

QUAIL NEWS

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

CHEMICALS AND CHICKS

Northern bobwhite quail have declined significantly over the past 30 years, report William E. Palmer and associates, North Carolina State University. A potential contributing factor to reduced quail numbers on agricultural landscapes is the effect agrochemicals may have on survival of quail chicks.

Palmer set out to determine how agrochemicals used on soybeans in North Carolina affect the survival of bobwhite chicks. He and coworkers ran the experiment on soybean fields with and without field borders designed to provide nest cover for bobwhites.

Based on data from birds carrying radiotransmitters, adults spent about 65% of their time in soybean fields during the breeding season. The quail showed

preference for field borders allowed to grow up in native cover.

Bobwhite hens also nested extensively in soybean fields after the vegetation canopy closed. Slightly more than half the nests initiated after mid-July were in soybeans. Palmer estimated that about 60% of production occurred after mid-July, due in part to relatively high nest success in soybeans.

"Insecticide applications to soybeans temporarily increased

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the availability of arthropods to quail chicks," Palmer reported. "Chicks in pens sprayed with insecticides ingested at least 23 times more biomass of insects than control chicks. The propensity of quail chicks to feed on poisoned arthropods increased the opportunity for significant exposure to insecticides."

However, the effects on chicks depended upon the chemical used to control pests in soybeans. Two chemicals had no effect on quail chicks. A third, methyl parathion, cause chicks to lose weight. Parathion also interfered with brain activities, which renders chicks more vulnerable to predators and other sources of loss.

Palmer and associates concluded that agrochemicals do not explain the long-term quail decline on agricultural landscapes in North Carolina. The researchers felt that loss of habitat for nesting and brood-rearing is the main cause of the decline.

For further information, contact William E. Palmer; Tall Timbers Research Station; Rt. 1, Box 678; Tallahassee, FL 32312. Ask for a reprint of *Effects of Foliar Insecticides on Survival of Northern Bobwhite Quail Chicks*.

HEAT REDUCES HABITAT SPACE

High temperatures may cause wild animals to avoid habitat, leading to thermal fragmentation of habitat, report N. David Forrester and associates, Caesar Kleberg

Wildlife Research Institute, Kingsville, TX.

Forrester and co-workers determined the amount of habitat lost to bobwhites in South Texas because of high temperatures at quail level. They measured what is called operative temperature. This temperature adds the heating effects of sunlight to air temperature and deducts the cooling effects of breezes. Usually, operative temperature is a few degrees higher than air temperature. Quail respond to operative temperature.

Based on the results of Forrester and coworkers, an operative temperature of 102 F is critical to bobwhites. These birds avoid portions of their habitat where temperatures exceed this level.

Bobwhites lose the ability to control body temperature when operative temperature exceeds 102 F. In other words, like a jogger on a hot summer day, they are vulnerable to heat stroke at higher temperatures.

Forrester estimated that on an annual basis in South Texas, about half of habitat space is avoided because temperatures are too high. Up to 75% of habitat space may be avoided during summer and autumn.

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"Management of the thermal environment involves the structure, composition and dispersion of vegetation," Forrester reports. "Woody plants provide thermal cover for loafing, and bobwhites in subtropical environments select taller woody cover on hotter days, presumably for cooling effects.

"Thus, taller woody cover should be well dispersed on a management area. Herbaceous ground cover reduces operative temperatures via shading from solar radiation and via the cooling effects of evapotranspiration."

For further information, contact Fred S. Guthery, Department of Forestry, Oklahoma State University, Stillwater, OK 74078. Ask for a reprint of *Operative Temperature Reduces Habitat Space for Northern Bobwhites*.

NORTHERN BOBWHITES?

What is a northern bobwhite?

Biologists who write for scientific journals use the term "northern bobwhite" to describe what everybody else calls "bobwhite." Northern bobwhite is the complete common name, as specified by the American Ornithologist's Union. Journals mandate that the full, accepted common name be used. This style fosters better communication among biologists throughout the world--everybody knows precisely what everybody else is talking

Copy Quail News to *kith*
and *kin*.

about. For example, bobwhites may be called partridges in Mexico.

PREDATOR SMORGASBORD

"We provided supplemental food for striped skunks during the nesting season in managed uplands of the Prairie Pothole Region to test whether food availability would influence nest success of ducks," report Raymond J. Greenwood and associates, Northern Prairie Wildlife Research Center, Jamestown, ND.

The researchers established 24 test sites. Twelve served as experimental controls; i.e., nothing was done on these sites to provide a standard of comparison with the other sites. Skunks on the other twelve sites received a 10:1 mixture of chopped fish offal and sunflower seeds.

The success rates for duck nests averaged 41% on the offal sites and 29% on the control sites. The researchers concluded this difference was "not statistically significant." The practical interpretation is that providing food for skunks had no meaningful effect on nest success.

Losses to skunks averaged 11% on the offal sites and 24% on the control sites. Thus, the food-provisioning seemed to reduce nest losses to skunk. This reduction was compensated by increased losses to other predators, resulting in no effect in overall losses.

"Provision of supplemental food apparently has limited value for

managing depredation of upland duck nests in the Prairie Pothole Region where predator communities are complex," the researchers concluded.

For further information, contact Raymond J. Greenwood, Northern Prairie Wildlife Research Center, Jamestown, ND 58401. Ask for a reprint of *Effects of Food Supplementation on Depredation of Duck Nests in Upland Habitat*.

PRESCRIBED FIRE AND PYRENEES PARTRIDGE

Cattlemen in the French Pyrenees burn rangeland to control the invasion of a woody plant called broom. Gray partridges, formerly called Hungarian partridges, inhabit these rangelands. Whereas burning is an indispensable tool for managing game bird habitat in many settings, the general rule doesn't hold for partridges in France.

"The most critical effect of burning on gray partridge brood habitat was the reduction of the cover in the 2 vegetation layers providing protection against predators," report Claude Novoa and associates, *Office National de la Chasse*, Prades, France. The habitat recovered within 5-8 years after burning, depending upon the intensity of the fire (recovery took longer with more intense fires).

Novoa and associates recommended small burns (12-13 acres) dispersed in unburned patches of 25-45 acres. They

recommended a burning rotation of 15-20 years.

The conservative recommendations for prescribed burning for gray partridges in the French Pyrenees are in stark contrast to recommendations for bobwhites in some parts of the United States. In areas with high rainfall and long growing seasons, a 2-year rotation of fairly extensive burns may be acceptable for bobwhites. Conversely, burning may be unnecessary in the drier portions of bobwhite range, particularly in the presence of cattle grazing.

Richard Bache, son-in-law of Benjamin Franklin, introduced gray partridge into the United States in the Eighteenth Century. This introduction failed, as did several others in the United States over the next 100 years.

In 1908 a sportsman's group near Calgary, Alberta, imported some 200 pairs from Hungary and released them. Within 5 years, birds had spread throughout southern Alberta and into Saskatchewan. Huns now occur in the northern tier of states and the southern tier of provinces approximately from the Great Lakes to the Pacific.

For further information on the partridge study, contact Claude Novoa; *Office National de la Chasse, Direction de la Recherche et du Developpement, Bd de la Gare, 66500 Prades, France*. Ask for a reprint of *Changes in Reproductive Habitat of Gray Partridge After Burning*.

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I have conducted a radiotelemetry study on game farm chukars. Last January we radiotagged 12 birds and put colored plastic collars on 38 of them (25 pairs total). All radiotagged birds were dead by mid-June (causes of death were predation by foxes, brown rats, raptors and starvation). The last radiotagged nesting female was killed on the nest by a rat. We saw 2 collared females with 7 chicks and some collared males later in the year. On opening day 9 collared birds were bagged within 200 yards of the release site. In the course of the study we observed collared birds paired with wild stock. Why do you think we had different mortality rates between radiotagged and collared birds?--Nick Kassinis, Limassol, Cypress

First, the number of birds you worked with is low. Your results might have been different if you had had a larger number of radiotagged birds.

Second, the radiopackage may have handicapped your birds, leading to higher mortality rates. Can you imagine an Olympic hurdler packing a backpack totaling 3-4% of body weight? Just as a backpack would handicap a hurdler, so might a radiotag handicap a game bird. The handicap would translate to higher mortality through predation and other effects.

Some radiotelemetry studies of bobwhites yield mortality rates too high to make sense. That is, populations would go extinct during a study if the

mortality rates estimated for radiotagged birds were accurate.

On the other hand, mortality rates estimated using radiotelemetry seem reliable in some areas. A case in point is the Packsaddle Study conducted by the Oklahoma Department of Wildlife Conservation.

Radiotelemetry involves putting a small radio transmitter (4-6 grams) on a bird. Different birds can be identified by different frequencies of the transmitters. Transmitters may be mounted in a backpack structurally similar to a backpack used by humans, or they may be mounted with a bib arrangement, structurally similar to a bib used by humans. Sometimes transmitters are surgically implanted under the skin of a research animal.

Biologists can locate radioed birds with the aid of an antenna and receiver. This ability to locate study animals has helped tremendously in understanding habitat use, movements and population behavior.

Multiple-brooding by bobwhites, for example, was confirmed with radiotelemetry. We had strong evidence that it existed before telemetry came along, but no proof.

Transmittered birds may be encumbered by the transmitter, antenna of transmitter and attachment apparatus. Thus, telemetry results may give a blemished picture of game bird behavior.

We are trying to turn our open sandy country into better quail habitat under average conditions. In 1997 we had incredible numbers of quail in very open country; but we had the thermal protection of big rains in May and June of that year as well as lots of resulting ground cover. In 1998 we did not produce any juvenile birds in this area.

You say that canopy coverage of brush of 15% is the minimum for bobwhites and that quail should be no more than 50 yards from woody cover. Does prickly pear qualify for woody cover? What are its advantages over woody species and what are its disadvantages? Would you rather have a half-cut mesquite or a clump of prickly pear in an otherwise open area.

Our strategy is to build quail tepees and link them by rows of planted prickly pear. We will also half-cut some of the bigger mesquites. These practices will be combined with virtually nonexistent grazing. Are we wasting our time--especially planting the prickly pear?

What is your opinion of the results of planting prickly pear on the Circle H Ranch?--Stuard W. Stedman, Houston, TX

Prickly pear qualifies as woody cover in South Texas, where it grows to

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heights of 10 feet. The sparse and low prickly pear of Oklahoma would not qualify as woody cover.

The advantages of Texas prickly pear are that it is easy to plant (you just cut off a pad and lay it on the ground). It is also easy to kill if you want to get rid of it. Pear is sensitive to herbicides and to burning.

A disadvantage is that it may become too thick.

A clump of mature prickly pear is better than a half-cut mesquite, because the pear will provide quality cover year around. The cover quality of a half-cut mesquite will decline with leaf drop each winter.

The Circle H Ranch had large abandoned farm fields when habitat management began. To correct an obvious deficiency in woody cover, we put in clusters of tepees on a 15-acre grid. (A tepee is just a vertical stack of fence posts or brush limbs, formed in the shape of a tepee.) We used clusters of 6 tepees spaced at about 10-yard intervals (3 x 2 grid) instead of singletons because research results indicate bobwhites prefer clusters over singletons.

We used a 15-acre grid as a compromise between quail needs and the reality of the amount of work required on the 1,200 or so acres subject to management. For example, 2-acre blocks likely would be much better for bobwhites. We envisioned a future where brush was likely to move naturally into the farm fields. The 15-acre blocks were also set up for patchwork burning to manage this brush.

We connected the tepee clusters with pear hedges to improve the amount of usable space in the fields over the long term. That is, the pear hedges were meant to provide secure travel corridors to different parts of the fields. Lacking these corridors, portions of the fields would be unavailable to bobwhites. Survival of pear hedges was excellent on lighter soils, poor on tighter soils. The growth rate was low where pear survived.

The best a manager can do for the bobwhites on an area is to make all space usable at all times. This idea originated with the founding fathers of game management, including Herbert L. Stoddard, Aldo Leopold, Paul L. Errington and Valgene W. Lehmann. They perhaps did not realize the overriding importance of the concept.

Because the management you are practicing will make more habitat space usable more of the time, it is expected to increase the average abundance of bobwhites.

SUMNER ON CAL QUAIL

E. Lowell Sumner, Jr., studied the biology of California quail during the early 1930s. California quail, also called valley quail, are a western species closely related to Gambel's quail.

"Although exceptions are sometimes observed," wrote Sumner, "there is a fairly definite cruising radius from cover of about fifty feet, beyond which the birds usually will not venture even when pressed by hunger, so great is their aversion to open places."

By cover, Sumner meant woody cover. Bobwhites also hold an aversion to open places; i.e., habitat lacking woody cover. Sumner noted that woody cover can become too widespread, in which case California quail decline.

"Indiscriminate liberation of quail," he observed, "would have the same effect upon the existing population ... as the dumping of a trainload of unemployed people would have upon a depression-ridden city whose inhabitants were until that time just able to get along; in both cases starvation conditions would result."

Sumner found membership in coveys changed with time, and that coveys maintained a fairly constant size as the total population dwindled through natural attrition and harvest. This same outcome holds for bobwhites.

"[T]he covey is analogous to a river, which constantly maintains itself although the individual drops of which it is composed continually pass onward."

Sumner documented the death of California quail chicks (2-3 days old) from heat overload.

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