

QUAIL NEWS

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

SPECIAL EDITION ON QUAIL HARVEST MANAGEMENT

Wildlife scientists have studied quail harvest management since the 1930s. Along the way, there have been false starts, false assumptions and false progress. Such *always* happens as we learn about a topic through research. Always. Unfortunately, many bad ideas on harvest management linger like squatters in our minds.

Despite some lack of progress along the way, we have progressed. This special edition of *Quail News* documents that progress. Some topics have appeared in other numbers, but it is useful to have the main topics in one package.

One thing we have learned is that to avoid hopeless confusion, you must talk about harvest management at 2 levels: the management area and the state. Here we'll start with the management area. Certain concepts from the management area will apply to the state, but there are special issues (e.g., bag limits) in quail harvest management at the state level.

So, herewith, questions and answers for the management area.

Is harvest mortality additive or compensatory?

What do you want it to be? You have your druthers here. Nowadays, forward-thinking scientists regard this as a silly question.

Let's start with some definitions. *Fully* compensatory mortality means that whether or not you harvest birds during

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hunting season, you will have the same number at the start of breeding season. In other words, you lose no birds for every one shot.

Fully additive mortality means you lose exactly one bird for every one shot during the hunting season.

Additive mortality (note the modifier “fully” is gone) means that you lose a fraction of a bird for each bird taken during hunting season. For example, a bag of 10 birds might reduce the breeding population by 5 birds (you lose half a bird for each one taken).

In the real world, harvest mortality tends to be additive from fall to spring, as defined in the paragraph just above. Harvest tends to reduce the breeding population in comparison with a population not harvested.

Now for the rest of the story. If you do not reduce the breeding population too much, you can expect the same number of quail at the start of the next hunting season. So harvest may be viewed as additive during the hunting season and *fully* compensatory during the year. Take your pick.

You are probably beginning to see why “additive vs. compensatory” is not a very useful question in quail harvest management. The key point is you can extract a sustained yield from a quail population and, if you do your

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homework, a *maximum* sustained yield. The theory for doing so is detailed in *The Technology of Bobwhite Management* (Iowa State University Press, 2002).

Is late-season harvest more additive than early season harvest?

What do you want it to be? It is theoretically possible for late-season harvest to be more additive or more compensatory (including *fully* compensatory) in comparison with early season harvest. The outcome depends on properties of the quail population and on harvest rate (percentage of the population brought to bag).

In their excellent book, *Population Ecology of the Bobwhite* (Southern Illinois University Press, 1984), John L. Roseberry and Willard D. Klimstra *measured* late season harvest mortality that was more additive than early season harvest mortality in population of Illinois bobwhites (additive in the sense of fractional loss per bird shot).

However, it remains theoretically possible, based on what we know about quail dynamics, that a *light* harvest extracted late in the season could be more compensatory than the same harvest extracted early in the season.

The key matter is the *harvest rate*. If it is low, say less than 20% (including unretrieved loss) of the population on average, additivity, compensation and timing of harvest, among other matters, become non-issues; i.e., they become largely irrelevant in quail population dynamics.

What is a reasonable harvest rate and how do I achieve it?

If you get deeply into the respected literature—older and newer—on bobwhite population ecology, you will find these harvest rates (%) recommended: 0, 25, 30, 40, 45, 50, 55, and 70. (See what I mean about false starts in this business?)

The best current thinking indicates that southern-latitude bobwhite populations can sustain an *average* annual harvest of 30%; the value for northern-latitude populations is 40%. Because these are *average* rates, the harvest could be lower in low-population years and higher in high-population years.

The only way to know the harvest rate is to know the number of quail in a population at the start of hunting season. This number can be estimated with difficulty. Fortunately, there is an easier way to gauge harvest rate.

You can view harvest on a take-per-acre basis. The take includes birds put in the bag plus those downed and lost. The “acre” refers to *acres of suitable permanent cover, i.e., usable space*. This is a very important qualification.

An extremely conservative take is 1 bird/10 acres of permanent cover. Take of a bird/5–6 acres of permanent cover probably is reasonable during average years. Given high populations (boom years), you probably don’t need to worry about over harvest.

How many birds should I leave in coveys?

The notion that coveys should not be shot below some minimum number appeared in 1939 based on laboratory work by R. Gerstell. He found higher survival in severely cold-stressed birds if there were more birds in the covey.

There remains no field documentation, however, that limiting the take from any covey matters. Small coveys coalesce to form optimal-sized coveys of about 11 birds. This behavior is well documented for Illinois, Kansas and Texas and likely is general.

What is the main concern in harvest management?

Harvest rate. As mentioned earlier, many harvest management “issues” are of no consequence at light harvest rates. If you kill all the quail, of course, there will be none left.

STATE-SCALE HARVEST MANAGEMENT: FROM BIOLOGY TO POLITICS

While the biology just discussed for management areas holds at the state scale, the philosophy of harvest management drifts away from biology towards politics in states. This is as it should be. After all, we live in a pluralistic democracy and we are managing a public resource.

States have 2 primary concerns. First, they depend on hunting license sales for operating revenue, so they want the

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maximum possible number of hunters afield. Second, they have moral and legal mandates to serve the public. One way to serve the public is to provide maximum possible recreational opportunity with a public resource.

As a result of revenue needs (more hunters) and social mandates (more hunting), coupled with some early “findings” (now known to be wrong) on quail harvest management, states generally liberalized harvest regulations (bag limit, season length) starting in the 1950s and 1960s and continuing late into the Twentieth Century. Some states recently have restricted regulations because of the bobwhite decline in much of the eastern United States.

Through records maintained by state wildlife agencies on quail population abundance and total harvest, we have some general indications of the nature of quail harvest management at the state level.

What about daily bag limits?

If a daily bag limit exceeds about 8 birds, it is essentially meaningless. Put differently, a bag limit of 8 or more birds is tantamount to no bag limit at all.

"When one considers all regulatory options available to state wildlife agencies, ... it is apparent that ... wildlife agencies primarily control quail hunting (effort, means, methods) rather than the actual harvest of quail."—
Markus J. Peterson

(This does not imply your state agency is doing a bad job.)

The reason is that the average daily bag of a state's hunters ranges between 2 and 4 birds, with lower averages during population lows, higher averages during population highs. The probability of getting a bag limit of 8 or more birds is very, very low for the average hunter.

Reduction in the bag limit could be used to reduce the total harvest in a state. However, a meaningful reduction in harvest would necessitate very low bags; for example, 2 birds.

Why aren't bag limits reduced during population lows?

There are several reasons. First, state wildlife agencies like to keep harvest regulations as simple as possible and maintaining the same regulations fosters simplicity. Second, the number of participating hunters goes up and down with quail populations, so there is a built-in cushion for low populations. Third, to have any appreciable effect on the state harvest, bag limits would have to be so low (1 or 2 birds) during population lows that hunter participation would decline substantially. Fourth, given the scale of a state, any quail population benefits that might accrue from reduced bags would be imperceptible to hunters and biologists alike (the benefits would disappear in the vastness of a state).

What about season length?

The main political idea behind long seasons is that most state hunters have a limited amount of time (days) to go hunting. State agencies assume that

these hunters will be more likely to use that time hunting if they have more days from which to select. So long seasons are a means of maximizing recreational opportunity.

Another political concern relates to businesses that benefit from hunting expenditures, such as commercial guides, restaurants, motels and others that serve hunters. Obviously, these groups favor longer seasons.

Based on Markus J. Peterson's analysis of Texas hunters, less than 44% of hunters hunt beyond 3 days. Less than 10% hunt beyond 12 days. Peterson concluded that small reductions in season length would have little impact on the total harvest of quail in a state.

What do we know about harvest rates in states?

Very little. This is an important information gap because, as pointed out previously, harvest rate is the key issue in harvest management.

We do know that the harvest rate goes up as the quail population goes down, which is undesirable at face value. This outcome belies the notion widely held by state wildlife agencies that harvest is self-limiting (which is based on the number of hunters tracking quail abundance). Quite simply, the harvest of quail in a state is not self limiting.

Higher harvest rates in lower populations may be explained by the fact that skill of the average hunter goes up as the quail population goes down. The average hunter out in low-population years seems to be more experienced and knowledgeable, and he's probably

hauling better dogs, than the average hunter out in high-population years. This is not surprising. Hunters out in low-population years are indeed avid hunters.

Getting back to harvest rate: We can guesstimate harvest rates in states because we have estimates of total harvest and we know approximate quail densities in low- and high-population years. It seems at this time that harvest rates in states fall below 15% under the worst of conditions. This is a low rate. It is so low as to suggest that, from the state perspective, recreational harvest is fully compatible with sustained yield from a state's population.

Of course, we should not be cavalier about recreational harvest in declining populations. Biological as well as political issues come to the fore in this setting.

[Editors note: The theory and practice of quail harvest management is much more complex than presented in this newsletter. I have merely covered some of the main points.]

Our understanding of state-scale harvest management has increased greatly in the last couple of years, thanks to collaborative work among researchers and biologists with state wildlife agencies, including Roger Applegate, Kansas; Tom Dailey, Missouri; Andrea Crews and Mike Sams, Oklahoma; Steve DeMaso, Texas; and Jim Heffelfinger and Mike Rabe, Arizona.]



Editorial: awash in puniness

I had occasion to address a workshop convened by New Mexico Game and Fish in Las Cruces last July. That group is reviving interest in Gambel's and scaled quail management.

If you have ever viewed our sprawling, lightly populated western states, such as New Mexico and Arizona, from the perspective of quail cover management, you feel quite humble. It's sort of like facing off against a Payne County thunderstorm. You feel awash in puniness.

Where does one muster the ego to take on millions of acres of semiarid rangeland in the name of quail cover management?

Seems to me that ego comes from but 2 reasonable options—the cow and the match.

The cow is much maligned—properly so in some settings—as a bane of quail cover. (Of course, the cow makes no decisions on grazing management.) However, the cow is one of the few tools that may be applied at the daunting scales of our western states.

Professor Reldon Beck of New Mexico State University, a range management specialist, points out that changes in grazing program might not affect quail cover to a desired degree in semiarid

environments. The habitat die is cast in that vegetation has reached a stable state not likely to change without massive input of management energy and a lot of time for nature to change.

The match has awesome potential with limitations. It can be used to change the nature of millions of acres of quail cover in semiarid environments. However, the change might be good or bad. Burning per se does not more quail make in many settings. It is a tool for altering cover that is too heavy, which is not a recurrent problem in southwestern semi-deserts.

Is there a moral here?

Well, we have to be realistic. Changing the nature of quail cover on vast scales involves time, money and power (or persuasion). None of these is a biological issue.

Fred S. Guthery
Bollenbach Chair in Wildlife Ecology



BITS AND PIECES.....

- Visit the Bollenbach Chair website at <http://bollenbachchair.okstate.edu>. The website contains information on program, research, publications, links to other quail sites and evidence-based management, among other topics.
- The morning covey call (*koi-lee* or *hoy*) provides a method of locating coveys and of gauging the

abundance of bobwhites on an area. Coveys may or may not call when leaving roosts in the morning. Recent results from the Tall Timbers Research Station in Tallahassee, FL, provide particulars on when to listen for covey call and how to interpret what you hear.

***The best time to listen is from 35 to 15 minutes before sunrise.

***Of every 100 coveys observed, 58 called upon leaving the roost, on average. Because all coveys do not call, the call count underestimates the number of coveys in the range of audibility (the area over which a person could hear a covey if it called). As a crude rule of thumb, one might double the number of coveys heard to estimate the number in the range of audibility.

For further information, contact Shane D. Wellendorf, Tall Timbers Research Station, 13093 Henry Beadel Drive, Tallahassee, FL, 32312. Ask for a reprint of *Estimating Calling Rates of Northern Bobwhite Coveys and Measuring Abundance*.

- Recent research from Georgia indicates that bobcats may concentrate around feeders set out for bobwhites. However, the feeders also attract cotton rats and other rodents, which make up the vast majority of the bobcat diet. For further information, contact Ivy A. Goodbois, Jones Ecological Research Center, Route 2, Box 2324, Newton, GA 39870. Ask for a reprint of *Space-use Patterns of Bobcats Relative to Supplemental Feeding of Northern Bobwhites*.

- ***On Bobwhites*** by Fred S. Guthery (Texas A&M University Press, 2000) is available from the Department of Forestry, 008C Ag Hall, Stillwater, OK 74078 for \$25, including shipping and handling.
- ***The Technology of Bobwhite Management—The Theory Behind the Practice*** by Fred S. Guthery (Iowa State University Press, 2002) is available from the Department of Forestry for \$60.
- ***Bobwhites on Oklahoma Farms and Ranches: Management Options for Landowners*** by Fred S. Guthery, Ronald E. Masters, and Michael D. Porter is available free from the Department of Forestry.
- ***A Field Guide to Oklahoma Plants*** by Ronald J. Tyrl, Terrence G. Bidwell, and Ron Masters is now available. The book (515pp.) will be useful for hunters and ranchers as far west as the Texas Panhandle. It contains hundreds of line drawings and range maps. Contact Cindy Neal (405/744-6421) to order a copy (\$25 + \$5 shipping and handling—a real bargain).

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