

# QUAIL NEWS

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

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## GREEN VARMINTS

As we rue the decline of bobwhites in some parts of America, and cast aspersions on predators, big agriculture and sundry other scoundrels, green varmints are quietly and relentlessly gobbling up space that could otherwise house coveys.

Eastern redcedar is a green varmint of some moment in central Oklahoma.

"Examples of wildlife that decline commensurate with increased invasion of [junipers such as eastern redcedar] include Rio Grand turkey, mourning dove, bobwhite quail, greater and lesser prairie chicken and white-tailed deer," report Terry Bidwell and associates, Oklahoma State University. "In the case of wild turkey, juniper encroachment in riparian areas that were turkey roosts [has] been implicated in the abandonment of historical roost sites."

Bidwell and associates estimate that from 1985 to 1994, eastern redcedar and Ashe juniper claimed 284,000 acres of Oklahoma each year. Under strong assumptions, this could represent the loss of up to 5,680 coveys per year.

"The invasion of juniper into native plant communities shades out forage plants for wildlife and livestock and reduces stocking rate and carrying capacity. Forage production sharply declines as eastern redcedar trees increase in canopy cover

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and density....”

Another green varmint that is depredating the countryside is sericea lespedeza. This plant is a quail problem in portions of central and eastern Oklahoma.

Introduced from Japan for conservation purposes, sericea is adapted to a variety of soils. The plant has high levels of tannin, rendering it largely unpalatable to livestock. Hence, grazing may foster sericea by placing palatable forages under a competitive handicap.

Sericea can turn pastures into dense monocultures that provide cover but no other habitat needs of bobwhites.

Although eastern redcedar and Ashe juniper are native to America, green varmints tend to be introduced plants. Sericea, Johnsongrass, Old World bluestems, bermuda grass and buffel grass are examples.

“We are facing a dilemma with predictable consequences,” reports Bidwell on the juniper invasion. “Are we going to be good stewards of the land and maintain native plant communities or not...? One option, doing nothing, has major negative environmental consequences.

“Our best option is to use a combination of natural ecological processes (i.e., fire) and other human

designed (mechanical) management practices to restore prairie, shrubland, and forest ecosystems.” Bidwell points out that when juniper communities cross a threshold of size and density, they become extremely difficult to manage.

For further information, obtain a copy of *Invasion of Oklahoma Rangelands and Forests by Eastern Redcedar and Ashe Juniper* by Terry Bidwell, David M. Engle, Mark E. Mosely and Ronald E. Masters. Bidwell’s mailing address is Department of Plant and Soil Sciences, Division of Agriculture and Natural Resources, Oklahoma State University, Stillwater, OK 74078.

*Ecology and Management of Sericea Lespedeza* by Lance T. Vermeire, Terry Bidwell and Jim Stritzke is available at the same address.

## MESA VISTA PROJECT UP AND RUNNING

Boone Pickens’ Mesa Vista Ranch in Roberts County of the Texas Panhandle carries strong populations of bobwhites year in and year out. In collaboration with Pickens, OSU researchers have embarked on a 5-year study to determine why quail populations there remain at high levels, somewhat independent of variation in annual weather patterns.

The studies also will analyze in some detail how the thermal environment (heat, cold) influence the field behavior and reproductive success of bobwhites.

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### *Editorial: As quail decline, contradictions increase*

When you hear about long-term trends in bobwhite and other quail populations in Oklahoma, Texas and elsewhere, you will hear some learned biologists reporting 20—30-year declines and others reporting stable populations for the same regions. What's going on?

Biologists analyze long-term trends with 3 main sources of data: Breeding Bird Surveys administered by the U.S. Fish and Wildlife Service, Christmas Bird counts conducted by members of the National Audubon Society and so-called roadside counts done by biologists with the Texas Parks and Wildlife Department and the Oklahoma Department of Wildlife Conservation. In some cases, analyses of these data lead to similar conclusions. In other cases, they do not.

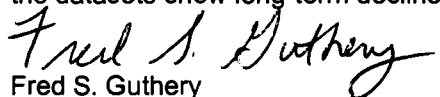
All of the sources of trend data have problems. Breeding Bird Surveys, for example, depend on **hearing** as well as **seeing** bobwhites. On any given survey route, we know that counts generally increase if a young counter replaces an old counter. Young counters have better hearing so they hear more birds. So declines could, theoretically, be associated with the aging of biologists rather than the behavior of quail populations, and we could, theoretically, reverse perceived declines by deploying younger biologists to do counts. The age factor is merely an example and is not meant to be taken as an explanation.

Christmas Bird Counts are done by a potpourri of volunteers; the make-up and size of count crews change each year.

The most valid trend data probably come from roadside counts done by state biologists with the primary if not sole purpose of counting quail. However, these counts are not without biases. Recent and current weather patterns can make it appear there are more or fewer quail than there really are in comparison with other times.

The bottom line is that different samples yield different information and contradictions arise.

Whereas Breeding Bird Surveys, Christmas Bird Counts and roadside counts each provide important information about trends in American bird populations, each is associated with a good deal of uncertainty. In fact, since trend information derived from the counts conflicts in some parts of the country, we may conclude without fear of, well, contradiction, that at least one of the datasets is generating baloney in some regions. However, in other regions all of the datasets show long-term declines in quail abundance.

  
Fred S. Guthery  
Bollenbach Chair in Wildlife Ecology

Evidence is mounting that heat loads are a key feature in quail reproduction. A unique feature of the Mesa Vista research is that quail will carry radiotags that simultaneously reveal location and temperature of a bobwhite.

Steven Smith, an undergraduate majoring in wildlife ecology at OSU,

conducted call-counts on the Mesa Vista Ranch last summer. He heard up to 17 calling males per listening post, which extrapolates to a density exceeding a bird per acre in autumn if production was normal. Calling activity remained robust through mid-July, then began collapsing and essentially ended by mid-August.

## SMALL PLOT STUDY REVEALS THERMAL HAZARDS OF OVERGRAZING

From a bobwhite's perspective, grazing that scalps the soil of vegetation creates hell on earth.

These results arose from small-plot experiments this past summer on the Mesa Vista Ranch. Three grazing treatments were simulated on plots about a yard square: (1) heavy overgrazing where vegetation on plots was clipped weekly to ground level, (2) moderate grazing where plots were clipped weekly to a height of 8 inches and (3) no grazing where vegetation on plots remained at a height of about 16 inches.

Simulated rainfall of 1 inch/week was added on top of natural rainfall to half of the plots under each treatment.

Ground temperatures on the overgrazed plots reached average values of 150—155 F in mid-afternoon. Bobwhites exposed to such temperatures would die of heat overload in an hour or so.

On the other hand, there was little difference in ground temperatures between moderately grazed plots and control plots (no grazing).

Artificial rain of 1 inch/ week had but a small, transient effect on ground temperatures.

Ground temperatures are important in quail ecology because the ground serves as a source of heat gain or loss. The body temperature of a bobwhite

averages about 108 F. When topsoil temperatures are below this value, quail lose heat to the soil. When soil temperature exceeds 108 F, quail gain heat from the soil. This gain causes them to invoke heat-loss behaviors (panting). When soil temperatures are high enough, the heat gain swamps heat-loss mechanisms and body temperature rises.

The incubation temperature of bobwhite nests is 99—100 F. Heat kills embryos in eggs when egg temperature reaches slightly higher levels.

## SPACE NEEDS FOR VIABLE POPULATIONS OF BOBWHITES

If you want to more or less guarantee bobwhites for your great great grandchildren, how many bobwhites do you need to start with?

Biologists answer such questions with **population viability analysis**. Basically, this involves taking everything we know about bobwhite population dynamics, formalizing this knowledge in a set of equations, imposing variation on population behavior and projecting populations into the future using a computer. Typically, projections number in the hundreds or thousands to gain some idea of average population behavior.

It doesn't take a rocket scientist to figure out that populations with lower numbers of birds are less likely to persist into the future. For example, if a

population starts with 1 bird, the population will soon go extinct.

How many bobwhites must we have now to insure a high likelihood of having them in the future. Computer analysis suggests populations totaling 800 birds are quite secure. Populations of this size should persist through droughts, blizzards and other catastrophes.

Eight hundred bobwhites need 3,000-4,000 acres of permanent, suitable habitat. This total is based on 4 acres or so per bird. At a more conservative 10 acres/bird, 8,000 acres is needed.

The computer modeling indicates populations consisting of 1—3 coveys are quite vulnerable to extinction, no matter how good the habitat in which they live.

The information summarized above was drawn from *Viability of Northern Bobwhite Populations* by Fred S. Guthery, Markus Peterson and Ronnie George. The research was a collaborative effort between OSU and the Texas Parks and Wildlife Department. For a reprint of the article, contact Fred S. Guthery, Department of Forestry, Oklahoma State University, Stillwater, OK 74078.

Feel free to use the information in Quail News. Please acknowledge the Bollenbach Chair and the Oklahoma Agricultural Experiment Station.

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Quail Questions.....

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*About a year ago my husband and son wanted to hatch some bobwhite eggs in an old incubator and then release them in the wild. The incubator broke when the first one hatched and all but one quail died. This quail immediately imprinted on our family, especially our golden retriever, and cannot be released because she's too tame.*

*I'm not quite sure when she first started laying eggs, but she hasn't stopped. This has been going on at least six months, maybe more. My question for you is regarding calcium in her diet. I'm afraid that her continually laying about an egg every other day will deplete the calcium in her bones.*

*I've kept up to 10 eggs in her clutch thinking she would stop when she felt she had enough. Because I have her in our family room in a large cage, I eventually have to toss the eggs because they'll rot. She does sit on them sometimes during the day.*

*Her diet consists of turkey crumble, gravel with oyster shells and millets. When she's outside, she finds bugs and ants, and my son will give her crickets. Before she started laying eggs, her feathers were so much prettier; her feathers definitely look stressed. Is there anything I can do to stop all this egg production?—Joanne Cope*

What a neat story!

**Copy QUAIL NEWS to kith and kin.**

The National Research Council recommends a diet consisting of 1% calcium for laying bobwhites. I suspect any laying ration for poultry would be adequate for your bird.

To stop egg production, Eric Hellgren, a physiologist and nutritionist in the Department of Zoology, OSU, says feeding a low protein (maintenance) diet should cause her to stop laying.

Bill Kuvlesky, a bird specialist with the Kleberg Institute at Texas A&M University-Kingsville, says put her in a dark room, as needed, so that she receives 10 hours of daylight and 14 hours of dark each 24 hours. This should shut down the hormonal system causing her to lay.

## BITS AND PIECES.....

- Fidel Hernandez, a quail researcher with the Kleberg Institute at Texas A&M University-Kingsville, observed nests success rates near 70% for bobwhites in South Texas during the 1999 and 2000 breeding seasons. This is an unusually high success rate. Given 3 nesting attempts, quail populations may replace annual losses with 30% nest success.
- Hal Werner and Jacky Hall of Amarillo, Texas, have re-established a black-tailed prairie dog colony on their ranch in western Oklahoma. Bobwhites frequently walk into the colony to feed near burrows. Bluebirds also use the colony as feeding grounds.
- Frank Robson is initiating bobwhite management on the Double R Ranch near Vinita in northeastern Oklahoma. The ranch currently supports 20—30 hunting trips per year. *Sericea lespedeza* is a major management problem addressed by spraying Ally. This chemical does not kill most woody plants.
- The August-September heat wave experienced in north Texas and western Oklahoma likely eliminated all or most of late-breeding season production. Hens quit laying when maximum temperatures hold steady in the high nineties and low one hundreds.
- Kim Suedkamp, a graduate student in the Department of Forestry at OSU, has been determining the effects of different grazing intensities on ground-nesting birds, including bobwhites. As part of this work, she measured properties of nest sites for different bird species in pastures under moderate, heavy and no grazing. The average properties of nest sites were similar across grazing treatments for a given bird species. This was an expected result. The implication is that variation in grazing intensity changes the availability of nest sites, but not the structure of nest sites that a particular species will use.
- Proceedings of the fourth national quail symposium will soon be available (\$20 plus postage) from the Tall Timbers Research Station, 13093 Henry Beadel Drive, Tallahassee, Florida 32312. The proceedings are a collection of technical papers.

\*\*\*Support Quail Unlimited\*\*\*

*On Bobwhites* by Fred S. Guthery (Texas A&M University Press, 2000) is available through the Department of Forestry, 008C Ag Hall, Oklahoma State University, Stillwater, OK 74078 (call 405/744-7061). Cost is \$25.00. Make checks payable to the Department of Forestry.

## RESEARCH REVEALS PATTERNS IN ROADSIDE COUNT DATA

The Texas Parks and Wildlife Department and the Oklahoma Department of Wildlife Conservation conduct annual 20-mile counts of quail in counties throughout these states. Jeff Lusk, a graduate student in the Department of Forestry at OSU, has been analyzing these data to determine how land use and weather affect population trends.

Based on statewide data from Texas:

- Counts decline as maximum air temperatures in June increase. Hotter Junes probably cause hens to fail to lay or to go out of laying condition. June is the most important production month in many regions.
- Counts increase as maximum air temperatures in July and August increase. This outcome makes no sense biologically. High July-August temperatures may force quail to use roadside cover, thus rendering them more likely to be seen during roadside counts.

- Counts increase with the amount of rainfall in the preceding winter.
- Counts decline as summer rainfall increases. This pattern also holds in Oklahoma. Because the outcome does not make sense biologically, it probably relates to a visibility effect. Summer rain, by increasing growth of vegetation, may make quail less likely to occur on roadsides and more difficult to see in any event.
- The optimum amount of cultivation in a county is in the range 10—20% of county area. Counts decline as percentage cultivation increases above 20% and quail disappear from landscapes at 50% cultivation or higher.
- Counts decline as livestock density on noncultivated land increases.

The results of Lusk's analysis show general patterns in count data collected during 1978—97. Exceptions to the general trends undoubtedly occur in local areas.

Support quail research. Send a tax-deductible contribution made payable to "OSU Foundation/Game Bird Research Fund" in care of Fred S. Guthery, Department of Forestry, 008C Ag Hall, Stillwater, OK 74078. Contributors receive *Quail News* and *Quail Flash*.