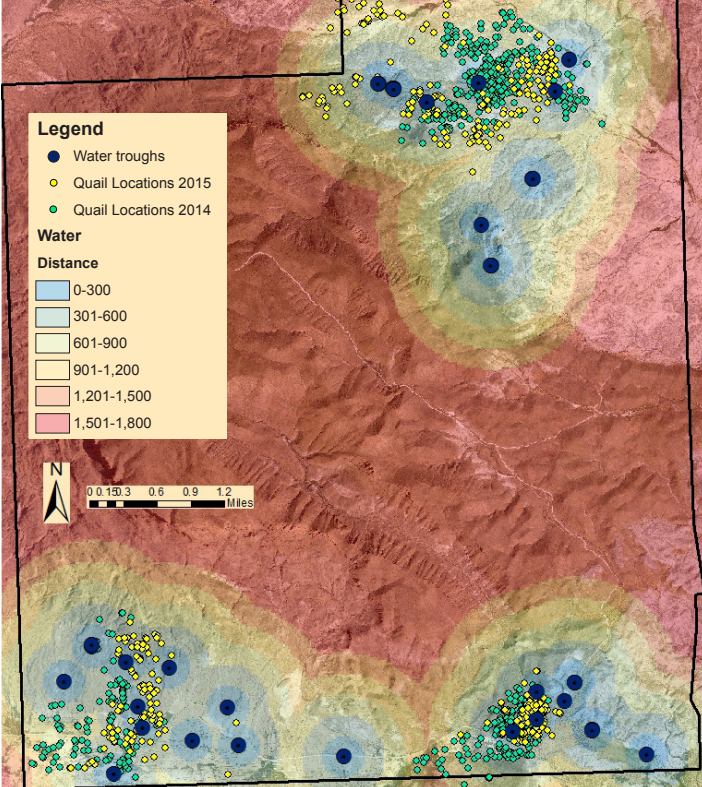
Ecological sites and spatial distribution of Scaled Quail during the summer season of 2014 and 2015.



Distance from feeders and spatial distribution of Scaled Quail during the summer season of 2014 and 2015.



Distance from water troughs and spatial distribution of Scaled Quail during the summer season of 2014 and 2015.



It is known that supplemental feed or water will concentrate quail in an area. As a result, it is used as a management tool for hunting. Regardless of whether or not supplemental feed improves quail survival in the long run, it is another tool in the toolbox available to landowners and can benefit populations when forage is in limited supply. During these time periods when rainfall is limited, providing supplemental feed and water can help to maintain the current population of Scaled Quail so that when rains return, there is more breeding stock on the landscape.

Several studies have documented that up to 70 percent of the quail's water requirements can be satisfied through pre-formed water (water in forage items) and metabolic water (from metabolism). In the arid environment of the Trans-Pecos region, standing water can be a key component influencing quail habitat use. Habitat use was similar across years of the study with 43.55 percent of the locations being concentrated within 300 meters of a supplemental feed or water source. The area 301-600 meters from the feed and water sources accounted for 38.99 percent of the quail locations. Distances 601-900 meters, 901-1,200 meters and 1,201-1,500 meters accounted for 11.32 percent, 5.03 percent and 1.01 percent, respectively.

Vegetation associations were also assessed in terms of ecological sites. The Natural Resource Conservation Service (NRCS) has defined ecological sites as "a distinctive kind of land with specific soil and physical characteristics that differ from other kinds of land in its ability to produce a distinctive kind and amount of vegetation and its ability to respond similarly to management actions and natural disturbances."

For this particular study, 46.38 percent of the Scaled Quail locations

were recorded in the Gravelly-Hot Desert Shrub followed by 21.77 percent in the Flagstone Hill-Desert Grassland, and 13.12 percent in the Igneous Hill and Mountain-Desert Grassland.

More research is needed to determine the preferences among ecological sites within this study area, but it seems this selection has been driven by the amount and diversity of vegetation that can be provided by these areas. Thermoregulation, predator avoidance, nesting cover and food are among the most important characteristics for quail habitat. Of these characteristics, cover seems to drive whether or not a quail will attempt to nest.

In terms of monthly nesting attempts for 2014 during the summer season, the greatest peak was in July having 14 (56 percent) of 25 nests. For 2015, the greatest peak was in May with 15 of 35 nests found during this month. The early peak in nesting could be a result of early monsoonal rains during the spring of 2015, whereas in 2014, this phenomenon occurred later in the summer.

During 2014, the effects of previous year's drought were still evident in many places

across the landscape; therefore, nesting cover was limited and mostly restricted to succulents. As a result, the top three preferred nesting cover types for 2014 were prickly pear (*Opuntia spp.*) with 32 percent of identified nests being found in this vegetation, followed by tobosa grass (*Pleuraphis mutica*) with 24 percent, and tasajillo (*Cylindropuntia leptocaulis*) with 12 percent.

Conversely, 2015 was marked with early precipitation and abundant vegetation growth; therefore, the types of nesting cover utilized by Scaled Quail females were more diverse. During 2015, 54 percent of nest sites were located in grasses such as tobosa grass, purple threeawn (*Aristida purpurea*) and black grama (*Bouteloua eriopoda*). Prickly pear was still utilized and accounted for 22.85 percent of total of nests found; however, we did not find any nests in tasajillo during 2015.

In addition to identifying the predominant nesting cover, we also wanted to determine clutch size for potential population recruitment rates. Reproductive output it is believed to be one of the most important factors driving Scaled Quail population; thus,

data were recorded to predict changes in population dynamics. A total of 60 nests (25 in 2014 and 35 in 2015) were found during the summer of 2014 and 2015. The average clutch size was 11.67 eggs per nest, with four being the least number detected in a nest and 21 eggs the maximum. The average hatching success across both years was 43.04 percent.

Hatching success in 2015 was greater than 2014 with 53.66 percent hatch success versus 32.44 percent in 2014. These figures indicate how crucial the timing of precipitation is to this species. Early rains give a jump start to the nesting period but if rains come late or not at all, Scaled Quail play catch-up which results in low recruitment for that year. Rainfall is particularly important during the nesting season, because it triggers the emergence of insects which are the main source of protein for chicks during the first six weeks of their lives. Although not well-documented, precipitation plays a vital role during the breeding season encouraging Scaled Quail to be segregated in pairs of male and female until a successful reproductive outcome is achieved.

Scaled Quail are a highly regarded upland game bird in Texas, but actions need to be taken to help bolster current populations to ensure future generations are able to witness the spectacle of a large Scaled Quail covey flush. Although it would be nice to be able to control precipitation events each year to help bolster populations, we must rely on creating good habitat that will respond quickly to precipitation events and provide nesting cover that will help facilitate high nest success and potential recruitment into the population.

This wildlife species is not only part of Texas heritage but also a keystone and umbrella species with other species benefiting from quail management practices. By assessing factors influencing survival and recruitment, we gain a better understanding of what might be influencing quail populations. Each research project is an opportunity to identify a factor that is either detrimental or favorable in influencing population trends. Ultimately, research will identify factors responsible for quail population decline over the past decades and offer innovative ways to increase current populations so that Scaled Quail continue to be a valuable resource for generations to come. 🌍



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