

# QUAIL NEWS

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No. 8

March 2001

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The newsletter of game bird research and management from the Bollenbach Chair, Oklahoma State University.

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## WINTER

The winter of 2000—2001 brought record cold to some parts of the country, ice storms that wreaked havoc in the woods of eastern Oklahoma and a great deal of discussion on how quail populations were faring.

By mid-December, some outfitters in the Rolling Plains of north Texas were reporting under weight birds and birds that flew weakly.

Snow stayed on the ground for a month on Frank Robson's ranch near Vinita, OK. He stopped hunting and started feeding.

Biologists monitoring radiotagged bobwhites in Missouri found birds frozen in their tracks (the exact cause of death awaits further analysis).

The quail research team at Oklahoma State University had a unique opportunity to assess winter severity from a bobwhite's perspective. We have a permanent weather station on the Mesa Vista Ranch in Roberts County of the Texas Panhandle. The station records air temperature at 15-minute intervals, 24 hours a day, 7 days a week. From these air temperatures, we can estimate the amount of food required by a bobwhite experiencing the temperatures.

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Professor Robert J. Robel, Kansas State University, developed precise methods of estimating the energy (food) needs of bobwhites at different air temperatures. We used his equations in estimating the energy demand at Mesa Vista.

A ballpark estimate of daily energy demand may be derived as follows:

- Divide air temperature in Fahrenheit by two.
- Subtract this number from 65.

The resulting number is the estimated number of kilocalories (kcal) that a bobwhite needs to survive for 1 day (a kcal in animal nutrition is the same as a calorie in human nutrition).

For example, if air temperature is 40 F, a bobwhite needs about 45 kcal of energy in a day.

Professor Robel also has determined that a bobwhite needs the energy equivalent of 0.032 ounces of milo for every 4 kcal of energy it uses. Thus, it is possible to convert energy demand in kcal into a milo equivalent in ounces.

Here is the estimated daily energy demand for bobwhites on Mesa Vista Ranch during December 2000 through mid-January 2001:

<u>Week ending</u>	<u>Ounces milo</u>
12/01/2000	0.34
12/08/2000	0.37
12/15/2000	0.29
12/22/2000	0.38
12/29/2000	0.43
01/05/2001	0.41
01/12/2001	0.34
01/19/2001	0.35

During the 8-week period ending on 19 January, a bobwhite would have needed the energy equivalent of about 1.43 pounds of milo.

The highest energy demand (0.41—0.43 ounces of milo per day) occurred during the weeks ending on 29 December and 5 January. Temperatures ranged between 6 and 56 F and averaged 35 F during this period.

Bobwhites, according to Robel's research, can process at most 0.55 ounce of food (dry weight) in a day. Storage capacity in the craw and rates of food passage set this limit.

The daily milo requirement for the week ending 29 December (0.43 ounce) approached this limit. This means that under the temperature regime observed, bobwhites subsisting on lower quality food probably lost weight.

Ragweed seeds are an excellent energy source—slightly better than milo—but there was reportedly a failure in ragweed production in western Oklahoma and north Texas last year.

When bobwhites cannot obtain sufficient energy from foods, they burn body fats and proteins. In north Texas and western Oklahoma, these birds typically carry about 126 kcal of emergency fuel. Under temperatures like that experienced during the week ending 29 December, fasting (*see p. 3*)

QUAIL NEWS is published twice yearly by the Department of Forestry, Division of Agriculture and Natural Resources, Oklahoma State University, Stillwater, OK 74078. Subscribe with a donation to OSU FOUNDATION/GAME BIRD RESEARCH FUND. Direct inquiries to Fred S. Guthery at the above address (phone 405/744-9431, e-mail forfsg@okstate.edu). The Bollenbach Chair is part of the Oklahoma Agricultural Experiment Station.

### *Editorial: some thoughts on usable space*

→With a little brush, a fair amount of grass, and a lot of countryside with brush and grass, bobwhite populations pretty well take care of themselves. Habitat management applied to such countryside is done to keep the countryside in its current condition, for insurance against weather emergencies and for the pleasure of doing habitat management. This is the general outlook under the **usable space hypothesis**, which says habitat quantity should be the goal of habitat management.

Recently I have been seeing unusable definitions of usable space. Some people take usable space to be most any form of permanent cover. Not so from a colin perspective. Usable space is defined as habitat structure compatible with the behavioral, physical and physiological adaptations of bobwhites. They've got to be able to use the food and cover in it, walk through and fly over it, and ride out cold spells and heat waves in it. If it doesn't meet these conditions, it's not usable space, regardless of whether it's permanent.

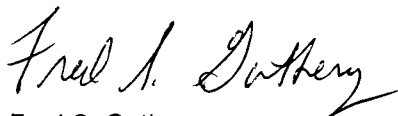
→Last fall I spoke in Ada, OK, at a seminar organized by **Harland Stonecipher**, Chairman of the Oklahoma Wildlife Commission. One topic of discussion was the amount of usable space required by a population of bobwhites if we want to insure that our great great grandchildren have populations to hunt or otherwise enjoy. I left the symposium feeling that hope might have been wrung out of the small landowner.

**Markus Peterson** (Texas A&M University), **Ronnie George** (Texas Parks and Wildlife Department) and I have addressed the viability of bobwhite populations with computer simulations firmly grounded in applied quail biology. These simulations indicate that a population of 800 birds or more is very, very secure and quite likely to be around in 100 years. The chances of persistence decline as population size declines. I hasten to point out that while our work was mathematically sophisticated, it could reasonably be called an educated guess.

Regardless, secure populations need goodly amounts of usable space. Any particular forty, eighty, quarter section, half section or section might harbor zombie populations (destined to go extinct) or they might be graveyard habitat (the zombie populations already have gone extinct). To prevent local extinctions, small landowners must work cooperatively to provide more usable space than any one might be able to provide individually.

→Some recent research out of North Carolina State University is encouraging for small landowners. If usable space in the form of permanent strip cover such as warm-season grasses is added to agricultural areas, the quail population response might exceed expectations based on the amount of usable space added. For example, 50 acres of herbaceous cover added next to existing woody cover might create 100 acres of usable space. These results show meaningful boosts in quail abundance with minimal additions of usable space.

But the strip cover must be added in the correct habitat context or it will be largely neutral. The correct context means that herbaceous cover is added next to existing strips of woody cover, such as might occur along drainages.



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Bollenbach Chair in Wildlife Ecology

bobwhites had enough energy to survive for about 3 days.

The calculations here are based on the assumption that bobwhites lived under temperatures identical to those measured at the weather station. Moreover, the calculations do not take into account wind chill factors.

Winter coveys probably find coverts warmer than the ambient temperature to stay in between morning and evening feeding periods. The roosting circle confers thermal benefits on cold nights. These behaviors reduce energy loss and food demand. So the milo demands estimated above probably represent a worst-case scenario.

The original research on bobwhite energetics appeared in the following paper: R. M. Case and R. J. Robel. 1974. Bioenergetics of the bobwhite. *Journal of Wildlife Management* 38:638—652. This paper is one of the major contributions to our understanding of bobwhite ecology.

For a technical summary of the Case and Robel findings, as well as additional information on bobwhite energetics, write Fred S. Guthery, Department of Forestry, 008C Ag Hall, Oklahoma State University, Stillwater, OK 74078. Ask for a reprint of “Energy-based carrying capacity for quails.”

## THE TALES IN WINGS

The wings of quail obtained during harvest tell many stories about the breeding season just past and the dynamics of a local population.

Bobwhites hatched in the immediate past breeding can be separated into young-of-the-years (YOYs) and adults that are more than a year old. White tipping on the primary coverts (the feathers that cover the main flight feathers at the front of the wing) indicate a YOY. Lack of white tipping on these feathers indicates an adult.

Because YOYs sequentially molt their main flight feathers as they age, it is possible to estimate the date of hatch for birds less than about 150 days old.

The OSU research crew analyzed 561 wings of birds harvested on **Boone Pickens**’ Mesa Vista Ranch during November—January 2000—2001. These data were supplemented with information from bobwhites trapped for leg-banding and radiotagging.

Here are some of the stories the wings told about production in the spring and summer of 2000:

- The earliest hatch was in early May, the latest in early October.
- The hatching season spanned about 5 months.
- There seemed to be a notable hatch in the period mid-July—mid-August based on September trapping, but this hatch disappeared from subsequent trap samples. Its fate is not known.
- Analysis of wings from the harvest indicated the hatch was about 99% complete by early August.
- The age ratio (number of YOYs in the harvest divided by the number of adults) was about 2.4.
- The harvest consisted of 7% blue quail and 93% bobwhites.

When data on ages of birds in the harvest are maintained over a number of years, the wings tell more stories. The average annual percentage of YOYs provides an estimate of the average annual mortality rate. Likewise, the average percentage of adults estimates the average annual survival rate.

**Scott Sudkamp**, Texas Parks and Wildlife Department, has collected data on the age ratios of bobwhites at the Matador Wildlife Management Area in the Texas Panhandle. Twenty-two years of data indicate an average annual mortality rate of 76.1% (the percentage of YOYs) and an average annual survival rate of 23.9% (the percentage of adults). These numbers translate to an annual age ratio of 3.2 juveniles/adult.

The highest age ratio on record at the Matador Area (6.9 juveniles/adult) occurred during the hunting season of 1961—62. The lowest (0.9 juveniles/adult) occurred in 1998—99, after the brutally hot summer of 1998.

## QUAIL SYMPOSIUM SET FOR AUGUST 2001

“Success on the Land” is the theme for the second Bollenbach Quail Symposium to be held in Kingfisher, OK, on 2—3 August 2001. The program will focus on actual management activities used to foster high populations of bobwhites and other wildlife.

The first day of the symposium will involve a field tour of wildlife management activities in the vicinity of Kingfisher.

The second day will involve presentations at the Kingfisher County Fair Grounds. Scheduled speakers include

- **Mick Hellickson**, wildlife biologist for South Texas’s fabled King Ranch. Hellickson will address the management of game animals and hunting operations on King Ranch.
- **Bill Gwinn**, lease manager for Sportsmen’s Country Club out of Oklahoma City. Gwinn will speak on how he assesses the value of hunting leases on Oklahoma farms and ranches, and the problems he encounters in managing leases.
- **Hal Werner and Jacky Hall**, owners of Shinnery Springs Ranch in Ellis County, OK. They will share experiences in rehabilitating ranch land to provide for diverse wildlife populations.
- **Sid Clarke III**, owner of Lutine Farms, Asher, OK. Clarke will address the successes and frustrations he has encountered in bobwhite management and some of the ideas he has developed.
- **Russ Horton**, Oklahoma Department of Wildlife Conservation. Horton will review the habitat management that took **Paul Odum’s** ranch from a cedar thicket to a productive area for deer, quail and wild turkeys. Odum received a Land Stewardship Award from the Oklahoma Department of Wildlife Conservation.

- **Terry Bidwell**, State Range Extension Specialist, Oklahoma State University. An expert in prescribed burning methods and fire ecology, Bidwell will speak on using prescribed fire to rehabilitate wildlife habitat, especially that infested with eastern red cedar.

More details will be appearing on the symposium as plans are finalized.

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*Quail Questions.....*

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*I am interested in finding a book or other information, which will help me to identify plants that provide quail with food in the Rolling Plains section of Texas.—Clark W. Taylor, Baton Rouge, LA.*

There is a delightful pamphlet called “Quail Management Handbook for West Texas Rolling Plains” by A. S. Jackson. It has pictures and descriptions of several Rolling Plains food plants. It was published by the Texas Parks and Wildlife Department in 1969.

**BITS AND PIECES.....**

- **Dale Rollins**, well-known quail conservationist with Texas A&M University, has surveyed members of Quail Unlimited in Texas to assess their hunting expenditures. Quoth Rollins: “While the figures likely aren’t generalizable to Texas quail hunters in general, the average TQU member spent just over \$10,000 in

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pursuit of quail in ’99, including \$2,900 in lease fees, \$2,300 in dog expenses, \$2,112 for on-site vehicles, \$645 for feed/feeders/food plots.” The average QU member hunted about 16 days and brought 50 birds to bag. **Rollins** points out the data are preliminary. The survey is being done to assess the value of hunter expenditures to rural economies, thereby to help justify a Quail Decline Initiative under consideration by politicians in Texas.

- There is a rumor out that bobwhites are declining on southeastern plantations, despite intensive habitat management on these plantations. Not so according to **Leonard A. Brennan** and associates, Tall Timbers Research Station, Tallahassee, FL. Analyses of harvest records from 5 plantations revealed populations with no downward trend over periods ranging from 14 to 80 years. Statewide populations in Georgia and Florida, on the contrary, have been declining since the 1960s. **Brennan** observed that high-quality habitat management on these 5 plantations has resulted in long-term, high quality hunting. He also observed that bobwhite populations have done well despite the presence of red imported fire ants.
- The Georgia Department of Natural Resources has started a program called the **Bobwhite Quail Initiative**. Its purpose is to halt the decline (70% since the 1960s) in the statewide quail population. The

*We do not have the quail that we once had in the State principally because of changing patterns of land use. The landscape has changed so radically in places that extensive tracts of land have become completely unproductive of quail.—Robert W. Murray and O. E. Frye, Jr., *The Bobwhite Quail and its Management in Florida*, 1957.*

decline is costing the state \$43 million a year in hunting and associated expenditures. The Georgia DNR provides management advice and planning and pays incentives to private landowners for habitat developments such as permanent field borders, prescribed burning and establishment of hedgerows. Thanks to **Sid Clarke III**, Shawnee, OK, for bringing the Georgia initiative to my attention.

- To see the dramatic effects of habitat management with timber harvest and prescribed burning, visit the Pushmataha Wildlife Management Area between Clayton and Antlers, OK. A Forest Habitat Research Demonstration Area was started there in 1983. **Ron Masters**, Department of Forestry, Oklahoma State University, and **Jack Waymire**, Oklahoma Department of Wildlife Conservation, have collaborated in management and

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evaluation of the project. Some of the burn-harvest treatments show how to turn unsuitable forest types into excellent bobwhite habitat.

- Proceedings of the first (\$10), second (\$10), third (\$15), and fourth (\$20) national quail symposiums are available from the Tall Timbers Research Station, 13093 Henry Beadel Drive, Tallahassee, Florida 32312. The proceedings are collections of technical papers. Other information available at Tall Timbers can be viewed on the organization's website (<http://www.talltimbers.org>).
- *On Bobwhites* (Texas A&M University Press, 2000) by **Fred S. Guthery** is available from the Department of Forestry, 008C Ag Hall, Oklahoma State University, Stillwater 74078. Cost is \$25.00, including shipping and handling. Please make checks payable to the Department of Forestry and advise whether you would like a signed copy. *Mostly, Guthery ... succeeds brilliantly in reducing often confusing and complicated scientific concepts to easily understood prose.—S. W. Harris, Choice*, December 2000. *On Bobwhites is easy to read even though [Guthery] includes detailed scientific research.—Gary Clark, Houston Chronicle*, March 2000.