



THE

QUAIL-TECH

ALLIANCE



2018 SUMMER UPDATE

Heat Stress and Quail

By Brad Dabbert

I don't have to tell you this, but, it is hot!! The heat wave in Texas has made national news. I wrote about similar conditions during the summer of 2010. But it is beneficial at this point to revisit what is known about the influence of this excessive heat on bobwhites. As you enjoy your air conditioning, you may wonder how quail cope with this heat? What temperatures can they tolerate? Heat stress is something researchers have been concerned about for many years. Several studies have addressed this topic of heat stress on quail survival and reproduction. In the late 60's, researchers from the lab of Professor Robert Robel determined that exposure of adult bobwhites to an ambient temperature of 106°F for 15 hours was lethal. Researchers from the lab of Professor Fred Guthery carried this area of research further in the last decade to conclude that prolonged exposure of quail to temperatures > 102.2°F would result in a plethora of negative consequences for quail populations including reduced egg hatchability, chick survival, and reproductive season length. My work in 1997 revealed that bobwhites can physiologically cope with short-term (4 hour) exposure to 102.2°F by turning on their evaporative cooling system. Bobwhites don't have sweat glands so they evolved a different way to reduce internal temperature. They can rapidly vibrate their throat or gular region (basically panting, very similar to your hunting dogs). This activity, called gular flutter, channels air through their extensive air sac system and open beak to help cool the bird. Bobwhites exposed to 102.2°F for 4 hours in an environmental chamber were able to use gular flutter to cool themselves and avoid body weight loss or any suppression of their immune system. Work in Professor Robel's lab suggested bobwhites need this cooling system at temperatures as low as 95°F. Beyond gular flutter, quail also deal with hot temperatures by trying to avoid them. Researchers from the lab of Professor Fred Guthery determined that bobwhites actually avoid areas in the landscape which hold temperatures > 102.2°F. Thermally unsuitable area sometimes amounted to more than 50% of the available habitat of their study sites. So what types of areas in the landscape lend themselves to cooler temperatures that are beneficial to quail? Figure 1 is a thermal image we took of a mesquite tree and the area surrounding it. The brightest (hottest; 122°F) spots are bare ground and the darkest (coolest; 93.2°F) spots are in the shade beneath the mesquite tree.

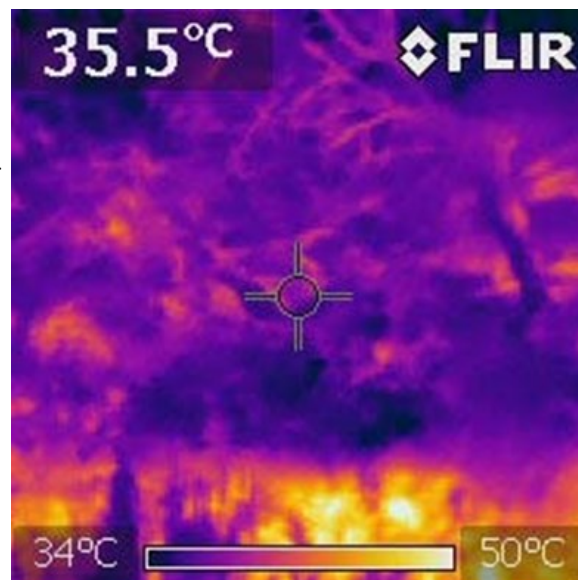


Figure 1. A thermal image of a mesquite tree.



A radiomarked chick in the Hackberry pasture of the 6666 Ranch.



THE

QUAIL-TECH

ALLIANCE



A hen and her brood of 10, 9-day-old chicks is taking refuge under this juniper on July 19, 2018. The air temperature in the sun is 106 °F.



A hen and her brood of 27-day-old chicks is taking refuge under this bush in the center of the picture at 11:10 am on July 19, 2018. Temperature in the shade is 93 °F, but the temperature of bare soil in full sun is 115 °F.

Clearly then, shade from woody cover can provide areas of thermal refugia for quail. We have reported in past bulletins about our chick survival study in which we are radiomarking and tracking bobwhite hens and individual chicks during summer 2018. At the same time, we are monitoring a host of factors such as insect availability and weather conditions. We are examining brood habitat use and the importance of woody cover as a refuge from the heat is very evident. The pictures in this bulletin show thermal cover areas where hens and their broods spend many hours of the day. Lotebush, mesquite, and juniper are all being used to escape this extreme heat. We look forward to reporting more detailed habitat use and survival data to you as the study concludes during September 2018. We wish to thank the 6666 Ranch, The Burnett Foundation, and the Cross Timbers and Park Cities Chapters of the Quail Coalition who are funding this research.



THE

QUAIL-TECH

ALLIANCE

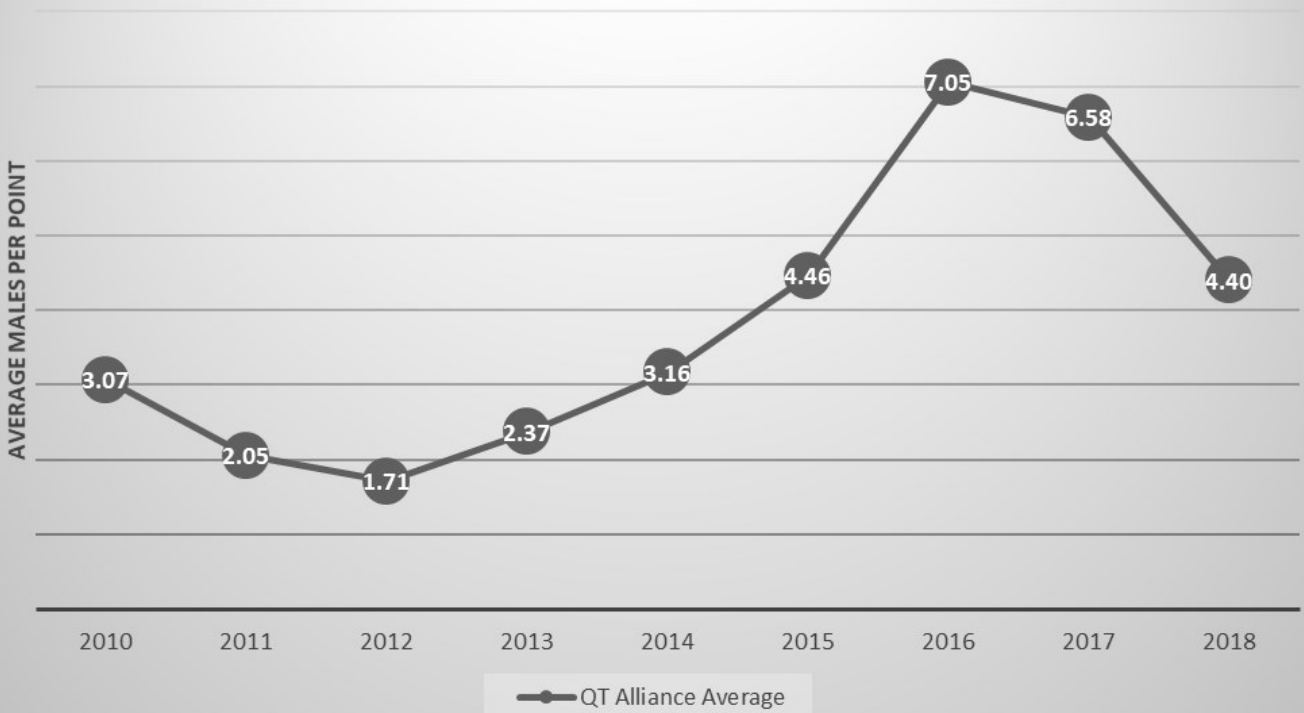


2018 Spring Whistle Count Report

Here are the results of The Quail – Tech Alliance 2018 spring whistle count report. We are thankful for the generous support from our Anchor Ranches and the hard work of our biologists and technicians, whom without we could not achieve this wide scope of data for quail populations in the Rolling Plains of Texas. We collect and provide this information so landowners, can make management decisions that benefit their operations and bobwhite populations, and that as researchers, we can identify important trends.

What Does This Data Represent?

QT Alliance Spring Call Count Average 2010-2018



Every Quail – Tech anchor ranch has a number of listening points corresponding with the ranch's size. Starting at sunrise until 10 AM we spend 6 minutes at each point listening for the "bobwhite" call made by the male northern bobwhite. By counting the average number of males per point we can create an index of abundance which allows us to track population trends over time.



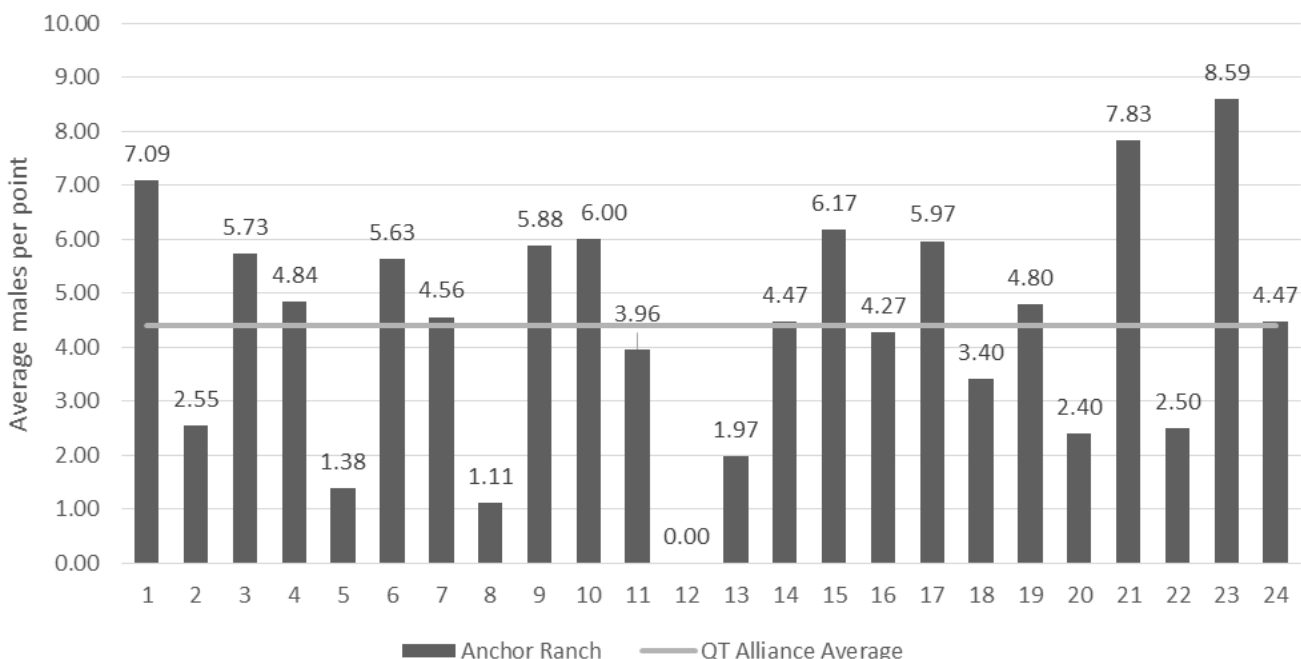
THE

QUAIL-TECH

ALLIANCE



2018 QUAIL - TECH ALLIANCE ANCHOR RANCH SPRING CALL COUNT



How Can I Use This Information?

It was once thought male bobwhites who had found a mate did not call, but subsequent research has shown that even mated males may call bobwhite (and in very rare cases even female bobwhites may make this call). Also, differences in the hearing abilities of each observer, changes in weather, and time of day can affect the number of calls heard on each ranch. For these reasons, spring whistle counts are only an index and not an absolute measure of abundance. Think of these data as an estimate of breeding potential. Despite these caveats, this data provides insight into how geographic areas compare across the Quail – Tech Alliance, how populations have fared over time, and the maps may indicate areas of management successes (or challenges).

2018 Summary

The 2018 Quail – Tech Alliance spring whistle count average is 4.40 males per point, a decrease of 2.18 from 2017. This marks the second consecutive year with a decrease; however, 2018 is a much steeper decrease than the 0.47 seen in 2017. As you may recall, we harkened the decline in 2017, which included decreased covey counts and age ratios skewed heavily towards adult bobwhites across the region. When there are more adults than juveniles in the fall population this means there was poor nest success and chick survival during the reproductive season as mentioned in the previous bulletin. This creates an older population with fewer juveniles to replace the adult birds that fall prey to predators. These reduced populations were met with harsh environmental conditions that covered much of the Rolling Plains over winter and into the spring, including some record heat and dry spells. These conditions do not favor successful nests or chick survival as hens have been documented to cease egg laying during extreme hot and dry periods.

(continued)



THE

QUAIL-TECH

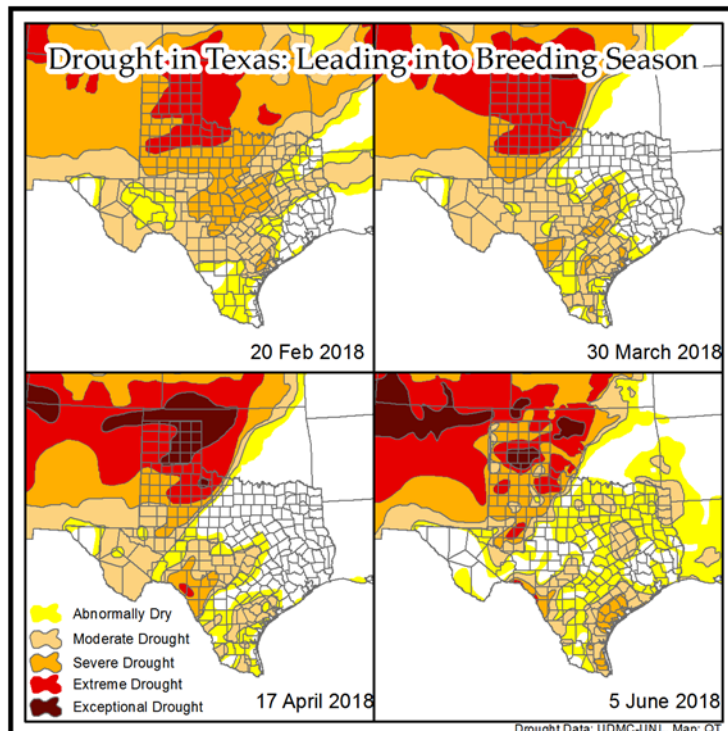
ALLIANCE



Rains have slowly been kind to a few areas since spring whistle counts began May 15th. Keep this in mind, early in the counts some of the ranches surveyed had still not received any rain, but have since received rainfall that starts plant growth on the ranch which stimulates birds to start calling and reproduce. That said, the increases seem subtle and are not promising for a blanket bumper crop year for the region. For the ranches that have saved nesting cover, received timely rains, and have insects for chicks to eat, maybe the fall numbers will not be as dire.

There is one other caveat with this data and the drought, and that's fire. There were a few ranches which have been in exceptional drought since last fall and also experienced wildfires and prescribed burns during the spring. These ranches remarkably include the few that had small increases in their spring count averages. For the most part, these are as also include deep sandy soils which ecologically can act as "wetter" sites, meaning the plants are capable of getting more water from the soil, thus having higher vegetative production and faster recovery. Whether wild or prescribed, in the areas that received fire, the bobwhites seem to have fared well in those areas, and the habitat is recovering from the natural disturbance after receiving rainfall.

Once again, thank you to our Anchor Ranches, donors, and our team of biologists and technicians for their support, work and dedication to Quail – Tech.



Drought data for Texas: Leading into breeding season



THE

QUAIL-TECH

ALLIANCE



Wildfire landscape in recovery.



Wildfire landscape in recovery.



Deep sandy soil site similar to those that had burned.