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Northern Bobwhite Hunting Dynamics & Modern Technology

by D. Abraham Woodard, Leonard A. Brennan, Tyler A. Campbell, Landon Schofield, Fidel Hernández, Humberto L. Perotto-Baldivieso, and Neal Wilkins

Technological advances are improving the effectiveness and efficiency of our lives. From doorbell cameras to "smart" appliances to self-parking cars, our everyday processes and functions are being impacted by technology at a remarkable pace and scale. Most hunters go to the field to unplug and escape the bombardment of technology, but can technological applications be helpful in the time-honored traditions of quail hunting? We believe they can.

Quail hunting is a fundamental component of northern bobwhite conservation and the economies of rural areas throughout the United States (Figure 1). In South Texas, annual lease revenues for bobwhite hunting can yield up to \$20 per acre, generate more than \$75 million in income, and create over 1,600 jobs (Dodd et al. 2013). The reason it generates so much income—bobwhite hunting in South Texas is arguably the best quail hunting in the world.

With that being said, it is our responsibility to manage our bobwhite populations sustainably, which includes our harvest practices. The recommended harvest rate for bobwhites in South Texas is 20% of the fall population annually, including crippling losses (Brennan et al. 2014). However, previous research has found that harvest timing, frequency, and distribution can also impact bobwhites (Radomski and Guthery 2000, Brooke et al. 2017, McGrath et al. 2018). For instance, as hunting pressure increases, bobwhites begin displaying avoidance behavior such as early or distant flushes, non-flushes or running, and complete avoidance of hunted areas. These behaviors, combined with reductions in local populations, have both economic and biological consequences. Therefore, managing a bobwhite harvest includes distributing hunting pressure across time and space, or in other words, across long hunting seasons and the pastures available to hunt.





*Figure 1.
Bobwhite hunting party
on Buena Vista Ranch, Jim
Hogg County, Texas. Hunting
wild bobwhites adds over \$75
million to the economy of South
Texas — advances in tech-
nology can help managers
sustain this important
resource.*

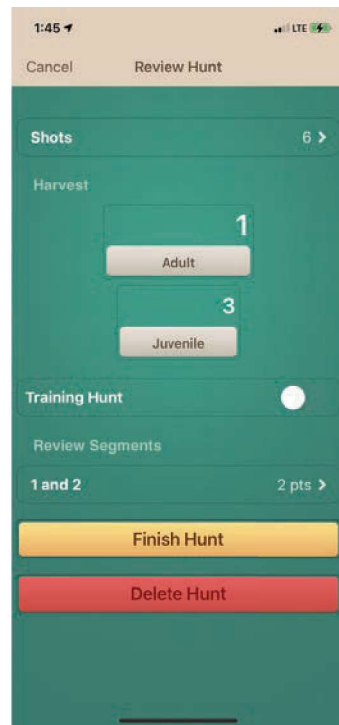
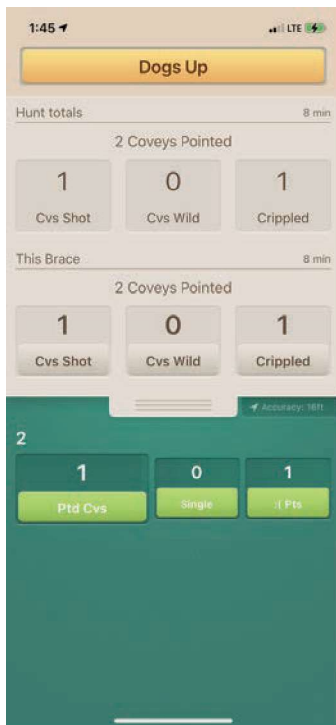
To assist managers with the strategic planning of harvest, the Caesar Kleberg Wildlife Research Institute and the East Foundation initiated a research project to analyze the spatial and temporal dynamics of bobwhite hunts in South Texas. The study took place during 3 bobwhite hunting seasons (2018–2019, 2019–2020, and 2020–2021) on 15,000 acres of East Foundation property in Jim Hogg County, Texas. The East Foundation is a nonprofit organization established in 2007 from the estate of Robert C. East that promotes the advancement of land stewardship through ranching, science, and education.

To analyze bobwhite hunting dynamics, we recorded detailed hunting logs and GPS tracks for each dog and hunting vehicle. We used the information collected to study "where" hunting occurred and "when" it occurred throughout each hunting season. In total, we documented 211 bobwhite hunts consisting of more than 1,805 covey encounters, 8,220 gunshots, 153 bird dogs, and over 1.9 million GPS locations.

We documented hunting activity on 77% of the total area available to hunt, with many areas hunted on multiple occasions within and between years (Figure 2). We found that bobwhite hunting parties effectively hunted 60 acres per hour, ranging from a low of 31 acres per hour to a high of 87 acres per hour. On average, hunters encountered 2.8 coveys per hour in the morning and 2.4 coveys per hour in the afternoon. Hunters retrieved 1.0 bobwhite per covey found and recovered a bobwhite for every 5.1 shots.

Hunting effort (i.e., total hunts and hours hunted) and efficiency (i.e., coveys per hour and harvest per covey) were highest during the middle portion of the hunting season (mid-December to late-January) and lowest during the early season (November to mid-December). In fact, we found that hunters found 13% fewer coveys per hour and harvested 31% fewer quail per covey during the early period. We also found that the spatial distribution of hunting pressure was negatively influenced by brush canopy cover and distance to the nearest road. Specifically, for every 5% increase in brush cover and 10 meter (i.e., 10.9 yards) increase in distance from a road, there was a 12% decrease in total hunting pressure.

As the study progressed, it was clear that landowners, hunters, and biologists who wished to implement our findings would need a simplified manner to record hunting dynamics and spatial hunting distributions. Therefore, identifying such a program became a secondary objective. Although many options are available, we found the program CoveyIQ (CoveyIQ LLC, Charlotte, NC; www.coveyiq.com) was the most efficient. CoveyIQ was



designed by quail hunting enthusiasts in North Carolina and incorporates many of the bobwhite hunting variables we documented (e.g., dog details, hunting times, covey locations, shots fires, bobwhites harvest, bobwhites crippled). The program involves a mobile application for collecting the field data and a secure website for reviewing and downloading the final hunting dynamics.

We assessed the CoveyIQ program by recording 31 hunts on the mobile hunting app during the 2020–2021 hunting season. Seven different observers recorded the hunts using various Apple products (Apple Inc., Cupertino, California, USA). We found that the mobile app has a straightforward design (Figure 3),

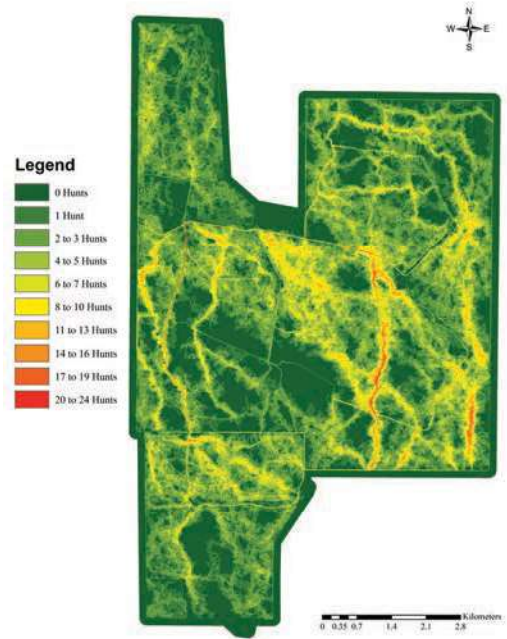
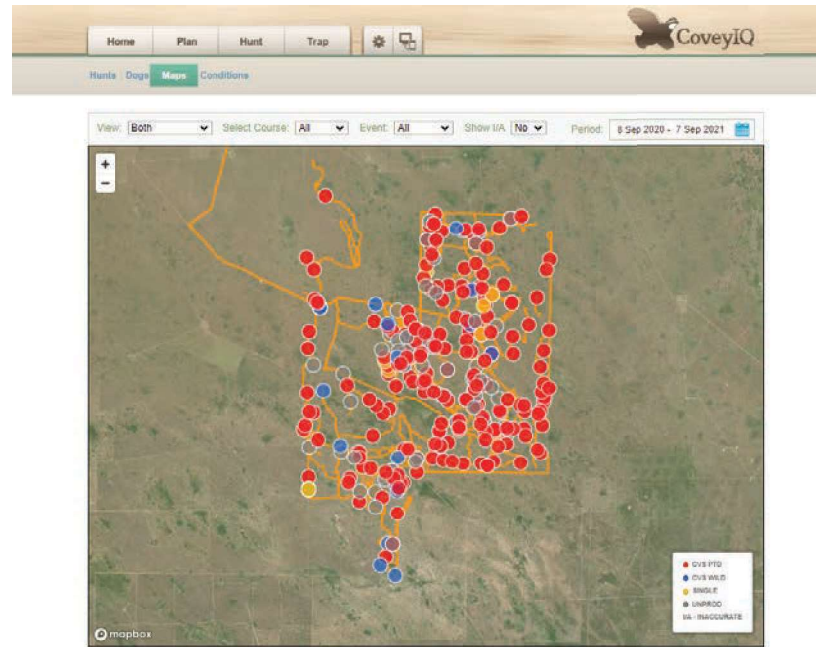


Figure 2. Total hunting pressure distribution for 211 quail hunts during 2018–2019, 2019–2020, and 2020–2021 bobwhite hunting seasons on Buena Vista Ranch, Jim Hogg County, Texas.

Figure 3. Covey IQ mobile hunting application hunt screen (CoveyIQ LLC, Charlotte, NC).

Figure 4. Hunting distributions and bobwhite covey encounter location maps from CoveyIQ website as recorded from mobile hunting application (www.coveyiq.com).



allowing for simplistic data entry in "real-time" that would not interfere with the hunts themselves. The app records the spatial position of the hunting path and each covey encounter (Figure 4) while simultaneously gathering hunting times and environmental conditions (e.g., temperature, humidity, wind speed). The application did not require cellphone service to record hunts, and the application would automatically upload to the CoveyIQ website after completing the hunt. The website was also user-friendly, with various options for viewing and organizing data (Figure 5). For instance, hunting dynamics can be sorted and organized by time (e.g., day, week, month), individual dog or hunting party performance (e.g., covey per hour, harvest per covey), or map layers of interest (e.g., hunting path, coveys pointed, unproductive points). In summary, the CoveyIQ program allows for recording fundamental bobwhite hunting dynamics within a simplified framework that provides data organization and summary analysis without tedious data processing.

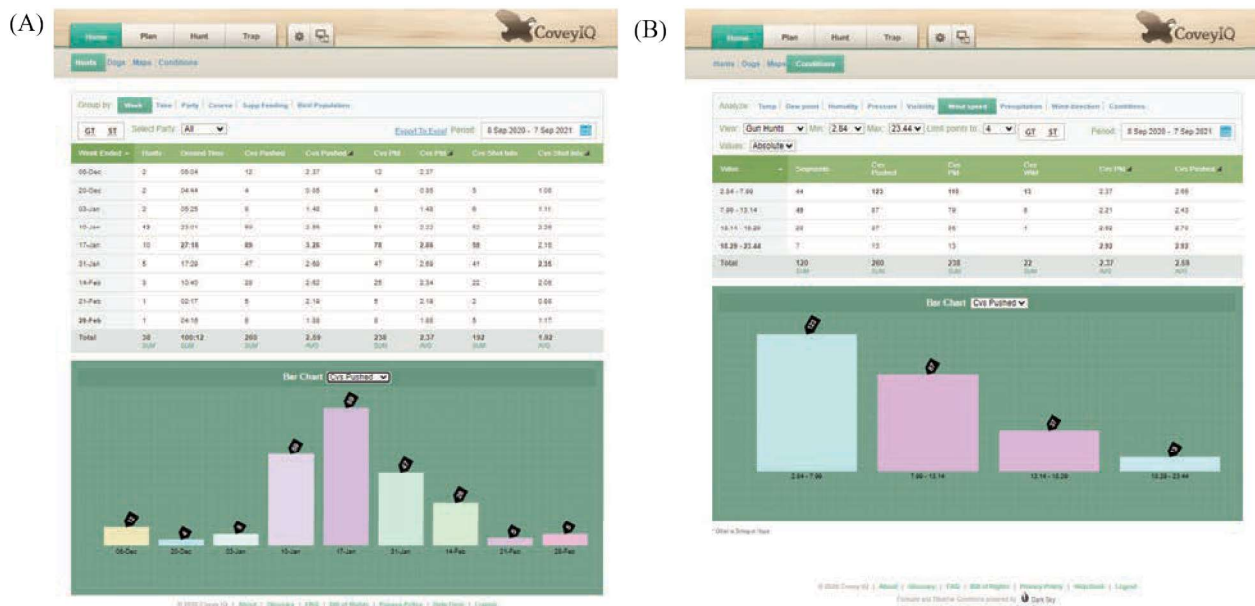


Figure 5. CoveyIQ hunting reports for windspeed (A) and coveys encountered per week (B) obtained from CoveyIQ website (www.coveyiq.com), recorded during the 2020–2021 hunting season on East Foundation's Buena Vista Ranch in Jim Hogg County, Texas.

There are very few activities or products in our lives that have not been influenced by modern technology. Despite the deep history and traditions of northern bobwhite hunting, there is practical use and need for incorporating modern technology. We've also found great enthusiasm from hunters, who now have records of where they have hunted and found coveys along with seasonal hunting dynamics. All of which makes for interesting discussions around the evening campfires with fellow hunters and quail enthusiasts. ↓