

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 BOBWHITE PRODUCTION

The start of the 2005 nesting season is right around the corner. This special edition of *Quail News* is devoted to the intricate and complex processes that lead from an incipient breeding urge to hatching-year bobwhites on the ground at the start of hunting season.

In the beginning....

In the southern Midwest, early layers initiate nests around mid-April. Nest initiation for first clutches peaks about 3 weeks later. Initiation of second nest attempts peaks in mid-July. Second attempts include hens that lost a first clutch and hens that successfully hatched

a first clutch. Third initiations might occur after mid-July, but third initiations are relatively rare.

Based on data collected by Oklahoma Department of Wildlife Conservation biologists during the 10-year Packsaddle Study (1992–2001), first nest initiations represent 69% of the production effort, second initiations 26%, and third initiations 5%. Only about 3 hens in every 1,000 hens are expected to be responsible for the *laying and hatching* of 3 clutches in the same breeding season. Triple-brooding is quite romantic but also quite rare.

Although first nest initiation peaks in early June, some hens might not initiate the first clutch until the first or second week in August. Thus, you cannot tell whether any young brood you see represents a second or third hatch. However, later broods might represent

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second or third nesting attempts.

Indeed, *not all hens attempt to nest every year*. During the Packsaddle Study, about 36% of first-year breeding females did *not* incubate a nest, compared with 10% of older breeding females.

Nesting cover

What is good nesting cover? The dogmatic answer is “mid to tall perennial grasses.” Ample field research shows that that is a legitimate response, but that it sorely underestimates the inherent capabilities of bobwhites bent on begetting.

“For nesting,” wrote Aldo Leopold, “quail require moderately thin grass or brush on a well-drained spot....” “Relatively thin” to Leopold would be “relatively thick” to a manager in the southern Great Plains, at least west of I35.

Note that Leopold included brush as nesting cover. Bobwhites certainly nest in sand plum, skunkbush sumac, and other forms of low woody cover.

A recent report documented a bobwhite nest up in a bush.

Sand sagebrush provides excellent nesting cover where it occurs.

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Dale Rollins, Texas Agricultural Extension Service, San Angelo, and his students have documented widespread use of prickly pear as nesting cover in the Rolling Plains.

In rainy years in South Texas, bobwhites can be highly productive in a virtual absence of perennial grasses.

But, that’s much too cavalier. Perennial grasses are the backbone of ground cover on southern rangeland. These deep-rooted plants stabilize the near-ground environment to the benefit of bobwhites. Ranches with goodly compliments of perennial grass tend to carry more bobwhites year in and year out than ranches that supply mostly annual plants. Ranches with goodly compliments of perennial grasses practice conservative grazing.

Nest success

Nest success is tricky to interpret. A recent review by Dale Rollins and John P. Carroll, University of Georgia, indicated average nest success of 28% (4,506 nests followed in 11 studies). Holy smoke! Only 28 of every 100 nests started put chicks on the ground. Generally, predation was *reported* as the main source of nest loss.

Depending on the study, nest success ranged from 12 to 50%.

The average nest success of bobwhites is not as alarming as it seems because the birds make multiple nesting attempts. On the Packsaddle Area, for example, each hen in the fall population was “responsible” for 3.1 nesting attempts in the laying season just ended. The quotes bound “responsible” because here we are

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toting up all nesting attempts, including those made by hens that didn't survive to the start of fall. Nonetheless, some of them contributed to production and there is nothing illegal or immoral about giving those attempts to surviving hens.

So, interpreting nest success in terms of surviving hens, we find that 98.4% of those that nested were successful in bringing off at least 1 clutch. Slightly more than 40% of surviving nesters might hatch 2 clutches at 28% nesting success and 3 nesting attempts.

Heating and air conditioning the nest

Although the egg-warming function of a setting quail is well known, the cooling function is not widely appreciated. Too hot is much more dangerous than too cold for the embryo in a bobwhite egg. In general, incubating birds guard against hot temperatures more zealously than they guard against cool temperatures.

In mid-latitude America, the temperature of bobwhite eggs in an incubated nest averages about 93.0 F (33.7 C). The actual temperature is variable because adults leave the nest to feed. However, egg contents stay within the temperature range 86.0 F (30 C) to 95.0 F (35 C).

Incubating adults tend to leave the nest once a day. Some exit in the morning (6–9 a.m.), but most leave around 5 p.m. Bobwhites might leave the nest at any time of the night or day as determined

with miniature cameras placed to monitor nests.

Chick survival

The survival rate of bobwhite chicks from hatch to hunting season is difficult to estimate. Chicks are small, fragile, and inconspicuous. Biologists have developed indirect methods of estimating their survival that involve the survival rate of hens, estimable with radio telemetry, and age ratios at hatch and at the start of hunting season.

The indirect methods indicate that the average bobwhite chick on the Packsaddle Area survived at a rate of 56% from peak hatch (19 June) to 1 November (135 days). Loss was highest during the first 30–35 days post hatch. During this period, bobwhite chicks are tantamount to fuzzy salamanders because they are essentially cold-blooded. They develop the ability to generate body heat at about 4 weeks of age.

Summer increase

In southern Illinois, where bobwhite populations are more productive, on average, than in more southerly latitudes, the breeding population multiplied itself by 1.7 from the start of breeding season to autumn in the average year; i.e., 100 breeders produced 170 young. This represents a 270% spring-to-fall increase. The multiple ranged from 0.9 in poor production years (190% increase) to 2.8 in excellent years (380% increase).

The not-nest problem

It is tempting to think that if we could just get rid of the nest predators, we would have good quail production every year. Thinking doesn't get much more wishful than this.

Nest predators can't destroy nests that never were, and these not-nests can be quite plentiful in a bad production year.

One way to look at a perfect nesting season is to view it as one that provides the maximum number of nesting opportunities. Such a season will be relatively cool, and perhaps moist, during July and August, at least in the Southern Great Plains.

This is obvious if you think about it. Great production years like 1987, 1992, 1997, and 2004 did not occur because of nest predator control, but rather because they were years of vast opportunity in quaildom and not-nests were few.

What contributes to the abundance of not-nests in a breeding season? Here are some problems:

- The percentage of hens that lay decreases.
- The number of nesting attempts per laying hen decreases.
- The number of days in the effective laying season decreases.

In general, nesting opportunities decline in comparison with a good breeding season. Nesting opportunities not available, not predators, may be the hammer that smashes production.

Everybody knows that breeding seasons with a high prevalence of not-nests tend to be hot and dry. The 1998 production season provides a classic

example. Temperatures in the 100s started in May and continued through August and bobwhite production was extremely low.

The point to bear in mind is that not-nests can be more devastating to quail production than nest predators.

The best way to reduce not-nesting is to maintain robust herbaceous cover over large areas. However, it is not possible at this time to eliminate not-nesting. Even in ideal nesting cover, the temperature experienced by an incubating bobwhite on a hot summer day (e.g., 108 F or 42.2 C) reaches killer levels.

THE FATE OF BOBWHITE EGGS IN A TYPICAL PRODUCTION YEAR

- 100 eggs laid. About 75 are lost to predators, infertility, abandonment, and other causes.
- 25 chicks hatch. By 1 November, about 11 remain. Predation, exposure, and other causes contribute to losses.
- 4-6 adults from the 100 eggs are available to breed in the next laying season.
- The annual mortality rate of bobwhites averages 94-96% if life starts with an egg.

HOW FAR DO HUNTERS AND BIRD DOGS TRAVEL?

The quail research team at Oklahoma State University has

begun studies of rates and distances traveled by hunters and bird dogs in pursuit of bobwhites. These results will assist in management of the harvest on areas that receive intense hunting pressure, such as certain state wildlife management areas.

The team collected data on the Sutter Ranch in west-central Oklahoma on 13 December 2004. This ranch has goodly quantities of excellent bobwhite habitat with an infrastructure of sand plum and more native foods than the quail population can make a dent in.

We fit Don Walker and 3 different pointers with GPS units about the size of a Zippo lighter. These units used satellites to fix the locations of hunter or dogs every 7 seconds. On any hunt, 2 dogs were on the ground.

In about 4.6 hours of actual hunting, the dogs accumulated 36.8 miles of travel. The hunter accrued 6.6 miles.

The dogs were close-working pointers. The average distance between the hunter and dog Bud was 25 yards, while this average distance was 38 yards for dog Joe.

The dogs average rate was 4.0 mph, whereas the hunter's was 1.5 mph. These slow rates accrued in part because the party flushed around 15 coveys (3.3 coveys/hour) and spent considerable time chasing singles.

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*Editorial: the strange case of edge*

Robert Louis Stevenson's *The Strange Case of Dr. Jekyll and Mr. Hyde* is a classic work on the conflict between good and evil. In a similar vein, a harmless biological construct—edge—is taking on good and evil properties nowadays. Whether it's good or evil depends on what parts of nature you happen to fancy.

If you fancy, say, nongame birds, you probably hold a derogatory opinion of edge. It might precipitate high rates of nest loss owing to the meso-varmints that travel along edges where birds nest. In grasslands, more woody edge implies declines in the diversity and abundance of grassland birds, which are in as much trouble as bobwhites in much of America.

On the contrary, if you fancy bobwhites and other quail you possibly hold a high opinion of edge. After all, Aldo Leopold himself said the more edge you have, the more quail you will have, within ordinary limits.

Leopold's "edge effect" has been thoroughly discredited at this juncture. His principle contains a grain of truth, but it is not general and there are numerous, known exceptions.

For example, situations occur where you can increase or reduce the amount of edge without impact



I think the odds would be against getting a wild population established. This just reflects the history of introduction of game birds. I suppose state game departments released dozens of species back in the 40s and 50s (when it was politically correct to do so) but the only ones that took, at least on the mainland, were pheasants, Hungarian partridge, and chukars. Hawaii is rife with introduced game birds. Of course, our native wild turkeys have been re-established where they were lost.

I can't predict how bobwhites and guineas might interact. There would be some overlap in diet and cover use, but whether this would be inimical to bobwhites remains speculative.

## BITS AND PIECES.....

- “Rehabilitating and releasing abandoned or ‘picked up’ white-tailed deer fawns back to the wild is a popular alternative to euthanasia, but the fates of these fawns are often unknown,” report Jeff Beringer and co-workers in the *Wildlife Society Bulletin* (32:732–738, 2004). These researchers found that 22 of 42 rehabilitated fawns died within 30 days of release. “Those that survived did so around human dwellings and may have become a nuisance or presented public safety concerns.” Contact Beringer at Missouri Department of Conservation, 1110 South College Avenue, Columbia, MO 65201 for a reprint of the paper.
- Brett L. Walker, University of Montana, and co-workers report that west Nile virus caused a 25% decline in sage grouse survival across Alberta, Wyoming, and Montana in

2003. Some local populations were not affected by the virus.

- The helmeted guinea fowl, which occurs naturally in southern Africa, has been domesticated and occurs in America. On farmsteads, guineas are excellent security guards because they announce the presence of trespassers with their cackling alarm call. For you Scrabble players, guinea fowl chicks are called “keets.” (from *Gamebirds of South Africa* by Rob Little, Tim Crow, and Simon Barlow; Struik Publishers, Capetown, 2000).
- ***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.

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