QUAIL NEWS

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

QUAIL SCENT

William G. Syrotuck published *Scent and the Scenting Dog* in 1972. The book relates largely to dogs bred and trained to find or rescue humans. Nonetheless, it has ideas that probably apply to bird dogs.

A dog's remarkable sense of smell arises because it is bio-engineered to detect scent. "Almost one eighth of the dog's brain and over 50% of the internal nose is committed to olfaction, whereas the human olfactory lobes are very much smaller, and the area of olfactory cells is about one square inch," writes Syrotuck.

A man has about 5 million olfactory sensory cells, whereas a German sheep dog has about 220 million. The dog has a long nose to accommodate these cells.

A dog's sensitivity to some chemicals is 100,000 to 100 million times greater than a man's. A dog's nasal membranes must remain moist for it to detect scent with maximum effectiveness. This has to do with trapping scent molecules and converting them to neural impulses, which are sent to the olfactory lobes of the brain for interpretation.

Scientists from Norway recently discovered another advantage that bird dogs have. Because of the engineering of the nasal passages, mouth, and throat, a dog can continually draw in scent through its nostrils as it pants through its mouth.

Syrotuck argues that skin rafts are the main source of human scent. The skin of humans has a base layer that continually produces new cells. Cells at the skin surface are, accordingly, continually sloughing off in the form of

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rafts (collection of cells). Humans shed an estimated 40,000 dead skin cells/minute. A hunter walking at 3 mph sheds about 150 skin rafts/foot.

Bacteria begin decomposing skin cells even before we slough them. The decomposition leads to the production of simple molecules that presumably constitute scent. Bacterial decomposition of skin rafts continues after they have fallen to the ground.

The rate of decomposition of skin rafts, and therefore the intensity of scent, depends primarily on temperature and humidity. The maximum growth rate of bacteria populations occurs at surprisingly high temperatures a little to the east and west of 40 C (104 F). Lower temperatures reduce the rate of decomposition.

Moisture in the form of humidity also is necessary for decomposition and scent production.

Sunlight and high temperatures kill bacteria. Lack of moisture causes them to reduce or eliminate activity. These factors would reduce the intensity of scent production and presumably make a lost man or a wary covey harder to find.

Dehydration and rehydration of skin rafts could make scent disappear and reappear.

The skin raft hypothesis is well and good for hunting men but it seems questionable for hunting quail. The surface area over which a covey sloughs skin cells must be much smaller than that of a man. However, coveys have feathers that markedly increase surface area. These produce feather dust, which you recognize may be thick if you've kept a pet bird or visited a bird propagation facility. There is no reason to suppose feather dust won't decompose from bacteria because feathers are just modified skin.

Keep in mind that if feather dust behaves like skin rafts, each quail continually produces a scent cloud because of decomposition before the cells slough. Chemicals from the breath and skin secretions might intensify the cloud.

Fresh droppings might be another cue for bird dogs. The rate at which a quail drops droppings is unknown. I ran across an estimate of 25–50 eliminations/day for caged pet birds. At that rate, a covey of eleven might be depositing globs of colin eau de cologne at a rate of one per 2.5–5.0 minutes.

Syrotuck points out that the scenting conditions pertaining to dogs may differ markedly from those perceived by hunters. Wind speed is an example. When a hunter experiences wind of 10 mph at eyebrow level, a bird dog experiences wind less than 1 mph at nose-on-the-ground level.

Now let us go where no one seems ever to have gone in theoretical birddogology. Let us conjecture that a bird dog operates under 2 threshold conditions. One threshold causes him to slow down and investigate and the other

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causes him to go on point. The density of scent molecules in the air, and hence the strength of signal that a bird dog receives, might demark these 2 thresholds.

I conjecture that sight might be involved to some degree in releasing the point threshold. We have little idea what a dog perceives visually. We know that they are red-green color blind and that, as card-carrying predators, they are adept at detecting movement. Might a nervous bobwhite that turns its head or blinks too rapidly give away the location of a covey to a dog on the verge of pointing? We'll probably never know for sure. But anybody who hunts knows that bird dogs can see moving quail that we cannot see (witness the creeping point of some dogs when coveys creep).

My dad was among the soldiers who liberated Manila during The Big One. He received military training on visually detecting the enemy. One day when we were hunting mule deer in northeastern Oregon, he pointed out that it was easier to detect movement if you watched an object that doesn't move.

Aunt Fern was on a stand about a quarter mile away. By watching a ponderosa pine near her, I could easily tell when she moved. I don't know whether this pertains to bird dogs, but they might have some visual con games that help them locate coveys.

Whatever causes a dog to go on point, there is considerable variation in the distance from point to flush. Grant Mecozzi, a graduate student in the Department of Natural Resource Ecology and Management, OSU, obtained point-to-flush distances on 61 occasions during the 2005–2006 hunting season. These distances were for coveys of 5 birds or more. The average distance was about 8 yards, the smallest distance was about a half yard, the largest about 30 yards. The large range (0.5–30.0 yards) speaks to the variability.

Why so much variation? Probably because of variation in…the skill and ability of individuals dogs…scenting conditions (humidity and temperature)…direction of approach relative to direction of the wind…the nature of an encounter (planned or accidental)…size of covey (either smaller coveys had a weak tendency to hold tighter or that larger coveys had a weak tendency to flush wild)…statistical demons. These demons imply that even if we hunted the same dog under identical conditions we would observe variability in point-to-flush distances. Life is rampant with statistical demons.

PREDATOR CONTROL, HABITAT MANAGEMENT FACE OFF IN NORTH CAROLINA

The relative merits of predator control and habitat development as bobwhite management practices have long been debated. A recent study in North Carolina sheds some light on this contentious issue.

The study took place during 1997–1999 on the coastal plain. This region consists of about 40% farmland devoted to soybeans, corn, cotton, wheat, and tobacco.

The researchers selected 3 areas. In each area, they selected 4 farms. One farm served as the experimental control (no management), one received only predator control, one received only field border development, and one received both predator control and field border development.

Field borders were 3–6 yards wide. They were allowed to revert to wild vegetation consisting of grasses, forbs, and shrubs. The field borders made up 9–13% of tilled land.

Intense predator trapping took place during February–May in an effort to reduce predator abundance during the early nesting season. Predators included red foxes, gray foxes, raccoons, and opossums.

Summer abundance was gauged by the average number of males whistling "bobwhite" at listening stops. This index ranged between 1.5 and 2.1 males/stop and was, for all intents and purposes, indicative of little or no response to either predator control or field borders.

The researchers used morning covey calls to index the abundance of bobwhite coveys in early autumn. Predator control had *no effect* in comparison with the experimental control. Field borders added about 1 covey to the index, and field borders plus predator control added 2 coveys in comparison with the experimental control. Abundance of bobwhites on sites with field borders was 81% of that on sites with field borders and predator control.

"Field borders resulted in increased bobwhite abundance on farms," the authors concluded, "and therefore including field borders as a management option in regional recovery plans is valid. However, enhancing bobwhite populations beyond the levels found in this study likely will result only from habitat improvements across the farmed landscape, such as thinning and prescribed burning of forests to promote suitable year-round habitat for bobwhites. Reduction of … nest predators increased bobwhite abundance on farms with field borders, but population improvements were not sufficient to warrant the costs of predator trapping."

For further information, contact W. E. Palmer at Tall Timbers Research Station, 13092 Henry Beadel Drive, Tallahassee, FL 32312. Ask for a reprint of *Effect of Field Borders and Nest-predator Reduction on Abundance of Northern Bobwhites.*

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Editorial: I can solve the quail problem

I have jokingly said I could solve The Quail Problem in Oklahoma with 3 things: $2,000,000,000, dictatorial power, and 20 years.

I'm not sure whether $2,000,000,000 is enough, though. We would have to convert hundreds of thousands of acres to bobwhite habitat. The conversion would entail the planting of perennial grasses and woody cover.

Woody cover needs are daunting, indeed. To make a section (640 acres) lacking wood cover fully

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usable, we would need to plant more than 500 thickets.

Or to reduce the age of mature cross timbers forests such that they are habitable by bobwhites, we would have to spend something north of $250/acre. Maybe much more.

I don't know if dictatorial power is sufficient. I would rather have that plus a little divine guidance.

Tradition. Livelihood. Heritage. Rights. All these words come into play when you think about reviving quail populations on private land in a pluralistic, capitalistic democracy. This is as it should be. But these dear values do represent roadblocks if you are narrow minded about increasing quail.

Maybe you better give me 30, 35 years. Our rehabilitation work will take a decade or more, our habitat developments will need time to mature, and our quail populations will need time to respond to the habitat developments.

In that I am not going to get more than $2,000,000,000, dictatorial power with divine guidance, and 30 years, I probably will not be able to solve The Quail Problem any time soon.

Indeed, resolution of the quail situation will take a long-term, concerted effort from individuals, agencies, and organizations. I think we should attack the problem piecemeal with strategy. Attacking in a purely piecemeal fashion—a token hither, a token thither, a token yon—won't work. We know this already. This is like adding little to nothing.

But if we put piecemeal attacks together in a strategic fashion, we have an opportunity for increasing bobwhites in local areas. What I am arguing for is concentrating piecemeal attacks in small areas.

It works. During 1956–1964, Remington Farms on the Eastern Shore of Maryland went from 5 to 38 coveys by focusing efforts on 3,000 acres. This was an increase of 400 bobwhites.

Fred S. Guthery
Bollenbach Chair in Wildlife Ecology

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WATER LOSS AND GAIN IN BOBWHITES

The physiological goal of bobwhites is to balance water loss and water gain. The birds have a remarkably complex system for achieving this goal.

Sources of water loss include breath, evaporation from the body surface, fecal matter, and eggs.

Sources of gain include metabolic water, preformed water, and free water.

The digestion of foods produces metabolic water. Carbohydrates yield 56%, proteins 40%, and fats 107% of their mass as water. For example, if a bobwhite ate 2.0 g (grams) of carbohydrate, this would return 1.12 g of water.

The water in foods is called preformed water. Seeds range between 1 and 5% water, insects between 40 and 80% water, and greens and fruit between 50 and 98% water.

Free water is that available as dew and in ponds and streams.

Bobwhites cannot persist on metabolic water (produced by digestion) alone. They must also have some out-of-body source such as the water in foods and free water.

During winter, a bobwhite of specified size turns over more water than it would during summer. This occurs because it must eat more food during cooler weather, and digestion requires a fixed ratio of water to food.

Laying hens require additional water because eggs are about 70% water. Research has demonstrated that hens can lay if metabolic water plus that in foods are the sole sources of water. Laying hens do not need free water.

The high body temperature of bobwhites and other birds is a water conservation adaptation. A bobwhite's body temperature hovers around 42 C (108 F). This high temperature permits dissipation of body heat through the process of radiation. An alternative source of heat loss, evaporation, is water–costly. Thus, the high body temperature of bobwhites effectively reduces the need for out-of-body sources of water.

Quail can usually beat [blue darters] to thick cover, provided it is within a hundred yards or so, for they are very fast for a short distance.—Herbert L. Stoddard, *Memoirs of a Naturalist*, University of Oklahoma Press (1969:254).

BITS AND PIECES.....

- The **Red River Quail Symposium** will be held in Wichita Falls, TX, 11–13 October 2006. The theme is "habitat management and hunting in transition." A visit to the Birdwell and Clark ranches takes place on Wednesday, followed by a steak BBQ. Thursday is a sit-down session at the Wichita Falls Multi-purpose Event Center. Friday is a field trip to the Clark Ranch. Registration is $50 before 15 September and $75 thereafter. For registration information, visit http://www.texas-wildlife.org/PDFs/2006%20RRQS%20Initial%20Flyer.pdf. Dale Rollins, Texas Agricultural Extension Service, and Fred S. Guthery, Oklahoma State University, are co-sponsoring the event.
- The **Department of Natural Resource Ecology and**

Management has become a reality at Oklahoma State University. The department brings together specialists in the ecology and management of fish, forests, rangelands, and wildlife. At this time, the department has about 25 faculty members. It also has a full extension (technical guidance) complement.

- Welcome to **R. Dwayne Elmore**, the new Extension Wildlife Specialist at OSU. One of Dwayne's jobs is to take the results of research to potential users of the information, including conservationists, hunters, ranchers, farmers, and other landowners. Contact Dwayne at dwayne.elmore@okstate.edu.
- Watch for the appearance of ***Texas Quail*** edited by Lenny Brennan, Caesar Kleberg Wildlife Research Institute, Texas A&M University-Kingsville. The expected publication date is 2007 (Texas A&M University Press). This giant book covers bobwhites, scalies, Montezuma quail, and Gambel's quail in Texas.
- ***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 $20, including shipping and handling. The book is in its second printing and available only in paperback.
- ***The Technology of Bobwhite Management—The Theory Behind the Practice*** by Fred S. Guthery (Iowa State University Press, 2002) is out of print and no longer available.
- ***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 Natural Resource Ecology and Management.

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 Natural Resource Ecology and Management, 008C Ag Hall, Oklahoma State University, Stillwater, OK 74078. Contributors receive *Quail News* and *Quail Flash*.