A detailed illustration of a quail, likely a Texas quail, perched on a weathered wooden post. The bird is shown in profile, facing right, with its beak slightly open. It has a distinctive crest of dark feathers on its head and a patterned body with dark spots and streaks. The background is a soft, hazy landscape with rolling hills and some sparse vegetation under a pale sky. The overall style is that of a classic wildlife illustration.

# The Upland Game Bird Management Handbook for Texas Landowners

TEXAS  
PARKS &  
WILDLIFE

Produced by The Texas Parks and Wildlife Department  
Small Game and Habitat Assessment Program

# The Upland Game Bird Management Handbook for Texas Landowners

Produced by The Texas Parks and Wildlife Department  
Small Game and Habitat Assessment Program



4200 Smith School Road  
Austin, Texas 78644  
[www.tpwd.state.tx.us](http://www.tpwd.state.tx.us)

# Compiled Under the Direction of the Texas Quail Council and the Game Bird Advisory Board:

Tim Connolly  
Chairman, Texas Quail Council

Billy Osborn  
Chairman, Game Bird Advisory Board

## Contributors:

Steven Bender, Vernon Bevill, Larry Butler, Steve DeMaso, David Forrester,  
Jason Hardin, Gary Homerstad, Robert Perez, David Riskin, Dale Rollins,  
T. Wayne Schwertner, Gene Miller, Jay Whiteside, and Heather Whitlaw

Cover illustration by Orville Rice; graphic design and layout by Tim Peterson;  
editorial review by Karen Blizzard

# LIST OF ACRONYMS

CCRP	Continuous Conservation Reserve Program
CP-33	Conservation Practice 33 (Habitat Buffers for Upland Birds)
CRP	Conservation Reserve Program
CTA	Conservation Technical Assistance Program
EQIP	Environmental Quality Incentive Program
FIP	Forestry Incentive Program
FSA	Farm Service Agency
LPC	Lesser Prairie Chicken
LPCCI	Lesser Prairie Chicken Conservation Initiative
LRGV	Lower Rio Grande Valley
LWRCRP	Land and Water Resources Conservation and Recreation Plan
NBCI	Northern Bobwhite Conservation Initiative
NRCS	Natural Resources Conservation Service
NWSG	Native Warm Season Grass
NWTF	National Wild Turkey Federation
PLS	Pure Live Seed
QU	Quail Unlimited
SAF	Society of American Foresters
SEQSG	Southeast Quail Study Group
TPWD	Texas Parks and Wildlife Department
TQC	Texas Quail Council
TQCI	Texas Quail Conservation Initiative
TTT	Trap, Transport, and Transplant
UGBC	Upland Game Bird Council
USDA	United States Department of Agriculture
WHIP	Wildlife Habitat Incentive Program
WMP	Wildlife Management Plan
WRP	Wetlands Reserve Program

# TABLE OF CONTENTS

I. Overview and Introduction . . . . .	2
II. The Upland Game Birds of Texas . . . . .	5
III. Conservation Challenges . . . . .	14
IV. Upland Game Bird Conservation Today . . . . .	18
V. What Are the Incentives for Game Birds in Texas? . . . . .	21

# APPENDICES

A. Habitat Management in Different Landscapes . . . . .	25
i. Grasslands . . . . .	25
ii. Agricultural Cropland . . . . .	28
iii. Southern Pine Forests . . . . .	29
B. TPWD Wildlife Regions and Districts . . . . .	32
C. Contact Information for Game Bird Conservation Partners . . . . .	33
D. Books and Other Game Bird Information . . . . .	34
E. Web Sites with Game Bird Information . . . . .	38
F. Background Information for Habitat Evaluation . . . . .	39
G. Eastern Wild Turkey Habitat Evaluation Guide . . . . .	40
H. Quail Management and Survey Information . . . . .	42
I. Rio Grande Wild Turkey Management and Survey Information . . . . .	51

# I OVERVIEW AND INTRODUCTION

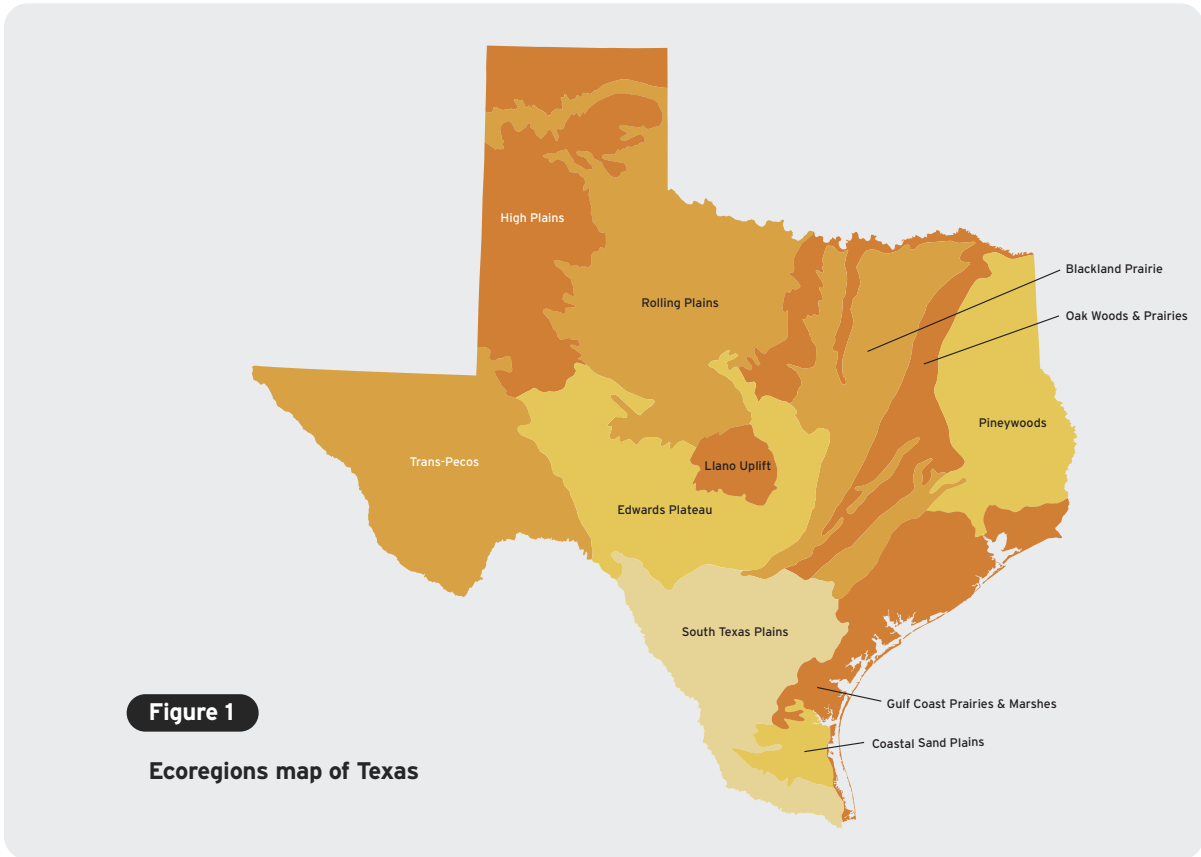
## **Purpose**

This handbook is a template for landowners, land managers and Texas Parks and Wildlife Department (TPWD) staff to use to implement the Texas Quail Conservation Initiative (TQCI), the Lesser Prairie Chicken Conservation Initiative and other landscape-level, habitat-driven game bird conservation efforts.

This handbook provides information regarding the current status and distribution of game birds in Texas and describes the challenges facing game bird conservationists today.

This handbook also outlines game bird habitat incentives available to landowners and land managers and describes how these incentives tie into the Joint Venture approach to integrated bird management.

The appendices of the handbook are designed to help land managers (1) understand game bird population and habitat management, (2) learn how to estimate game bird numbers, and (3) find sources of additional information about game birds.



**Figure 1**

**Ecoregions map of Texas**

**Introduction**

Texas is a diverse place! According to NatureServe’s 2002 *States of the Union: Ranking America’s Biodiversity*, Texas ranks second to California in terms of overall ecological diversity nationwide. It has the highest number of bird and reptile species and second-highest number of plants and mammals.

Texas is a large and ecologically complex state with deserts, mountains, hills, prairies, forests, caves, springs, rivers, wetlands and coastal habitats. Ecologists typically divide the state into areas with distinctly similar vegetation, climate, geology and soils. These readily identifiable ecoregions are pictured in Figure 1.

The conservation of game birds and other wildlife species in Texas depends on landowners and land managers, who manage the majority of the important

habitats. *The Land and Water Resources Conservation and Recreation Plan* (LWRCRP, 2005) (Figure 2) was written to guide the Texas Parks and Wildlife Department in conserving the state’s natural and historic heritage and in providing public access to the outdoors. The LWRCRP specifically addresses conservation of land and water resources. It also establishes priority habitat types and ecoregions based on the conservation status, potential and realized threats, and biological value. The suite of game birds that can be found in Texas occupy almost every priority habitat type in Texas.



**Figure 2**

**TPWD’s Land and Water Resources Conservation and Recreation Plan**

The “managed lands” approach to game bird management in a mostly privately owned state directly contributes to the ultimate goals outlined in the LWRCRP.

A recurring theme in the LWRCRP is the need to improve water resources. This handbook refers to incentives and technical assistance that could enable private landowners to improve water quantity and quality through enhanced range management primarily targeted at

benefiting wildlife. When habitat is improved for game birds, other species that have similar habitat requirements benefit as well (Figure 3). This, in turn, benefits the overall health and functionality of Texas ecosystems.

**The entire LWRCRP document can be viewed online at:**

[http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd\\_pl\\_e0100\\_0867.pdf](http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_pl_e0100_0867.pdf)

« web link



Red-cockaded Woodpecker

Texas Horned Lizard

- Short-eared Owl
- Common Nighthawk
- Eastern Kingbird
- Loggerhead Shrike
- Brown Thrasher
- Blue-winged Warbler
- Prairie Warbler
- Eastern Towhee
- American Tree Sparrow
- Field Sparrow
- Savannah Sparrow
- Grasshopper Sparrow
- Henslow's Sparrow
- Dickcissel
- Eastern Meadowlark
- Painted Bunting
- Chuck-wills Widow
- Red-cockaded Woodpecker\*
- Brown-headed Nuthatch
- Bachman's Sparrow
- Lesser Prairie-Chicken
- Attwater's Prairie Chicken\*
- Northern Harrier
- Texas Horned Lizard
- Texas Tortoise
- Prairie Dog
- Black-footed Ferret\*

\*Endangered

**Figure 3**

Many species (such as those listed in this figure) rely on the same grassland and savannah habitat types that some game birds use. The species listed here are all considered to be declining due to habitat loss.



## II THE UPLAND GAME BIRDS OF TEXAS

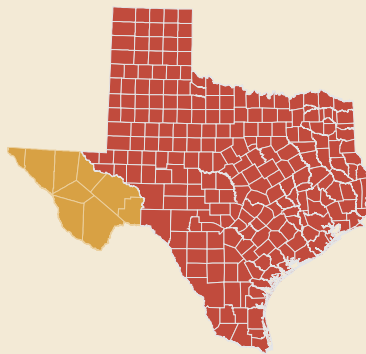


### Northern Bobwhite

*Colinus virginianus*

**Identification:** Bobwhites are the most popular and abundant quail found in Texas. Both sexes have a mottled brownish back and wings. Cocks have a white throat and face, while hens have a buff-colored throat and forehead stripe. Their familiar call says "bob-white."

**Habitat:** Mixed brush and grassland habitat types are most characteristic for bobwhites. Brushy rangeland interspersed with bunch grasses and cactus, stream courses and flood plains dotted with croplands offer prime habitat. In eastern portions of its Texas range, pine or oak savannah and coastal prairie that is burned frequently (every three to five years) and properly grazed become important. In drier portions of its Texas range, grazing and brush management become important management tools. Distribution is shown in red.



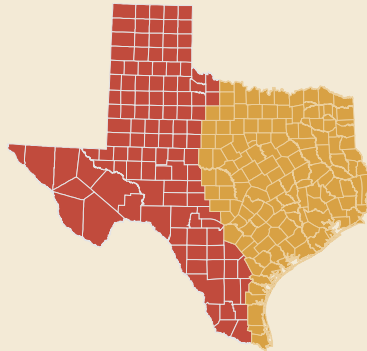


## Scaled Quail

*Callipepla squamata*

**Identification:** Scaled quail (often called “blue quail” in Texas) have a bluish-gray coloration over most of their body. Scaled quail are known for their habit of running from danger rather than flying. They are found in the western one-third of Texas. The named “scaled quail” comes from the scale-like feathers on the breast. The “cottontop” (white crest) is also a distinguishing characteristic of this species. The sexes look similar; however, hens tend to have faint, brown streaks running vertically down their throats.

**Habitat:** Scaled quail are usually found in semiarid rangelands characterized by a mixture of shrubs, grass and bare ground. Mesquite, prickly pear and sparse grasses are common habitat components. Distribution is shown in red.



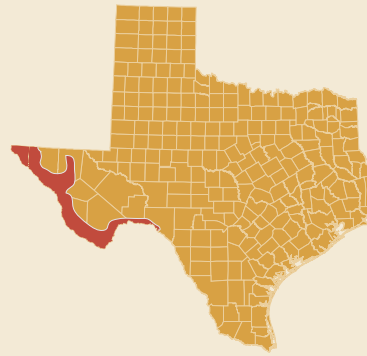


## Gambel's Quail

*Callipepla gambelii*

**Identification:** Gambel's quail are characterized by black, teardrop-shaped plumes, but no scale pattern on their abdomens. Cocks have a rusty crown and a black forehead, throat and abdomen. Hens have a smaller plume and no black throat or abdomen, but may have brown streaks on their underside.

**Habitat:** Gambel's are associated with brushy drainages along the Rio Grande from the Big Bend region to El Paso. Mesquite, acacia and mimosa species are used for cover and feeding sites. Gambel's quail are often seen on the ground and roost in trees. Distribution is shown in red.



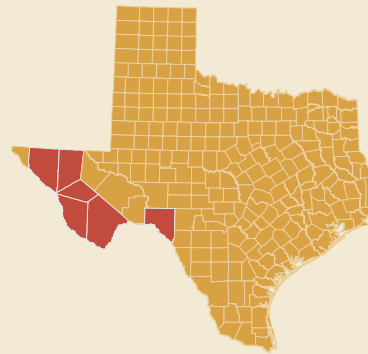


## Montezuma Quail

*Cyrtonyx montezumae*

**Identification:** Also known as Mearn's, Harlequin, or fool's quail, cocks have a striking harlequin or "clown face" pattern of white patches separated by black streaks, black breast and undersides, white or cinnamon colored spots on their flanks, and a grayish-brown back and wings. Hens have a cinnamon body coloration with black flecks, and a whitish chin and throat.

**Habitat:** The Montezuma quail routinely digs for its food, which consists of small bulbs and tubers. Montezuma quail inhabit the pine, oak and juniper grasslands of southwest Texas. While considered a game bird in Texas, there is no open hunting season for Montezuma quail in Texas. Distribution is shown in red.



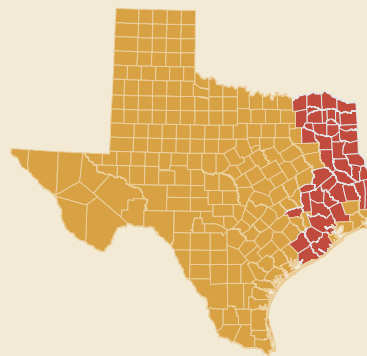


## Eastern Wild Turkey

*Meleagris gallopavo silvestris*

**Identification:** The upper tail coverts of adult males (gobblers), which cover the base of the long tail feathers, are tipped with chestnut brown and its tail feathers are tipped with dark buff or chocolate brown. In contrast, its breast feathers are tipped in black. Rich, metallic, and copper/bronze iridescence characterize other body feathers. At a distance however, gobblers look almost black. Hens (adult females) are similar in color to the males but more brown, and the metallic reflections are less brilliant. Feathers of the hen's breast, flanks and sides are tipped with brown rather than the black and white tips of the male.

**Habitat:** Mainly found in deciduous or pine forests mostly in east Texas. Range has increased in Texas as a result of TPWD restoration efforts in conjunction with conservation partners including the National Wild Turkey Federation. Distribution is shown in red.





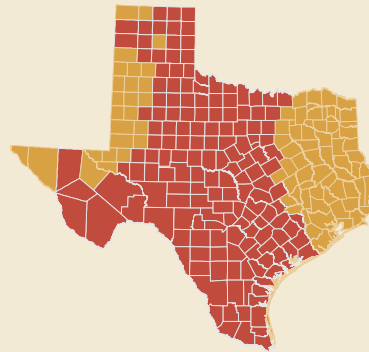


## Rio Grande Wild Turkey

*Meleagris gallopavo intermedia*

**Identification:** The Rio Grande wild turkeys are comparatively pale and copper colored. They are distinguished from the eastern subspecies by having tail feathers and tail/rump coverts tipped with a yellowish-buff or tan color rather than medium or dark brown. Although there has been more variation in the shade of buff/brown in the tail feathers among Rio specimens, the color is consistently lighter than that found in the eastern subspecies. Hen feathers of the breast, sides and flanks are tipped with pale pinkish buff.

**Habitat:** The Rio Grande wild turkey inhabits riparian areas and mesquite or scrub oak forests. Suitable roosting cover is important for successful populations. Distribution is shown in red.



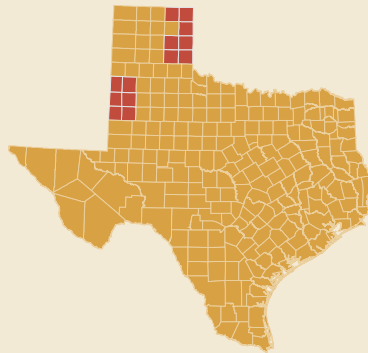


## Lesser Prairie Chicken

*Tympanuchus pallidicinctus*

**Identification:** Adult lesser prairie chickens (LPC) average 15 to 16 inches in length. They have a feather pattern of crosswise bars of brown, buff, blackish and white coloration. Elongated “ear” feathers called pinnae are erect during mating displays, and are located on the neck. Below the pinnae on males are reddish, featherless areas of skin called gular air sacs. These sacs are inflated during mating displays. In addition to the pinnae and air sacs, the LPC has a conspicuous bright yellow eye comb above each eye. Eye combs are the most prominent on males.

**Habitat:** The LPC inhabits shrub-grassland communities composed of sand shinnery oak or sand sagebrush with an understory composed of mixed-grass or tallgrass species and a variety of forbs. However, the amount, structure, and patterns of sand shinnery oak or sand sagebrush needed as LPC habitat continue to be active areas of research. LPCs use varying heights, densities and species of vegetation in accordance with their seasonal life-history requirements. Harvested grain sorghum and corn fields may be used as winter foraging areas. Distribution is shown in red.



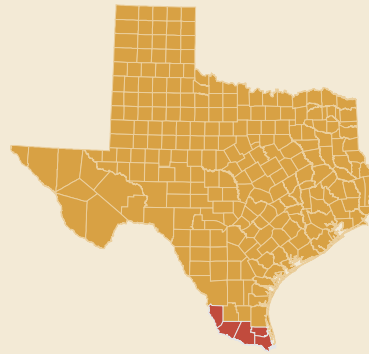


## Plain Chachalaca

*Ortalis vetula*

**Identification:** Plain chachalacas are about the size of a small crow. The body is olive-brown, with a long tail glossed with green and a white tip. The head is slightly crested, with patches of bare, pinkish-red skin at the sides of the throat. Males and females are similar.

**Habitat:** Dense thorn scrub and riparian woodland habitats throughout the Rio Grande Valley define the northernmost limit of the chachalaca's distribution. This species is more common in Mexico. Distribution is shown in red.



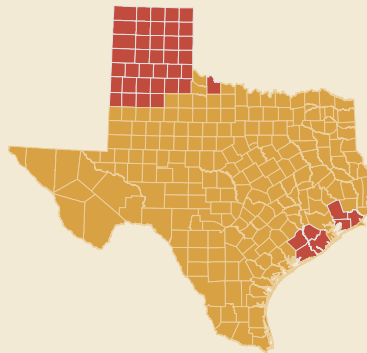




## Ring-necked Pheasant

*Phasianus colchicus*

**Identification:** Cocks (adult males) are characterized as a composite of a copper breast merging into russet brown sides; rich brown flecked with bars of black and white covers most of the rest of the body. The lower back and rump are a bluish gray with a greenish tinge. There is usually a white ring around the neck, but not always. Above the ring, the neck and head are an iridescent black with olives, violets and greens flashing through. There is often a gray patch on the crown of the head. A sizable crimson red patch covers the area around the eyes and the wattles. The tail is long, brown and barred with black. The legs on adult males possess spurs. The drab hens are a fairly uniform brown color with buff and black markings on the feathers. The undersides are light buff or cream colored with some faint mottling. The tail is about half as long as the tail on males.



**Habitat:** Although pheasants are an introduced species, they remain an important game bird in the Texas Panhandle. Pheasant habitat requirements are best provided with diverse farming practices including lands enrolled in the Conservation Reserve Program. However, the presence of areas such as marshes, potholes, non-agricultural areas, railroad right-of-ways, unmowed roadsides, drainage ditches, grass waterways, weedy brushy draws, ravines, and other idle lands with plant growth increase the value of the land as pheasant habitat. Distribution is shown in red.

## III CONSERVATION CHALLENGES

### Understanding Complex Natural Systems

Nature changes so gradually that people usually don't notice. People tend to assume that the way landscapes look today is "normal" and the way they should look. A Chinese tallow forest on the Texas Coast is assumed to be "natural" by most people, and this causes little concern. The relatively rapid ecological transformation from a coastal prairie to a scrub forest of exotic trees in a couple of decades causes a huge impact on native wildlife. Similar ecological transformations have taken place across Texas. These transformations have created many challenges for Texas game birds (Figure 4).

Although culprits such as roadrunners, raccoons, cattle egrets, skunks, hawks, weather, and especially fire ants are often blamed for the demise of game bird populations, **the fundamental reason for declining game bird numbers is loss of habitat.** While predation can certainly influence game bird populations, impacts of predation increase as areas of habitat get smaller and are separated by longer distances. Local populations of game birds on these islands of habitat are too few in number and too far from other game bird populations to withstand catastrophic events such as floods, snow and ice, drought, etc. Therefore, isolated populations of game birds have a greater possibility of becoming locally extinct.



### Conservation Challenges Identified

There are many challenges to managing wildlife habitat and plant communities in the state; some are specific to particular ecoregions, while others occur statewide. Of course, landscapes do not change overnight. For more than a century, the lands that game birds historically occupied in Texas have been undergoing a gradual alteration by human actions (fire suppression, changing farming practices, timber and rangeland management practices, and an increasing human population). An excellent resource that shows just how landscapes have changed is the book ***Texas Natural History: A Century of Change (2002)*** by David J. Schmidly.

Figure 4

A photo of an open savannah (top) compared to a photo of a closed-canopy forest (bottom).

«book

The following section describes the general challenges to game bird habitats statewide.

## Changing Demands on Land Resources

Projected population growth and habitat fragmentation, or the division of single ownership properties into two or more parcels, have had profound effects on game bird habitat and the landscape. Conversion of natural habitats threatens the viability and sustainability of game bird populations. For example, the Texas A&M publication *Fragmented Lands: Changing Land Ownership in Texas* (Wilkins et al. 2000), reports that the conversion of rural land to urban use in Texas exceeded 2.6 million acres from 1982 to 1997. Such changes have already affected game bird populations, habitats and distributions throughout the state, especially near metropolitan areas.

Fragmentation poses a serious threat to wildlife habitat. In general, smaller properties provide less diversity of habitat types and less usable space to support game bird populations. Many other factors cause a decrease in game bird populations, such as the presence of people, dogs, cats and other disturbances. In some cases, as landholdings become smaller than 500 acres, property owners tend to convert native rangeland to improved pasture if an increase in forage is desired for livestock or horses, thus reducing game bird habitat. The intensity of use on such areas usually increases, as landowners have historically had to maintain some degree of “ag use” to maintain an open-space or ad valorem valuation. Other small property owners may totally remove grazing animals from their lands, thus also reducing game bird habitat due to excessive vegetation.

**Note: Open-space valuation can be maintained by managing for wildlife, including game birds. See the TPWD Web site:**

[http://www.tpwd.state.tx.us/conserve/private\\_lands/agricultural\\_land](http://www.tpwd.state.tx.us/conserve/private_lands/agricultural_land).

web link »



**Improper grazing can be devastating to the production of game birds.**

## Grazing

Grazing is included as a challenge because it must be planned and applied properly to benefit game bird habitat. Grazing by domestic livestock is a tool for game bird habitat management on rangelands and other grasslands. As with any tool, it can be used properly or improperly.

Grazing intensity, timing, duration, and class of livestock must be prescribed for a specific property to accomplish the desired goal(s) of management. The landowner, wildlife biologist and a rangeland management specialist should work together to design and implement a prescribed grazing plan that will improve the game bird habitat. An inventory of the current conditions is absolutely necessary in order to plan the appropriate grazing plan. Land that has been severely overgrazed may need total rest from grazing for a period of time prior to developing a sustainable grazing plan. Land that has not been grazed and has a buildup of too much vegetative material may need to be heavily grazed or burned prior to developing a sustainable grazing plan. Grazing can be planned and implemented to



**Prescribed fire, proper grazing and brush management are important tools used to create and maintain good bird habitat.**

manipulate the vegetative community in a way that favors the growth of desired plants that are essential for game bird habitat.

Grazing can be a double-edged sword when managing rangelands for game birds and other wildlife. When the right amount of grazing is combined with adequate rainfall, game birds can greatly benefit. Too much grazing—along with too little rainfall and too much hot weather—can be devastating to the production of game birds. Improper grazing management (too many livestock for too long a period and/or at the wrong time of year) results in decreased diversity in wildlife forage, cover and other wildlife needs. The impacts are exacerbated during times of drought if stocking rates are not reduced in time to protect wildlife cover. Accordingly, the landowner interested in maintaining good game bird habitat should work with a rangeland management specialist to develop a prescribed grazing plan with a stocking rate that can be adjusted depending on plant growth conditions.

When rangeland soils are disturbed, varieties of plants that are favorable to game birds respond. Many bird species relish seeds from

species such as croton and western ragweed, which are among the first types of plants to emerge after a disturbance. Grazing can encourage the growth of such preferred plants. Grazing can also be used to promote a desirable habitat structure for many bird species at ground level. Most game bird species prefer areas with some bare ground. Care must be taken not to promote long-term overgrazing that could change the composition, species diversity and structure of vegetation by eliminating tall bunch grasses. The tall bunch grasses provide quality nesting cover, the lack of which is the most widespread limiting factor in game bird production across most of Texas.

## **Fire**

Fire is much like grazing in that it must be applied properly to benefit game bird populations. Fire can be used to manipulate the vegetative community on the landscape, creating a mosaic of habitat types and more usable space for game bird populations. The planned use of fire—“prescribed burning”—can be a useful and inexpensive tool for game bird management, considering that most game birds will not thrive in areas





**Forests with a high density of trees and undergrowth, and exotic grasses such as Bermuda, do not provide usable habitat for quail.**

where the proportion of brush-woodland forest exceeds 50 percent of available cover. One of the challenges resource managers face is the conservation of fire-dependent ecosystems in the face of ever-increasing urbanization and land fragmentation. Although fire plays a bigger role in shaping game bird habitat in higher rainfall zones, much of Texas can be considered a semi-arid environment where even historic fires were infrequent. In these areas, however, fire remains an important tool in the maintenance of open areas created by mechanical or chemical methods (Frost 1998, Guthery 2000). Only trained and properly equipped individuals should plan and implement a prescribed burn.

### **Noxious Plant Species**

Undesirable or noxious brush and woody plant species such as mesquite, salt cedar, Chinese tallow, Russian olive, red-berry juniper, Ashe juniper, yaupon and condalia can become so numerous that they begin to compete with the grassland community for water and space. In this situation, livestock forage and the production of native grasses used by game birds can become limited. Although many of these invasive woody plants are native, they have increased in abundance to such a degree that many



grassland and savannah species can no longer use much of the landscape they formerly occupied. Through the use of improved range management techniques, e.g., “brush sculpting” (Rollins et al. 1997), these species can be significantly reduced or controlled to benefit water quality and quantity and also help restore native grasses that benefit game birds and other wildlife, as well as livestock.

### **Introduced Grasses**

Introduced grass species such as coastal Bermuda and bahia can create monocultures devoid of quality game bird nesting cover, brood-rearing cover and feeding areas. Monocultures tend to limit insect availability, which greatly reduces the value of these areas for young game birds. For some ground-dwelling birds, like quail, these dense turf-type grasses cannot be traversed by young chicks. Species such as weeping lovegrass, Lehman’s lovegrass, guinea grass and buffel grass—introduced bunch grasses—provide limited nesting cover, especially during drought years, but can reduce overall plant diversity and make finding food more difficult for seed- and insect-eating birds, like quail and turkey.

## IV UPLAND GAME BIRD CONSERVATION TODAY

### What Is Being Done for Upland Game Birds?

Currently, there are numerous national, regional and state planning efforts to address the plight of game birds, as well as other species who share their habitats. Below is a brief summary of some of those efforts.

#### Northern Bobwhite Conservation Initiative (NBCI)

The NBCI was prepared by the Southeast Quail Study Group Technical Committee at the request of the directors of the Southeastern Association of Fish and Wildlife Agencies. The charge issued to the committee was to develop a quantitative habitat-oriented plan to restore bobwhites to the density they enjoyed during the baseline year 1980. The NBCI is organized to delineate population and habitat objectives for 15 Bird Conservation Regions across 22 states that comprise that portion of the bobwhite's range incorporated in the plan. This approach was selected to facilitate coordination and cooperation with other bird management plans, e.g., Partners in Flight. The NBCI also includes three chapters detailing specific management practices to be employed on agricultural land, grasslands and forests, and one chapter outlining the approaches to be taken to implement the plan. For more information about the NBCI, visit:



web link >>

<http://www.seqsg.org>



TEXAS QUAIL INITIATIVE  
Texans Improving Habitat for Native Wildlife

#### Texas Quail Conservation Initiative (TQCI)

The initiative is a step-down version of the NBCI which was prepared by the Southeast Quail Study Group (SEQSG) Technical Committee. The TQCI includes northern bobwhite, scaled quail, Gambel's quail and Montezuma quail. However, due to a lack of basic population and ecological information regarding Gambel's and Montezuma quail in Texas, population goals and habitat objectives are not included for these two species. The TQCI plan includes three chapters that detail specific quail habitat management practices to be used on agricultural land, grasslands and forests, and one chapter outlining the approaches to be taken to implement the TQCI. Implementation strategies for the TQCI include outreach and training needs, management needs, research needs, and funding needs and sources. For more information about the TQCI, visit:

[http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd\\_rp\\_w7000\\_1025.pdf](http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_rp_w7000_1025.pdf)

<< web link



### **National and Texas Wild Turkey Plans:**

The National Wild Turkey Federation (NWTF) is currently developing a National Wild Turkey Strategic Plan. The plan, developed by the Federation's biologists, in cooperation with federal and state wildlife biologists from across the nation, will focus on issues of national concern including habitat conservation, nuisance turkey issues, population management and restoration, and disease issues. The Texas Parks and Wildlife Department's Wild Turkey Taskforce includes TPWD staff and NWTF state representatives who are working together to develop a similar plan to address wild turkeys in Texas.

**Texas Lesser Prairie-Chicken Conservation Initiative (LPCCI):** The Texas LPCCI is an effort to develop a state-level management and conservation strategy for LPCs in Texas. It was developed concurrently with the Interstate LPC Conservation Strategy and the National Prairie Grouse Plan. In its current form, the Texas LPCCI has a stated goal to manage, conserve and enhance LPC populations and habitat in the Rolling Plains and High Plains ecological

regions of Texas. The Conservation Initiative will address statewide issues and strategies related to population numbers and distribution, habitat quality and quantity, private lands concerns, regulations, outreach and education, and research needs.

### **How Do These Plans and Initiatives Get Put on The Ground?**

Today, most conservation challenges are daunting! They require a landscape-scale approach built on partnerships among wildlife agencies, conservation organizations and private landowners. They have large price tags and require a lot of work. In addition, when the challenge is habitat-based, it may take some time to see the results and the final product. Joint Ventures (JVs) are a way to address some of these large conservation challenges and integrated bird conservation because they are partner-based initiatives capable of dealing with multiple species at landscape scales.



A JV is a regional, self-directed partnership of government agencies and non-governmental organizations, as well as individuals. Joint Ventures deliver science-based conservation and work in support of national and international bird conservation plans. Joint Ventures are directed by a management board made up of partner representatives. Joint Venture partners are dedicated to the conservation of habitats within their region. There are many levels of participation, ranging from membership on the management board to participation with technical teams and working groups. Joint Ventures are an effective bird conservation tool throughout much of North America. Joint Venture partners work cooperatively to obtain data needed on bird populations and habitats. By providing more information about the resource, land managers and landowners can make better decisions. Working with partners avoids repetitive efforts and allows funding from multiple sources to be combined, increasing the size and scope of work that can be accomplished.

This approach to conservation requires that site-scale management decisions reflect multi-scale management considerations. Incentives can be an important tool that drives site-scale (i.e., a landowner's property) management decisions. When these incentives are delivered in a focused area approach, we are fulfilling habitat goals for larger scales. Therefore, incentives that allow landowners flexibility and a means of improving the quantity and quality of habitat on their lands are a means to increase landowner participation and deliver conservation at the site-specific scale. In essence, the landscape is tied together across multiple ownerships. The Joint Venture is a perfect delivery approach to help build and work with wildlife cooperatives.

## How Incentive Programs Can Help Upland Game Birds



The idea of incentives programs started out as a “reward” program for landowners practicing good

management. After the first couple of years, the TPWD Commission and leadership clearly and repeatedly stated that the managed lands program is an “incentive-based” and “habitat-focused” program. It is obvious that incentives within the program have significantly increased landowner participation in this program. This is good. This program needs more incentives. The managed lands program incentives have resulted in a significant increase in the number of landowners who want to participate in the managed lands program. However, if it weren't for the incentive-driven interest, some landowners would still be out there on their own with no contact with TPWD staff or its conservation partners, getting no information; or, even worse, getting bad information about managing the wildlife on their properties. More landowners talking to and visiting with TPWD wildlife biologists and technicians and their conservation partners across Texas is a **VERY GOOD THING!**

As we move forward in our efforts to restore game bird populations, it is important to keep in mind that it will take years or perhaps decades to build the partnerships, research and projects needed to ensure that game birds are still around in the next century.



# V WHAT ARE THE INCENTIVES FOR GAME BIRD MANAGEMENT IN TEXAS?

## Assistance in Developing Game Bird Cooperatives

**Purpose:** To allow landowners, especially with smaller landholdings, to combine properties and partner to improve habitat quantity and quality to manage viable game bird populations and other wildlife. Perhaps the single most important long-term step that can be taken to improve game bird management across landscapes will be the development of game bird cooperatives

### Incentives for Developing Cooperatives:

- Assistance from TPWD staff and conservation partners in developing game bird cooperatives.
- Trap, Transport, and Transplant (TTT) permit, if needed and permit requirements have been met. See Appendix H for Quail and/or Appendix I for Rio Grande Turkey.

### Requirements:

- Recommended minimum acreage of ~1,000 acres (3,500 acres preferred ) of combined potential habitat space
- TPWD wildlife management plan prepared or certified by a TPWD biologist.
- Meet the TTT requirements in Title 31, Part 2, Chapter 65, Rule §65.103 of the Texas Administrative Code.

### Responsibilities:

- Conduct an evaluation of the habitat using a standardized procedure (conservation partner or TPWD biologist

and landowners). See Appendices B and C. See examples in Appendices F, G, H and I.

- Develop a wildlife management plan (written or certified by a TPWD biologist). See examples in Appendices H and I.
- Implement the priority habitat management practices recommended in the wildlife management plan. These practices can be phased in based on existing conditions as guided by the biologist (landowners).
- Train landowners in properly conducting fall and spring (if required) population monitoring (conservation partner or TPWD biologist). See examples in Appendices G and I.
- Conduct fall and spring (if required) population monitoring. Initial counts will be made with a conservation partner or TPWD biologist (landowners). See examples in Appendices G, H and I.
- Assist landowners in analysis and interpretation of fall and spring (if required) population data (conservation partner or TPWD biologist and landowners). See examples in Appendices H and I.
- Verify that priority habitat work has been accomplished and habitat response is in place (conservation partner or TPWD biologist).
- Determine if a TTT is needed, second year post-habitat work (TPWD biologist). (If base population is not present or does not find its way to the property in question, a TTT may be considered).

## Leveraging Landowner Dollars for Habitat Work

**Purpose:** To use the Federal Farm Bill Programs to financially assist landowners in implementing game bird friendly habitat practices on their properties.

### Incentives for Leveraging Dollars for Habitat Works:

- Assistance from TPWD staff and/or a conservation partner in finding and understanding which cost-share programs might be most feasible in implementing the habitat work needed on the property. This can be done through publications, Web sites and workshops.

### Natural Resources Conservation Service (NRCS) Programs

The NRCS has many cost-incentive programs available for landowners. For a better picture of what's available and where, see the NRCS Web site or visit with your county USDA-NRCS office. Examples of programs that can be used to benefit wildlife include the Environmental Quality Incentives Program (EQIP), Wildlife Habitat Incentive Program (WHIP), Wetlands Reserve Program (WRP) and the Conservation Technical Assistance (CTA) Program. The CTA in particular provides technical assistance supported by science-based technology and tools to help people conserve, maintain and improve their natural resources.

Due to the complexity of the programs mentioned above, landowners are encouraged to visit their local NRCS offices or Web site:

<http://www.tx.nrcs.usda.gov/programs/CSP/>

« web link

### Farm Services Agency (FSA) Programs

Conservation Reserve Program (CRP) signups are held at irregular intervals. CRP requires establishment of a permanent cover on highly erodible farm land. Such cover normally consists of a mix of warm-season grasses and forbs, potentially ideal game bird habitat. Contracts last 10 to 15 years and provide 50 percent cost-share for establishing cover and yearly rental and maintenance payments. Recent contracts also provide cost-share for midcontract management practices such as burning, disking and shrub planting that can increase CRP's habitat quality for game birds.

The Continuous Conservation Reserve Program (CCRP) is open to landowners of working lands year round. There are a variety of practices such as filter strips, field borders, riparian buffers and others that can be very beneficial to game birds.

## **Trap, Transport and Transplant (TTT) Permits for Bobwhite Quail, Scaled Quail, and Rio Grande Wild Turkey**

**Purpose:** To facilitate introduction of bobwhite quail, scaled quail, and Rio Grande wild turkeys into unoccupied, suitable habitat, where the probability of natural colonization by these species has proven to be low.

### **Requirements:**

- Recommended minimum acreage of 1,000 (3,500 preferred) acres for quail and 5,000 (10,000 preferred) acres for Rio Grande turkey, of potential usable habitat space.
- Recommended minimum habitat acreage may occur on multiple landholdings, whether these holdings are enrolled in the program or not, but must be functionally contiguous (i.e., containing no gaps across which a quail and/or wild turkey would not be reasonably expected to disperse).
- Cooperatives are eligible for TTTs if they meet the program requirements.
- No hunting for a minimum of three years for quail and five years for turkey, and thereafter determined by annual evaluations, with the local TPWD biologist making the “hunt” or “not to hunt” decision.
- TPWD wildlife management plan prepared or certified by a TPWD biologist.
- Meet the TTT requirements in Title 31, Part 2, Chapter 65, Rule §65.103 of the Texas Administrative Code.

### **Responsibilities:**

- Conduct an evaluation of the habitat using a standardized procedure (conservation partner or TPWD biologist and landowners). See Appendix C for Conservation Partners. See examples in Appendices G, H and I.
- Develop a wildlife management plan (written or certified by a TPWD biologist). See examples in Appendices H and I.
- Implement and establish the priority habitat management practices recommended in the wildlife management plan. These practices can be phased in based on existing conditions as guided by the biologist (landowners).
- Train landowners in properly conducting fall and spring (if required) population monitoring (conservation partner or TPWD biologist). See examples in Appendices G, H and I.
- Conduct fall and spring (if required) population monitoring. Initial counts will be made with a conservation partner or TPWD biologist (landowners). See examples in Appendices G, H and I.
- Assist landowners in analysis and interpretation of fall and spring (if required) population data (conservation partner or TPWD biologist and landowners). See examples in Appendices H and I.
- Verify that priority habitat work has been accomplished and habitat response is in place (conservation partner or TPWD biologist).
- Determine if a TTT permit is needed, second year post-habitat work (TPWD biologist). (If base population is not present or does not find its way to the property in question, a TTT may be considered).

## Game Bird Stewardship Program

This incentive is non-competitive and can be recommended for any number of properties in a given year to show appreciation for a job well done in managing game bird habitat. If implemented by one or more NGOs, this program can better connect the NGOs to conservation on the ground in Texas.

**Purpose:** To recognize landowners who are doing an outstanding job of managing game birds on their properties.

### Requirements:

- Have a TPWD-approved wildlife management plan that focuses on or includes one or more Texas upland game birds (quail, turkey, ring-necked pheasant, lesser prairie chicken and chachalaca).
- The landowner must be implementing the recommendations in the above wildlife management plan.

### Implementation:

- TPWD field staff will deliver the signs to cooperating landowners who are meeting the requirement of the program, as stated above.

## Habitat Management Equipment Incentive

**Purpose:** To put landowners in touch with persons who have the equipment and/or operate the equipment to conduct wildlife-related habitat work on the landowner's property.

- Compile contact lists for conservation easements, land trusts, habitat management, GIS/mapping, herbicides and other useful links.



**Audubon Texas has begun development on their Web site at:**

[http://www.tx.audubon.org/BSC\\_Landowner.html](http://www.tx.audubon.org/BSC_Landowner.html)

« web link

## Appendix A.

# HABITAT MANAGEMENT IN DIFFERENT LANDSCAPES (GRASSLANDS, CROPLAND, AND FORESTS)

### **Grasslands (Pasture/Hayland/Rangeland)**

#### **Ecology and Status**

Grasslands were important habitat for many game birds across their range in pre-settlement times. In the East, the grasslands were primarily savannahs, and in the Midwest and Great Plains, the vast native prairies sustained quail populations. Over the past 300 years, four factors added up to reduce the quality and quantity of these grassland habitats: (1) continuous grazing livestock operations of the new European settlers, (2) tallgrass prairie conversion to cropland, pasture and woodland, (3) fire suppression permitting woody invasion and, more recently, (4) the introduction of exotic grass species.

Native grasslands evolved with intermittent, intense grazing by bison and elk. Desert grasslands were maintained by infrequent natural fire (once every 13 to 25 years) and experienced very little natural grazing pressure. Native Americans periodically burned the grasslands, especially those in the east. The European settlers brought a different approach to husbandry that confined the livestock and introduced continuous grazing. This pattern reduced the vigor and shifted species composition to increasers, less palatable grasses and invaders, and opened the prairies to invasion by woody species.

On the Great Plains, fire suppression permitted a deterioration of the grasslands with shrub and cool season grass invasion. At first, the addition of shrubs to the prairies increased some game bird habitat and numbers, while decreasing others, such as the lesser prairie chicken and Attwater's prairie chicken. However, over time, intensive grazing combined with fire suppression brought about a decline in some game bird populations as brush and exotic cool season grasses increased; thus, the grasslands deteriorated as game bird habitat.

In the East and especially in the Midwest, prairie soils held outstanding crop production potential, and the vast majority of the prairies were converted to agricultural production, reducing some game bird habitat dramatically in the "corn belt," with pheasants being the exception. With the exception of a few prairies that existed over very shallow rock strata, these old prairies now produce the country's corn, milo and soybeans, not game birds and other grassland wildlife. Similar but less extensive conversion has occurred in midgrass prairies, where center-pivot irrigation has been developed.

Another change in the grasslands that has had a negative impact on game bird populations is the tremendous acreage of degraded grassland that has been reseeded to exotic forages, such as Bermuda grass, bahia grass, introduced bluestems, weeping lovegrass and a host of other exotic

forages. These are mostly dense sod-formers that produce habitat inhospitable to game birds. The conversion of crop fields, native pastures and hay meadows to the exotic grasses accelerated dramatically in the 1940s as tenant farmers moved to the cities, and landowners in many cases seeded the numerous small fields to exotic forage.

### **Grasslands as Game Bird Habitat**

During the last half of the 20th century, large areas of native Texas grasslands were converted to forest lands, plowed and added to adjacent cropland acres, or converted to or invaded by exotic forages. Where they still exist, native grasslands can be fine game bird habitat if they are large enough. However, a high percentage of these native grasslands have been lost or are in danger of becoming fragmented, isolated tracts of native grass. Conversion and fragmentation have rendered these former high-quality nesting and brood-rearing habitat almost useless to game birds. Most game birds have difficulty moving through this dense vegetation, where there are limited amounts of seeds and insects. Leading chicks to good brood-rearing cover takes a toll, as young chicks and poults struggle through this dense vegetation. As a consequence, hens typically select alternate nesting habitats, resulting in reduced nesting success and higher predation rates on chicks and poults.

Native warm-season grasses provide nesting and brood-rearing cover for game birds. Big bluestem, little bluestem, Indiangrass, switchgrass, broomsedge bluestem, tobossa, four-flowered trichloris, tanglehead and many grama grasses provide the vegetative structure that game

birds need to nest. These grasses grow in clumps interspersed with bare ground, which allow adult birds, chicks and poults to move about. Grass clumps should be 9 to 12 inches in diameter, and the residual growth in the center of the clump should be 16 to 18 inches tall. Most game birds nest in the residual grass in the center of a clump left from the previous growing season. Small-scale soil disturbances produce the forbs which provide food in the form of seeds and insects that are attracted to these areas.

### **Specific Problems**

- The suppression of fire from the landscape has been a major factor in the declining health of Texas grasslands and savannahs. Brush and exotic cool-season grasses have invaded these once-luxurious prairies, and closed canopy forests are devoid of an herbaceous layer.
  - o Prescribed burning, prescribed burning cooperatives, and the development of new burning laws for habitat improvement are potential solutions.
- Fencing permits more intensive, year-around grazing, which has dramatically reduced the condition of these pastures as increaser and invader species replace native grass plant communities. The native bunch grasses that characterized these prairies are gone or depressed, resulting in poor game bird habitat.
  - o In some areas of the state, newer grazing methods, such as patch-grazing, that promote mixed native plant communities, can be promoted through education and outreach and through the development of new incentives.

- Introduced forages such as Bermuda grass form a dense sod, which game birds, especially newly hatched chicks and poults, find difficult to travel through. They also support lower numbers of insects, which are a large component of game bird chick and poult diets.
  - o Research is underway to find cost-effective means to convert exotic pasture back to natives for landowners interested in wildlife habitat.
- High costs for fuel, fertilizer and machinery are encouraging ranchers to consider switching land from exotic grasses back to native perennial grasses.
- Grassland restoration is hampered by a lack of locally adapted native grass seed and proper planting equipment. Native grass/forb seed is often expensive and short in supply. Harvesting equipment for seed is also expensive and difficult to obtain. These create difficulties with obtaining sufficient appropriate native seed to meet the demands for CRP, grassed terraces, field/riparian borders, etc.
  - o Native plant organizations in a few areas of the state have begun to cultivate locally adapted varieties of native plants for sale and distribution to interested landowners. This greatly increases the chance of success for restoration projects.
  - o Some wildlife cooperative groups have recently launched programs to preserve remnant tracts and restore other, native pastures by providing technical help, equipment and native grass seed or hay.
- Native grasses and forbs take longer (up to three growing seasons) to establish than do agricultural crops and most exotic grasses. This has tended to give native grasses a poor reputation among ranchers in some parts of Texas.
  - o Research and demonstration can illustrate the benefits of a native plant community adapted to persist in harsh environments.
- Brush control operations tend to reduce the value of the grasslands to game birds by placing escape cover at excessive distances. Brush control in Texas has had mixed impacts on some species of game birds, depending on the approach taken.
  - o Newer approaches, such as brush sculpting, keep wildlife needs in the picture and can maintain plant diversity on the landscape.

#### **Grassland Aspects to Consider in Game Bird Management**

- Long, narrow strips of grasses are likely to offer less insulation against nest depredation than contiguous blocks/pastures of grasses.
- The inclusion of forbs in a native grass mix improves food (seed and insect) availability.
- Livestock forage planting rates (7 to 8 pounds of PLS/acre) are higher than rates where wildlife is the primary consideration (5 pounds of PLS/acre).
- Game birds nesting in residual grasses need adequate bare ground for movement.



- Livestock stocking rates and duration in pastures should leave at least 300 nest sites/acre to reduce depredation of nests.
- Burn frequency varies, but most native grasslands need to be burned every three to five years.
- Where annual rainfall is less than 25 inches, the lack of bare ground is rarely a factor in game bird management; appropriate stocking rates that leave enough native ground cover become more important.

### **Grazing and Game Bird Management**

- Where game bird management is intended to be a priority, it must be accepted that game birds and cattle may not be maximized concurrently on the same pasture.
- Grazing management should be used to maintain a density of approximately 300 basketball-sized clumps of bunchgrass per acre. Grass should be grazed to a height no lower than about 8 inches.
- Stocker calves have the potential to be more flexible than cow-calf operations when it comes to using grazing as a tool to maintain game bird habitat. Stockers allow for a way to quickly reduce the number of grazing animals at the onset of drought conditions.

## **Agricultural Cropland**

### **Ecology and Status**

Inefficient row crop agriculture, characterized by small weedy crop fields interspersed with fallow fields and frequently disturbed open canopy woodlands, once created an environment productive of early succession wildlife across the region. Technological advances during the 20th century

increased productivity and yields of farm commodities, but the value of cropland to wildlife has steadily decreased. Farming intensity continues to increase, with double cropping becoming more prevalent. At the regional level, land use for agricultural crops has been consolidated on the more productive soils. Field consolidation, surface and subsurface drainage, and hedgerow removal have reduced habitat interspersion and diversity at the field level. On an even smaller scale, plant community structure and plant and insect diversity have been reduced by chemical pesticides, faster-growing crops, and increased efficiency of harvest equipment. In contrast to the interspersion of complex plant communities characteristic of early agriculture, today's crop fields are for the most part true monocultures. Some game birds exist in some cropland situations; however, this is more the exception than the rule in landscapes dominated by cropland.

### **Cropland Types**

Cropland is devoted to the annual planting and harvesting of grains and other commodities. In certain instances, an annual rotation of different crops occurs on the same acreage, but continuous cropping of the same plant (e.g., corn) may take place for several successive years. One positive development is increased use of minimal-till and no-till planting for certain crops in recent years. Major crops of concern are corn, soybeans, cotton, peanuts, rice, sorghum and small grain (wheat, rye, barley, etc.).

Resources provided by commercial commodity crops sometimes provide important life requisites for game birds. However, natural early-succession habitat associated with field edges and fallow areas are essential game bird habitat in these agricultural landscapes.



### **Specific Problems**

- The trend toward larger field size through farm consolidation has decreased the value of cropland as game bird habitat. Larger and more intensively cropped landscapes have contributed to lower densities of game birds in intensively cropped areas because of reduced nesting and brood- and poult-rearing cover.
- The quality of nesting cover adjacent to or in association with cropped fields has declined drastically in recent years. The widespread use of introduced, aggressive grasses (e.g., fescue, bahia and Bermuda grass) that form dominant monocultures, frequent mowing, and forestry practices that result in closed canopy stands has aggravated this situation.
- Brood and poult habitat quality in cropland and remaining field borders has declined because of greater use of herbicides, changes in annual set-aside programs, and changing crop rotation patterns. However, the use of no-till and in some instances, double cropping (e.g., soybeans planted into grain stubble), has resulted in improved conditions for game bird broods and poults.
- Loss of cropland to long-term land retirement (CRP) that is not maintained in early-succession habitat, especially conversion to loblolly pine plantations, has dramatically reduced game bird habitat at the landscape level in several ecoregions. However, recent increases in the promotion and acceptance of Native Warm Season Grasses (NWSG) in some ecoregions and conversion of CRP fields from exotic grasses (old world bluestems, weeping lovegrass, Bermuda grass) to NWSG may be improving the quantity and quality of habitat for some game birds.

- Consolidation of cropland by species, farmland leasing, social stigma against brushy field borders, excessive maintenance mowing, and double cropping have lowered habitat quality and quantity for game birds.

## **Southern Pine Forests**

### **Ecology and Status**

Unfortunately, due to a variety of factors, most southern pine forests are only marginally suitable for habitation by bobwhites and eastern wild turkey, or not suitable at all. Within pine plantations, high stocking rates, short rotations, lack of openings, lack of prescribed burning, and changes in pre-plant site preparation methods have all contributed to a degradation of habitat quality for bobwhites and eastern wild turkey. Many mixed pine-hardwood stands resulting from natural succession have matured, developed closed canopy overstories and hardwood midstories that have shaded out understory vegetation, and greatly reduced habitat quality for quail and other early successional wildlife species.

Over the last two decades, the conversion of croplands to pine plantations within landscapes already dominated by forest cover has taken place on a broad scale through federal government cost-share programs such as CRP and FIP. Biologists have noted that cropfields established in pine are characterized by low diversity of understory plants compared to traditional clearcut and naturally regenerated or planted sites. Bobwhites and other early successional habitat-dependent species simply cannot thrive in these areas.

## Pine Forest Management Types

The Society of American Foresters (SAF, 1980) recognizes 10 forest cover types within the southern yellow pines group, and five cover types within the oak-pine group. For the purposes of bobwhite and eastern wild turkey management, these can be combined into three basic categories: longleaf-slash, loblolly-shortleaf and oak-pine. Longleaf-slash pine comprises a majority of the trees in the overstory, and within its range, slash pine may grow in association. Both longleaf and slash may occur on a variety of sites from dry sandy ridges to poorly drained flatwoods. Common woody associates may include dogwood, southern red oak, blackjack oak, water oak, sweet gum, gallberry, saw palmetto and others, depending on geographic location and site characteristics. Ground cover composition is typically bluestems, panicums, wiregrass, smilax (greenbriar) and asters, as well as partridge pea and other legumes.

Historically, longleaf pine forests covered an estimated 92 million acres, stretching from southeast Virginia to east Texas. Today, less than 4 percent of the original longleaf acreage remains, and much less than that represents an intact, functioning longleaf ecosystem. Longleaf pine lends itself particularly well to management for bobwhite and eastern wild turkey, due to the tree's more compact growth habit and tolerance for prescribed burning as a management tool.

**Loblolly-Shortleaf:** This type is composed of either pure stands of loblolly pine, or mixtures with shortleaf and/or other species. Pure shortleaf stands are rare. Associates are many, with sweetgum being one of the more common. Others include hickories, white and southern red oaks, red

maple, water oaks and yellow poplar. Woody understory species include beauty berry, blackberry, yellow jasmine, sumac, grapes and Japanese honeysuckle. Throughout the range, herbaceous ground cover is usually sparse because of heavy shading. Pure plantations of loblolly are broadly distributed, especially on industrial paper company lands, and on other private holdings where croplands have been converted to pine. These habitats are quite difficult to manage for bobwhites and eastern wild turkey, if maximum fiber production is the primary land-use goal.

**Oak-Pine:** Subtypes are longleaf pine-scrub oak and loblolly pine-hardwood associations. The longleaf-scrub oak community tends to occur exclusively on droughty, infertile soils. The scrub oaks include turkey, blackjack, bluejack and sand post oaks with persimmons, sumacs and hawthorns sometimes present. Herbaceous ground cover is sparse but may include wiregrass, bluestems, milkpeas and panicums.

The loblolly pine-hardwood type is ubiquitous, occurring on a wide range of sites. Loblolly usually comprises 20 percent or more of the stocking. Typical associates range from sweet bays, swamp tupelos and magnolias on moister soils to various oaks and hickories on uplands. Understory species may include dogwood, gallberry, blueberry, honeysuckle and yellow jasmine. Herbaceous ground cover is usually sparse, and succession favors the hardwoods. The success of bobwhite and eastern wild turkey management within the oak-pine types is highly dependent on burning or mechanical disturbances, usually combined with selective removal of hardwoods. Oak-pine forests are usually viewed more as "deer and turkey woods" than bobwhite management opportunities.

### **Southern Pine Forests as Bobwhite and Eastern Wild Turkey Habitat**

Pine forests in the south historically provided moderate to excellent habitat for bobwhites and eastern wild turkey, both in the nesting season and as winter range. Low-intensity silvicultural practices, frequent “controlled” burning and widespread free-ranging of livestock ensured high understory plant diversity and a frequent disturbance regime. In the last 40 to 50 years, demand for wood fiber and higher profits have led to increasingly intensive forest management. Use of prescribed fire has greatly diminished, and livestock operations have been moved to improved pastures. Forests have become dense and are poor bobwhite and eastern wild turkey habitat.

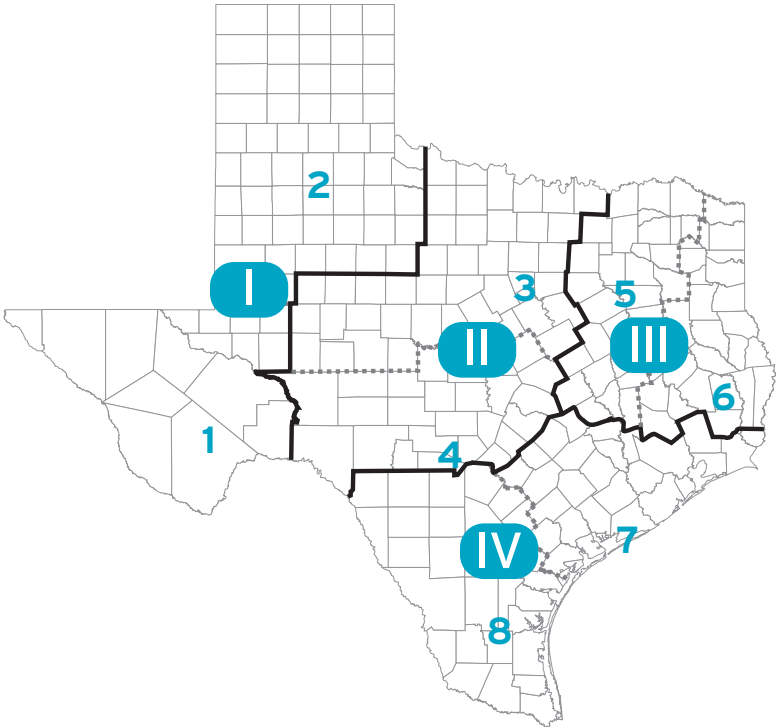
#### **Specific Problems**

- Although professional foresters have begun to prescribe lower density initial stocking rates for pine plantations, planting rates of 700-900 trees per acre are still common. This results in rapid canopy closure and very low to zero ground cover for bobwhites and eastern wild turkey. Even stands with stocking rates of 500 trees per acre rapidly close canopy.
- Conversion of croplands to pine plantations continues, especially in areas already dominated by forest cover.
- Many pine plantations are not thinned. Of the stands which are thinned, the frequency and intensity of thinning is insufficient to elicit a positive bobwhite and eastern wild turkey habitat response.

- Use of prescribed burning has greatly declined, primarily due to smoke-management liability issues.
- Most CRP pine stands can be improved for bobwhites, eastern wild turkey and other wildlife. The 50-point Environmental Benefits Index, established under the 1996 Farm Bill, requires 15 to 20 percent openings. Thinning and prescribed burning has the potential to greatly enhance this habitat type. However, these stands were exempted from the thinning requirement during the first three years of the CRP contract. At present, most of this acreage has not been thinned and burned at the intensity necessary for substantial improvement in habitat conditions.
- Pine rotations are becoming shorter due to rapid growth of improved seedlings, weed competition control and fertilization of established stands. These intensively managed, short rotation stands rarely reach sufficient age to have an open canopy and do not produce bobwhite and eastern wild turkey habitat.
- Pre-plant site preparation techniques have evolved away from mechanical means toward almost exclusive use of herbicides. Tank-mixes of various compounds effectively control most herbaceous and woody understory species until the pine seedlings dominate the site. Clearcuts that formerly could be relied on to produce bobwhites and eastern wild turkeys for five to seven years post-harvest, now produce no quail or eastern wild turkey at all.
- Raking pine straw and marketing it for mulch has become lucrative, resulting in pine stands with clean understories.

## Appendix B.

# TEXAS PARKS AND WILDLIFE DEPARTMENT WILDLIFE REGIONS AND DISTRICTS



### REGION I

**Regional Director:**

Ruben Cantu  
(325) 651-4748  
Fax: (325) 651-4752  
3407-B S. Chadbourne  
San Angelo, TX 76904

**District Leaders:**

- (1) Billy Tarrant  
(432) 837-2051  
Fax: (432) 837-5987  
109 S. Cockrell St.  
Alpine, TX 79830
- (2) Danny Swepston  
(806) 655-3782  
Fax: (806) 655-4045  
P.O. Box 659  
Canyon, TX 79015

### REGION II

**Regional Director:**

Clay Brewer  
(325) 641-9234  
Fax: (325) 641-1679  
301 Main St., Suite D  
Brownwood, TX 76801

**District Leaders:**

- (3) Kevin Mote  
(325) 643-5977  
Fax: (325) 643-6192  
301 Main St., Suite D  
Brownwood, TX 76801
- (4) Mike Krueger  
(830) 896-2500  
Fax: (830) 792-6167  
309 Sidney Baker South  
Kerrville, TX 78028

### REGION III

**Regional Director:**

Nathan Garner  
(903) 566-1626  
Fax: (903) 566-3273  
11942 F.M. 848  
Tyler, TX 75707

**District Leaders:**

- (5) David Sierra  
(903) 566-1626  
Fax: (903) 566-5538  
11942 F.M. 848  
Tyler, TX 75707
- (6) Gary Calkins  
(409) 384-6894  
Fax: (409) 384-7342  
1342 S. Wheeler  
Jasper, TX 75951

### REGION IV

**Regional Director:**

Len Polasek  
(361) 790-0306  
Fax: (361) 729-8940  
715 S. Hwy. 35  
Rockport, TX 78382

**District Leaders:**

- (7) David Forrester  
(979) 968-3501  
Fax: (979) 968-3086  
111 East Travis, Ste. 200  
La Grange, TX 78945
- (8) Joe Herrera  
(830) 569-8700  
Fax: (830) 569-6400  
1607 2nd St.  
Pleasanton, TX 78064

## Appendix C.

# CONTACT INFORMATION FOR GAME BIRD CONSERVATION PARTNERS

**Audubon Texas**

427 Sterzing, Suite 109  
Austin, TX 78704  
Phone: 512-236-9075  
Fax: 512-236-9077  
[www.tx.audubon.org](http://www.tx.audubon.org)

**Farm Bureau**

P.O. Box 2689  
Waco, TX 76702  
Phone: 254-751-2263  
Fax: 254-751-2671  
[www.txfb.org](http://www.txfb.org)

**Farm Service Agency**

P. O. Box 2900  
College Station, TX 77841  
Phone: 979-680-5150  
Fax: 979-680-5235  
[www.fsa.usda.gov/tx](http://www.fsa.usda.gov/tx)

**National Wild Turkey  
Federation**

Post Office Box 530  
Edgefield, SC 29824-0530  
Phone: 800-843-6983  
[www.nwtf.org](http://www.nwtf.org)

**Natural Resources  
Conservation Service**

101 South Main  
Temple, TX 76501  
Phone: 254-742-9800  
Fax: 254-742-9819  
[www.tx.nrcs.usda.gov](http://www.tx.nrcs.usda.gov)

**The Nature Conservancy**

P. O. Box 1440  
San Antonio, TX 78295-1440  
Phone: 210-224-8774  
Fax: 210-228-9805  
[www.nature.org/texas](http://www.nature.org/texas)

**North American Grouse  
Partnership**

P.O. Box 408  
Williamsport, MD 21795  
Phone: 301-223-1533  
[www.grousepartners.org](http://www.grousepartners.org)

**Pheasants Forever**

1783 Buerkle Circle  
St Paul, MN 55110  
Phone: 877-773-2070  
Fax: 651-773-5500  
[www.pheasantsforever.org](http://www.pheasantsforever.org)

**Playa Lakes Joint Venture**

103 East Simpson Street  
Lafayette, CO 80026  
Phone: 303-926-0777  
[www.pljv.org](http://www.pljv.org)

**Quail Unlimited**

P. O. Box 610  
Edgefield, SC 29824  
Phone: 803-637-5731  
Fax: 803-637-0037  
[www.qu.org](http://www.qu.org)

**Quail Forever**

1783 Buerkle Circle  
St Paul, MN 55110  
Phone: 877-457-8245  
Fax: 651-209-4988  
[www.quailforever.org](http://www.quailforever.org)

**Texas Agrilife  
Extension Service**

312 Nagle Hall, TAMUS 2258  
College Station, TX 77843-2258  
Phone: 979-845-7473  
Fax: 979-845-7103  
[http://wfscnet.tamu.edu/  
extension/index.htm](http://wfscnet.tamu.edu/extension/index.htm)

**Texas Mining and  
Reclamation Association**

100 Congress Ave, Suite 1100  
Austin, TX 78701  
Phone: 512-236-2325  
Fax: 512-236-2002  
[www.tmra.com](http://www.tmra.com)

**Texas Wildlife Association**

2800 NE Loop 410, Suite 105  
San Antonio, TX 78218  
Phone: 210-826-2904  
Fax: 210-826-4933  
[www.texas-wildlife.org](http://www.texas-wildlife.org)

**Wildlife Habitat Federation**

3285 FM 947  
Cut Spring, TX 78933  
Phone: 979-732-8362  
Fax: 979-738-8498  
[www.whf-texas.org](http://www.whf-texas.org)

## Appendix D.

# BOOKS AND OTHER SOURCES OF INFORMATION ABOUT GAME BIRDS AND GAME BIRD MANAGEMENT

Allen, D. L. (editor). 1956. Pheasants in North America. Stackpole books, Harrisburg, Pennsylvania, USA.

Archer, S. 1994. Woody plant encroachment into southwestern grasslands and savannas: rates, patterns and proximate causes. Pp. 13-68 in: Vavra, M., Laycock, W. A. and Pieper, R. D., editors. Ecological implications of livestock herbivory in the west. Society for Range Management, Denver, CO.

Baxter, W. L., and C. W. Wolfe. 1973. Life history and ecology of the ring-necked pheasant in Nebraska. Nebraska Game and Parks Commission. Technical Publication 58.

Brennan, L. A. 1999. Northern bobwhite (*Colinus virginianus*). In Birds of North America, No. 397 (A. Poole and F. Gill, editors). Birds of North America, Inc., Philadelphia, Pennsylvania, USA.

Brennan, L. A. (editor). 2007. Texas Quails: Ecology and Management. Texas A&M University Press, College Station, Texas, USA.

Brown, D. E., J. C. Hagelin, M. Taylor, and J. Galloway. 1998. Gambel's quail (*Callipepla gambelii*). In Birds of North America, No. 321 (A. Poole and F. Gill, editors). Birds of North America, Inc., Philadelphia, Pennsylvania, USA.

Cantu, R. et al. 2006. Scaled Quail Management in Texas. Texas Parks and Wildlife Department, Austin, Texas, USA.

Cearly, K. A. (editor). Preserving Texas' Quail Heritage into the 21st Century. Proceedings at a Symposium. Texas Cooperative Extension, Department of Wildlife and Fisheries, Texas A&M University System.

Crawford, J. A., and E. G. Bolen. 1976. Effects of land use on lesser prairie chickens in Texas. *Journal of Wildlife Management* 40:96-104.

Dickson, J. G. (editor). 1992. The wild turkey: biology and management. Stackpole books, Harrisburg, Pennsylvania, USA.

Eaton, S. W. 1992. Wild turkey (*Meleagris gallopavo*). In Birds of North America, No. 22 (A. Poole and F. Gill, editors). Birds of North America, Inc., Philadelphia, Pennsylvania, USA.

- Farris, A. L., E. D. Klonglan, and R. C. Nomsen. 1977. The ring-necked pheasants in Iowa. Iowa Conservation Commission, Des Moines, Iowa, USA.
- Frost, C. C. 1998. Presettlement fire frequency regimes of the United States: a first approximation. Tall Timbers Fire Ecology Conference Proceedings 20:70-81.
- Giesen, K. M. 1998. Lesser prairie-chicken (*Tympanuchus pallidicinctus*). In Birds of North America, No. 364 (A. Poole and F. Gill, editors). Birds of North America, Inc., Philadelphia, Pennsylvania, USA.
- Giudice, J. H., and J. T. Ratti. 2001. Ring-necked pheasant (*Phasianus colchicus*). In Birds of North America, No. 572 (A. Poole and F. Gill, editors). Birds of North America, Inc., Philadelphia, Pennsylvania, USA.
- Guthery, F. S. 2000. On Bobwhites. Texas A&M University Press, College Station, Texas, USA.
- Hallet, D. L., W. R. Edwards, and G. V. Burger. (editors). 1988. Pheasants: symptoms of problems on agricultural lands. North-central section of the Wildlife Society, Blomington, Indiana, USA.
- Hagen, C. A., B. E. Jamison, K. M. Giesen, and T. Z. Riley. 2004. Guidelines for managing Lesser Prairie-Chicken populations and their habitats. Wildlife Society Bulletin 32:69-82.
- Hays, K. B., M. Wagner, F. Smeins, and R. N. Wilkins. 2004. Restoring Native Grasslands. Texas Cooperative Extension. L-5456.
- Hellickson, M., and A. Radomski. 1999. Bobwhites of the Wild Horse Desert: Status of our Knowledge. Caesar Kleberg Wildlife Research Institute Wildlife Management Bulletin 4, Kingsville, Texas, USA.
- Hewitt, O. H. 1967. The wild turkey and its management. The Wildlife Society, Washington, D. C., USA.
- Hill, D. A., and P. Robertson. 1988. The pheasant: ecology, management, and conservation. BSP Professional Books, Oxford, United Kingdom.
- Jackson, A. S., and R. DeArment. 1963. The lesser prairie chicken in the Texas panhandle. Journal of Wildlife Management 27:733-737.
- Johnsgard, P. A. 2002. Grassland grouse and their conservation. Smithsonian Institution Press, Washington, D. C. (157pp.)
- Jones, R. E. 1963. Identification and analysis of lesser and greater prairie chicken habitat. Journal of Wildlife Management 27:757-778.



- Masters, R. E., K. Robertson, C. Ambrose, J. Cox, L. Green, K. McGorty and B. Palmer. 2003. Red Hills Forestry Stewardship Guide. Tall Timbers Research Station, Tallahassee, Florida. (78pp.)
- McAtee, W. L. (editor). 1945. The ring-necked pheasant and its management in North America. American Wildlife Institute, Washington, D. C.
- McPeherson, G. R. 1997. Ecology and management of North American savannas. The University of Arizona Press, Tucson, USA.
- Oklahoma Cooperative Extension Service and Oklahoma State University. 2001. Ecology and management of the lesser prairie-chicken. Oklahoma Cooperative Extension Service Publication No. E-970, Stillwater Oklahoma, USA.
- Peterson, M. J. 2000. Plain chachalaca (*Ortalis vetula*). In Birds of North America, No. 550 (A. Poole and F. Gill, editors). Birds of North America, Inc., Philadelphia, Pennsylvania, USA.
- Rollins, D., D.N. Ueckert, C. G. Brown. 1997. Brush Sculptors. Texas Agricultural Extension Service, College Station, Texas.
- Sauer, J. R., J. E. Hines, I. Thomas, J. Fallon and G. Gough. 1999. The North American Breeding Bird Survey, Results and Analysis, 1966-1998. United States Geological Service Patuxent Wildlife Research Center, Laurel, Maryland, USA.
- Schemnitz, S. D. 1994. Scaled quail (*Callipepla squamata*). In Birds of North America, No. 106, (A. Poole and F. Gill, editors). Birds of North America, Inc., Philadelphia, Pennsylvania, USA.
- Schmidly, D. J. 2002. Texas natural history: a century of change. Texas Tech University Press, Lubbock, Texas.
- Schorger, A. W. 1966. The wild turkey its history and domestication. University of Oklahoma Press, Norman, Oklahoma, USA.
- Stromberg, M. R. 2000. Montezuma quail (*Cyrtonyx montezumae*). In Birds of North America, No. 524, (A. Poole and F. Gill, editors). Birds of North America, Inc., Philadelphia, Pennsylvania, USA.
- Taylor, M. A., and F. S. Guthery. 1980. Status, ecology, and management of the lesser prairie chicken. U. S. Department of Agriculture, Forest Service, General Technical Report RM-77, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.
- Trautman, C. G. 1982. History, ecology, and management of the ring-necked pheasant in South Dakota. South Dakota Department of Game, Fish, and Parks. Pierre, South Dakota, USA. Bulletin No. 7.



Whiteside, R. W., and F. S. Guthery. 1983. Ring-necked pheasant movements, home ranges, and habitat use in west Texas. *Journal of Wildlife Management* 47:1097-1104.

Wilkins, N, A. Hays, D. Kubenka, D. Steinbach, W. Grant, E. Gonzalez, M. Kjelland, and J. Shackelford. 2003. *Texas Rural Lands: Trends and Conservation Implications for the 21st Century*. Publication number B-6134. Texas Cooperative Extension. Texas A&M University System. College Station, Texas. (26pp.)

Wright, H. A. and A. W. Bailey. 1982. *Fire ecology, United States and southern Canada*. John Wiley and Sons, New York, USA.

\*National Quail Symposium proceedings I through V are available from Tall Timbers Research Station: <http://www.talltimbers.org/info/pubcategories.html>

\*\*National Wild Turkey Symposium proceedings I through IX are available from the National Wild Turkey Federation, Post Office Box 530, Edgefield, SC 29824-0530  
Phone: 800-843-6983.

## Appendix E.

# WEB SITES WITH GAME BIRD INFORMATION

### **Team Quail**

<http://teamquail.tamu.edu>

### **Texas Parks & Wildlife Department**

<http://www.tpwd.state.tx.us>

### **Caesar Kleberg Wildlife Research Institute**

<http://www.ckwri.tamuk.edu>

### **Texas Brigades Youth Wildlife Leadership Program**

<http://www.texasbrigades.org>

### **Southeast Quail Study Group**

<http://seqsg.qu.org/seqsg>

### **Land Fragmentation and Changing Land Use**

<http://landinfo.tamu.edu>

### **Bollenbach Chair in Wildlife Ecology**

<http://bollenbachchair.okstate.edu>

### **Forming Wildlife Cooperatives**

[http://www.tpwd.state.tx.us/conserve/pdf/72wildlife\\_co-op.pdf](http://www.tpwd.state.tx.us/conserve/pdf/72wildlife_co-op.pdf)

### **Private Lands Enhancement**

[http://www.tpwd.state.tx.us/conserve/private\\_lands](http://www.tpwd.state.tx.us/conserve/private_lands)

### **Nature Tourism**

<http://www.tpwd.state.tx.us/landwater/land/programs/tourism/>

### **Texas Natural Resource Server**

<http://texnat.tamu.edu>

### **Texas Forest Service**

<http://txforestservice.tamu.edu>

### **Texas Master Naturalist Program**

<http://masternaturalist.tamu.edu>

### **North American Bird Conservation Initiative**

<http://www.nabci-us.org>

### **Playa Lakes Joint Venture**

<http://www.pljv.org>

### **Gulf Coast Joint Venture**

<http://www.gcjv.org>

### **Lower Mississippi Valley Joint Venture**

<http://www.lmvjv.org>

### **Central Texas Joint Venture and Rio Grande Joint Venture**

Watch Texas Parks and Wildlife's Web site for more information.

<http://www.tpwd.state.tx.us>

### **Pastures for Upland Birds Program**

[http://www.tpwd.state.tx.us/landwater/land/habitats/post\\_oak/upland\\_game/pub/](http://www.tpwd.state.tx.us/landwater/land/habitats/post_oak/upland_game/pub/)

### **South Texas Natives**

<http://www.southtexasnatives.org/>

### **North Texas Ecotype Project**

<http://www.tarleton.edu/~ntep>  
<http://stephenville.tamu.edu/~jmuir/ecoproj>

### **Wildlife Habitat Federation**

<http://www.whf-texas.org>

## Appendix F.

# BACKGROUND INFORMATION FOR HABITAT EVALUATION

Note to habitat evaluator: A management prescription for habitat improvement should be developed only after careful on-the-ground examination of all required components for a particular species (based on its life history) in order to determine what factor(s) may be limiting or absent. When formulating recommendations to correct habitat deficiencies, particular importance should be given to (1) what factor is most limiting, and (2) interspersion of all required habitat components on the scale that is being considered for management (i.e., pasture, section, property or properties, watershed). In many instances, a manager may wish to consider the needs of multiple species when formulating comprehensive land management treatments. As such, habitat evaluation for a particular species may be conducted in the context of “planned compromise” for an array of wildlife in which optimum suitability for no single

species is achieved; rather, improvement in overall habitat quality (land health) for a suite of wildlife occurs. Therefore, basic knowledge of life history and ecology of individual/multiple species is essential not only for development of a habitat (land) prescription that is ecologically sound and economically feasible, but also so that reasonable expectations for increase in wildlife numbers due (in part) to implementation of land improvements designed to address the needs of multiple species can be met.

Currently, the appendices of this handbook only include a habitat evaluation guide for eastern wild turkey. Habitat evaluation guides are under construction for Rio Grande turkey and bobwhite quail in Texas. The Oklahoma state wildlife agency has a bobwhite guide which is applicable for portions of the Rolling Plains of Texas.



**H. Timber Harvest (Uneven-aged and even-aged stand management are both viable turkey management strategies. Please select and score the category that best describes your property.)**

**a. Uneven-aged (stand entry):**

None	15+ year	10-15 year	5-10 year						
1	5	8	10	x	6	=	<u>n/a</u>		
		OR							

**b. Even-aged**

**I. Stand size (acres)**

>320	201-320	101-200	51-100	<51					
1	3	5	8	10	x	2	=	<u>16</u>	

**II. Riparian zones (% of area)**

<1%	1-4%	5-9%	10-20%	>20%					
1	3	5	8	10	x	2	=	<u>20</u>	

**III. Cutting interval between stands (years)**

<3	3-10	>10							
1	5	10	x	2	=	<u>20</u>			

**I. Proportion of forest in mature, favored upland hardwood species**

<10%	10-30%	31-50%	>50%						
1	3	7	10	x	6	=	<u>18</u>		

**J. Proportion of forest in mature, favored bottomland hardwood species**

<10%	10-30%	31-50%	>50%						
1	3	7	10	x	10	=	<u>100</u>		

**K. Hardwood species diversity (bottomland and upland) (no. of species)**

Zero species									10+ species
0	1	2	3	4	5	6	7	8	9
					6				10
						x	6	=	<u>36</u>

**L. Understory woody plant density (feet of horizontal visibility)**

<50	>100	50-75	76-100						
2	4	6	10	x	6	=	<u>36</u>		

**M. Understory woody plant diversity (no. of species)**

1	2-3	4-6	7-10	10-15	15+				
1	3	5	7	9	10	x	6	=	<u>42</u>

Total Score = 773  
 ÷ 918\*  
 = 84%

\*Out of a possible 918 points

## Appendix H.

# QUAIL MANAGEMENT AND SURVEY INSTRUCTIONS

## EXAMPLE QUAIL MANAGEMENT PLAN

### **Sample quail management section (6b) from a wildlife management plan:**

See the full TPWD wildlife management plan template (WMP) at

<http://www.tpwd.state.tx.us/landwater/land/private/pubsforms>

web link »

Biologists of the Texas Parks and Wildlife Department provide guidance and recommendations to landowners and managers who want to include wildlife management considerations in present or future land use decisions. This service is provided without charge through the private lands program. Department biologists work with

landowners to develop and then meet the wildlife management goals and objectives for all species of landowner interest on a given property. The following hypothetical scenario is general representation of quail management techniques and rules of thumb. If you have an interest in developing a WMP for your property, please contact your local biologist to arrange a site visit.

### **The contact information for biologists by county can be found on our Web site at:**

[http://www.tpwd.state.tx.us/landwater/land/technical\\_guidance/biologists/](http://www.tpwd.state.tx.us/landwater/land/technical_guidance/biologists/)

« web link



# SECTION 6B UPLAND GAME BIRD MANAGEMENT

Quail/pheasant/prairie chicken (specify):

Bobwhite quail

## 1. Bird Population Management Goals:

### a. Population Management Goals:

Desired Density Goal For Bobwhite Population (Acres/Bird):  
Fall OR Spring

2/1

Desired Production by Nov. 1st (Juvenile/Adult):  
(Juvenile-to-adult ratio in the fall population)

3/1

### b. Methods used to determine population density and date to submit data:

#### Survey Techniques

<p><b>Call Counts (specify count type):</b> Fall morning covey call Spring breeding male point counts</p>	<p><b>Complete during:</b> October 1st - November 15th May 1st - June 7th</p>
<p><b>Incidentals (comments):</b> Collect incidental observations while on the property during summer (date, broods observed, size of chicks).</p>	<p><b>Submit by date:</b> September 15th</p>
<p><b>Other (comments):</b> Collect number of coveys observed while completing the fall helicopter deer census.</p>	<p><b>Submit by date:</b> Upon completion</p>

(See Appendices J and K for instructions and forms for the call count surveys.)

## 2. Specific Habitat Management Goals and Recommendations:

Practices listed below can be used to increase the amount of space that is usable by quail, by evenly distributing (interspersing) the cover types (nesting, brooding, escape, screening and loafing) needed for survival.

### a. Nesting/screening cover management:

**Prescribed burning:** This practice is highly compatible with bobwhite quail management and is essential to maintaining grassland and grassland savannah plant communities. It invigorates desired grasses (nesting cover), removes ground litter, and inhibits brush encroachment. Burns that leave behind a mosaic of burned and unburned areas are most desirable.

Prescribed burning can be used to maintain natural openings, shift woodlands/brush toward relatively open savannah, and create better nesting habitat for quail and turkey. Develop burn plans for pastures with the assistance of qualified resource professionals, and see the following publication for more information on how to safely conduct burns: [http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd\\_bk\\_w7000\\_0196.pdf](http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_bk_w7000_0196.pdf) When putting in fire lanes, target the times outlined in Section B, “brood cover management,” to complete both goals at the same time.

**Prescribed grazing:** Used to increase and maintain native bunch grass health, vigor and dominance on the landscape in order to provide suitable nesting, roosting, brooding and screening cover for bobwhite quail. It is crucial that livestock be moved out of any given pasture before the native grass stand density falls below a level at which it cannot recover, and more importantly, below a level at which it becomes unusable by quail. About 6 to 8 inches average stubble height is considered the lowest height to provide just enough screening cover for a quail to move across the pasture unnoticed.

A key consideration to remember is that over time, most continuous grazing systems become dominated by cool-season annual and other “increasers,” and the preferred nesting cover for bobwhites—native warm-season grasses—decreases. **Lack of suitable nesting cover is the weak link or limiting factor over much of the bobwhite's range in Texas.** If livestock are deferred for at least two full growing seasons (ideally removed in early March and not returned until after the second summer), native warm-season grasses can begin to recover. Prescribed fire can be used to increase the vigor and density of native bunch grasses. Late winter/early spring burns (February - March) favor the grass component more than forbs. The goal is to have an even interspersing of native bunch grasses (about 12 inches in diameter and at least 8 inches tall) at a density of 200 to 400 clumps per acre depending on location in Texas.

Heavy spot grazing around salt blocks and feed areas that are moved around pastures will enhance brooding cover. Cattle should be excluded from sensitive sites such as wooded, riparian and bottomland areas, which can be accomplished with cross fencing, which benefits a number of wildlife species. Sensitive sites can be maintained with flash grazing and winter prescribed burns.

**Native grass restoration:** Bobwhite quail are grassland birds that prefer to use two- to three-year-old clumps of native warm-season bunch grass for nest sites. These clumps are about 12 inches in diameter and 2 to 3 feet high. Nest sites are often associated with some form of low, woody cover. Ideal bunch grass density lies somewhere between 250 to 400 clumps per acre. This translates to a clump about every 6 to 12 steps and allows for ease of movement by adults and chicks.

Although native grass seed persists in the soil bank, it may take several years of rest from grazing for bunch grass recovery. The cultivation of native grasses may be a more timely way to boost grasslands. Species such as switchgrass, little bluestem and plains bristle grass are some of the native species that are available from native seed companies. It is important to use seed that is cultivated as close as possible (within about 200 miles) to ensure that it will be locally adapted and increase the chance of success. Choose a small area (smaller than 5 acres) with a good soil layer and experiment with some native grass plantings. Contact your local NCRS, Texas Agrilife Extension Service, or TPWD biologist for suggestions of what native species might work in your county.

Native grass restoration sites should be chosen based on soil type, topography, and ability to exclude cattle. Preparation of the seedbed begins with a deep disking (16 to 20 inches) just before the fall rains to allow for moisture penetration. The following spring the area can be lightly disked (2 to 4 inches) or shredded to remove weeds. Next, native seed can be broadcast and packed or drilled (depending on seed type) 1/2 inch below the surface.

**b. Brood cover management:**

**Fallow field disking for quail and other wildlife:** Promotes seed-producing plants (forbs), creates ideal brood cover (bugging areas for quail chicks), and is more cost-effective than food plots.

If sufficient brood cover is a limiting factor, a four-year rotation of fallow disking can be incorporated into your wildlife management plan: Disk one-quarter of designated roadside/highline strips each year (each strip re-disked no sooner than every fourth year). Try to evenly distribute strips across the ranch so that one-, two-, three- and four-year-old strips are in close proximity. Width of roadside strips should be the width of your disk and 2 to 4 inches deep, just deep enough to break up the sod (deeper in heavier soils). Avoid the shallow soils (gravel areas) and areas with a >10 degree slope to prevent erosion problems. Time of year should be October to February with the ideal months being October, and December through January. Burn Unit boundaries should be disked the same year that they are scheduled to be burned so that they may serve as fire lanes. See the following publication for more information on fallow disking for wildlife:

[http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd\\_rp\\_w7000\\_1128.pdf](http://www.tpwd.state.tx.us/publications/pwdpubs/media/pwd_rp_w7000_1128.pdf)

**c. Escape and loafing cover management:**

**Brush management/manipulation:** In order to increase usable space for quail, mature brush/woodlands should be reduced to 30 to 40 percent of the total acreage. These percentages leave enough cover for larger species like turkey and deer. Intact areas include a buffer around existing bottomlands and drainages to preserve turkey roost sites, travel corridors and thermal cover for deer/turkey. Riparian corridors are sensitive areas that offer unique wildlife habitat and should be conserved.

Given today's technology, it is easy to develop a GIS-based map of the property which integrates topography and soils and then determine the best locations and orientation of future strips. Target brush reduction to 30 percent of the total area. Sculpt areas, leaving behind mottes or strips of brush. Mottes should be at least 15 feet in diameter, and strips should be 30 to 80 yards cleared followed by 30 to 50 yards intact. Consult with your local biologist to develop the best strategy for your property.

### 3. Wildlife Harvest and Record-Keeping Recommendations

**a. Recommended record-keeping (harvest log, survey sheets, etc., can be included):**

Harvest logs should be kept for each hunt which include the date, age (juvenile or adult), sex, and approximate location of harvest (pasture) for each bird taken. Crippled birds not recovered should be included in the total harvest. The total time in the field for each hunt and number of hunters in the party should also be recorded.

**Sample Harvest Log Sheet:**

Date:	Time in:	Time out:	# of hunters:
AGE (juv/adult/cripple)	SEX	PASTURE	COMMENTS

# FALL MORNING COVEY COUNTS (BOBWHITE QUAIL)

## **Background:**

Although there are numerous methods used to estimate quail populations, the fall morning covey counts can be easily conducted and require minimal time and energy. These counts represent a proportion of all the coveys within the listening radius of the observer (about 500 yards). Using a calling rate of 0.78 and average covey size, the density of quail within the listening radius can be estimated. However, the covey calling rate was developed by the Tall Timbers Research Station in Florida and needs evaluation in Texas. Each point should be conducted at least three times. Multiple observers can be used on the same morning to ensure each point is counted under the same conditions. Points should be located at least 3/4 mile apart and located away from highways or other noisy areas. Counts should not be conducted in rainfall, high winds (>10mph), or if there is a substantial change in the barometric pressure.

**For more information on quail survey techniques, see the Texas Agrilife Extension publication *Counting Quail* at: <http://agrilifebookstore.org>**

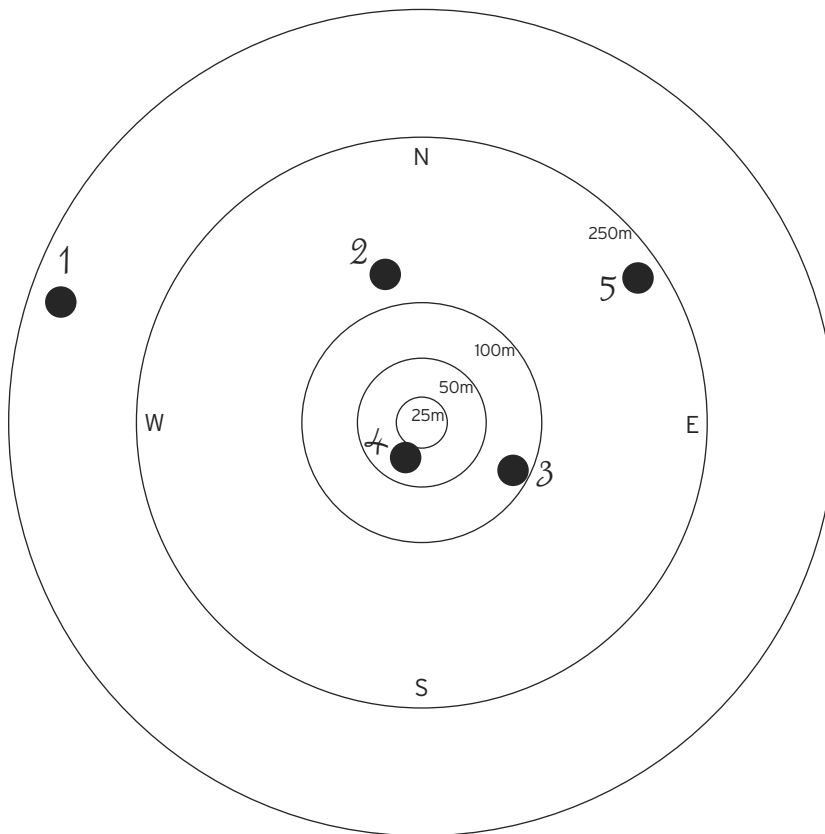
- Prior to conducting covey call counts, observers should receive training that consists of testing the accuracy of estimation of calling distance, and a minimum of three mornings of field monitoring of wild covey calling. Distance testing may be accomplished using electronic callers or pen-reared birds.
- Consistency among years in observers is critical for accurate evaluation and can be maximized by thorough training and/or having the same observers at the same points year after year.
- Surveys can be conducted between the last week of September and the second week of November with the optimal time usually being the last two weeks of October, and the latest measurement occurring before hunting (usually firearms season) commences on sample fields.
- The effective listening radius under most conditions will be out to 500 yards from the survey point, which gives an inference area of 194 acres. This may be increased in open, flat landscapes. Adjacent survey points should be spaced at least 1,000 yards apart to ensure independence.
- In heterogeneous landscapes it is necessary to locate points to incorporate representative portions of each landscape feature that are considered potentially usable by coveys.

## **Survey Instructions:**

**Directions:** Arrive at the point 45 minutes before sunrise and begin listening for calling coveys in all directions. Orient yourself to your surroundings on a prior date during daylight hours. Mark covey locations on the diagram below using a small dot and the number (1, 2, 3, etc.) of the covey heard. In the spaces provided, write the TIME that the corresponding covey began calling. Continue listening for calling coveys until all covey calling has ceased (approximately five minutes before sunrise). After the count, write the total number of coveys heard in the appropriate space.

**Example date sheet:**

Date: 10/25/07	PointID: South pasture							
Observer: John	Cloud (%): 10%							
Total # of Coveys Heard: 5								
Covey #:	1	2	3	4	5	6	7	8
Time:	6:25	6:36	6:38	6:38	6:39			



**Figure 1**  
Distance Reference Map

**Figure 2 Example Data Summary Sheet:**

Pasture	Date	Cloud Cover	Wind Spd	Temp	No. Coveys	Calling Rate	Corrected Coveys	Covey Size	Total Bobs	Area (acres)	Bobs/acre
Pasture A	10/25/07	10%	5.0	65	8	0.78	10.3	11.5	117.9	125.0	0.9
Pasture A	10/30/07	20%	2.0	70	3	0.78	3.8	11.5	44.2	125.0	0.4
Pasture A	11/05/07	40%	8.0	50	8	0.78	10.3	11.5	117.9	125.0	0.9
Pasture B	10/25/07	10%	5.0	65	4	0.78	5.1	11.5	59.0	125.0	0.5
Pasture B	10/26/02	20%	2.0	70	2	0.78	2.6	11.5	29.5	125.0	0.2
Pasture B	11/05/07	40%	8.0	50	6	0.78	7.7	11.5	88.5	125.0	0.7

Average quail per acre = 0.6



# PROCEDURE FOR BREEDING SEASON CALLING MALE BOBWHITE COUNTS

## Survey Instructions:

1. Make sure all points have been clearly marked prior to the survey (flagging, pole, location coordinates) and observers understand directions to the point.
2. Have a data recording sheet ready for observers. A range finder can help in gauging distances to reference points.
3. Do not conduct the survey if there are high winds (> 6.5 mph or sustained 4 or greater on Beaufort Scale), cloud cover (>75% cloud cover), rain, or a dramatic drop in barometric pressure (> 0.05 in/Hg.). If these conditions are encountered, cancel the sampling for the day and reschedule.
4. Multiple points/per morning can be surveyed by a single observer as long as observers complete counts within two hours after sunrise.
5. All observers should arrive at the first point of the morning approximately 15 minutes before sunrise. Disturbance should be kept to a minimum while at the point.
6. Before calling begins orient the distance reference map in the appropriate direction (facing north) and be prepared to record data.
7. Call counts will consist of a 10-minute observation period in which the number of uniquely identifiable calling male bobwhites detected will be recorded within each of six distance bands (0-25, 25-50, 50-100, 100-250, 250-500, > 500 yards). Use a watch to keep track of time.
8. Record each uniquely identifiable calling male first by placing a unique sequential number on the distance reference map (Figure 1) and, secondly, indicating in the appropriate line on the data recording sheet whether the bird was heard or seen (Figure 2). Additionally, it is advisable to keep the distance reference map (Figure 1) readily available to help judge distances to objects.
9. The recorded distance band should be based on the estimated distance between the sampling point and the location at which the bird was first detected.



## Appendix I.

# RIO GRANDE WILD TURKEY MANAGEMENT AND SURVEY INFORMATION

## EXAMPLE RIO GRANDE WILD TURKEY MANAGEMENT PLAN

### **Sample turkey management section (6b) from a wildlife management plan:**

See the full TPWD wildlife management plan template (WMP) at

<http://www.tpwd.state.tx.us/landwater/land/private/pubsforms>

web link >>

Biologists of the Texas Parks and Wildlife Department provide guidance and recommendations to landowners and managers who want to include wildlife management considerations in present or future land use decisions. This service is provided without charge through the private lands program. Department biologists work with

landowners to develop and then meet the wildlife management goals and objectives for all species of landowner interest on a given property. The following hypothetical scenario is general representation of quail management techniques and rules of thumb. If you have an interest in developing a WMP for your property please contact your local biologist to arrange a site visit.

### **The contact information for biologists by county can be found on our website at:**

[http://www.tpwd.state.tx.us/landwater/land/technical\\_guidance/biologists/](http://www.tpwd.state.tx.us/landwater/land/technical_guidance/biologists/)

<< web link

# SECTION 6B

## UPLAND GAME BIRD MANAGEMENT

### RIO GRANDE WILD TURKEY

#### **1. Wild Turkey Population Management Goals:**

To maintain a population density of approximately one bird per 20 acres across 10,000 acres of contiguous suitable habitat.

#### **2. Specific Habitat Management Goals and Recommendations:**

##### **a. Roost site management:**

Maintain existing roost sites while encouraging stand regeneration to ensure long-term persistence of roosting habitat and loafing cover by conducting selective removal of invasive woody plants such as Ashe juniper, redberry juniper, eastern red cedar, salt cedar (tamarisk), honey mesquite (dense thickets), and Russian olive. To ensure long-term roost site quality, consider fencing of known roosts with large buffer zones as their own pastures/paddocks (especially riparian areas) to enable special grazing management (establish control over season of use and length of grazing period). The desired effect is to promote the growth of valuable food and cover plants for wild turkeys and associated species (mature forms of oaks, pecans, elms, honey mesquite, walnuts, sycamore, willow, cottonwood, chittamwood, hackberry, soapberry, sumacs, grapes and plums). In many areas of the state, this can be safely accomplished without harm to vegetation in sensitive low-lying areas, wetlands, and water quality by the careful use of short-duration grazing with moderate stocking rates conducted during winter months (contact your local TPWD wildlife biologist or NRCS range management specialist). Grazing during the dormant season can (1) remove rank herbaceous growth (cured grass and weeds) in the understory while (2) not harming young saplings that are naturally regenerating due to protection afforded during the growing season. The amount of horizontal visibility for turkeys as determined by vegetative composition around and underneath roosts is very important as they approach and leave these sites due to their keen sense of sight and hearing (natural defense mechanisms). The ability to see well is especially critical to their physical safety and comfort level in using particular roosts, as is their ability to see vertically when on the roost. So, vegetation management is especially important to ensure that visibility is good. Generally stated, as vegetative composition gets thicker (denser) and visibility decreases, roost site quality decreases. Therefore, in some cases, careful mechanical removal of certain invasive woody species may be recommended to enhance/perpetuate roost site integrity. Young, low-growing forms of desirable food/roost trees with smooth, horizontal limbs are particularly important to hens with young poults from the time they can fly (~3 weeks of age) in late spring until the end of summer because of the highly protective brooding behavior of hens. Picture, if you will, a hen turkey with legs locked firmly in place on a low, smooth limb no more than 15 to 20 feet off the ground with outstretched wings

held over young, gangly poults on either side of her; and, perhaps one perched on her back. As summer and fall progresses, 3/4-sized young turkeys that have not succumbed to weather or predation (including from owls while on the roost at night) spread out throughout the roost timber and are more loosely associated with hens while still in close proximity. In some areas of extremely high deer densities, another benefit of aggressive population management may be prevention of over-browsing on desirable native woody plants in these key areas.

**b. Water management:**

Ensure reliable natural or artificial water sources (at least one per square mile). Water sources should be at ground level to facilitate use by poults. Fence off portions of stock pond perimeters to prevent trampling and grazing of surrounding vegetative cover that gives hens and poults safe pathways to water. Do not use net fencing.

**c. Nesting and brood-rearing cover management:**

Because of their large size, wild turkeys utilize taller herbaceous vegetation and shrubby vegetation for cover more than any other upland game birds do. Nesting cover should be mainly grasses with intermittent woody cover, at the rate of shrubs or trees every 50 to 100 feet. Hens prefer nest sites that provide both ground-level horizontal cover and overhead cover, which are nest site selection considerations. Rio Grande wild turkeys often prefer nesting beneath shrubs or adjacent to a "guard object," such as a log, tree or fence post. Brood-rearing cover should be predominately grasses and forbs, with about 50 percent bare ground. Vegetation height is critical, especially for brood-rearing. Grass height should be sufficient to hide poults, but short enough to allow hens to see predators. Wildlife researchers have found that a vertical structure of ~18-24 inches (patchy weeds and grass with spots of bare ground) is ideal for use by hens with young poults.

An integrated program of planned livestock grazing (with rest periods and rotation), brush management, and prescribed burning will generally facilitate high-quality habitat for Rio Grande wild turkeys throughout their range in Texas. As it turns out, these management treatments often enhance conditions for grassland birds (including bobwhite quail, scaled quail, lesser prairie chickens, Cassin's sparrow, lark bunting, scissor-tailed flycatcher), reptilian species (Texas horned lizard, a state-listed threatened species; box turtles), and big game species (white-tailed deer, desert mule deer), not to mention improvement of native forage quality for livestock. The key is to think of all three elements as a system with interlocking parts. Integration of all three land treatments as appropriate for a particular tract of land starts with comprehensive planning available from professionals (previously mentioned). Consider that this year's deferred pasture (fuel load) is next year's prescribed burn unit. If large pastures are burned to work well within a rotational livestock grazing system (and custom-designed systems are myriad), there will no doubt be areas than burn "hotter" and "cooler" to yield a natural mosaic that attract wild turkeys and other native species. The current year's cool-season burn will be highly palatable as livestock forage, and thus will require careful management (including deliberate protection from grazing for a period of time). The burned area is also this year's preferred brood-rearing (feeding and bugging area) for wild turkey poults and quail chicks, provided that clumps of overhead

protective cover such as plum thickets, hackberry, shin oak, and soapberry are located in close proximity. It is also a “salad patch” of native forbs and legumes for deer (weed and browse eaters). So, while one must “think like a turkey” when planning brush management, grazing, and burning treatments, he/she will undoubtedly benefit habitat for an array of hunted and non-hunted species. Planned use of all three techniques suggests the opportunity for cooperation among smaller ownerships in certain parts of the state where fragmentation of land ownership (and habitat) has occurred. For example, a group of adjoining landowners might consider “pooling” pastures into a series of grazing units to promote moderate grazing use and rest periods that are generally beneficial to deer, wild turkeys, and quail, and that are needed in order to develop fuel loads for employment of prescribed fire. And, it turns out that areas of residual cover that are heavy enough (~2,500-3,000 pounds per acre of dry fine fuel) to carry fire, but that are not burned in a particular year, provide adequate amounts of nesting cover for wild turkeys and quail; in addition, they serve as fawning cover for deer, not to mention improved hydrologic conditions (increased water infiltration) and aesthetic benefits that occur on the land. So, land management for Rio Grande wild turkeys can easily be considered part of a system that relies to a great extent on artificial replication of natural processes that occurred through the range of this native upland bird in Texas, and as part of a system that can flourish with cooperative landowner relationships (partnerships). In fact, the same can be said for other species featured in this booklet.

### **3. Record-Keeping Recommendations for Rio Grande Wild Turkeys:**

#### **a. Recommended record-keeping:**

The most important factor in producing trophy wild turkey gobblers is gobbler age. Because spur and beard length tend to increase with age, these factors are indicators of gobbler age. Records should be maintained on the weight, spur length and beard length of all gobblers harvested, as well as the proportion of Jakes (juvenile/yearling males) in the harvest. These will help managers determine whether the harvest consists of too many young animals to allow production of older, trophy animals. Normal population ratios are near 50/50 at hatch, and maintaining an annual log of observations in the early fall and late winter into March will assist in helping determine the relative abundance of mature gobblers and Jakes from year to year. Most hunters had rather take a mature bird than a “jake” gobbler, but either can be harvested and maintain management objectives.

It is important to maintain a map of the land with roost sites plotted and some details of which ones are primary winter roosts. It is a good practice to establish photo stations around roosts to annually update in early spring and late fall to monitor the condition of the roost site over a long period of time. Too often, we do not see change in front of our eyes unless we establish a means to record it. Roost trees must be replaced over time to maintain a healthy population.



# PROCEDURE FOR WINTER TURKEY ROOST COUNTS

Because of the unique nature of wild turkey biology and behavior, no good method currently exists for estimating wild turkey breeding populations. However, a general idea of turkey abundance can be obtained using winter roost counts, and that technique is presented here. Managers should remember that Rio Grande wild turkeys can move many miles between winter and summer range. Therefore, winter flocks will be composed of birds from many different ranches. Likewise, if a winter roost site is not present on a particular ranch, it is likely that ranches breeding birds will winter elsewhere.

The first step in conducting winter roost counts for Rio Grande wild turkeys is to gain an understanding of the species' behavior as it regards seasonal movements and winter flocking. During late fall, turkeys tend to congregate in traditional roosting areas. These sites are characterized by stands of large trees, usually oaks and pecans, and are often located in riparian zones. Examination of such sites in winter will reveal the presence of turkey roosts, either through direct observation of the birds in early morning or late evening, or through observation of droppings beneath the roost trees. Once the roost sites on a ranch have been identified, it is fairly simple to estimate the size of individual winter flocks using the following technique.

1. Determine the spatial extent to the roost site. Remember that flocks will often roost in different parts of a roost site each night. Therefore, it is important to determine total extent of the grove in which the flock roosts, so that the entire grove can be surveyed. Fortunately, roost sites in most of the Rio Grande turkey's range tend to be discrete stands of large trees in a landscape otherwise dominated by shrubs, small trees and open land.
2. Roost counts should be conducted during December-January, to ensure that birds are fully aggregated in winter flocks.
3. Turkeys usually leave their roosts very early in the morning. Therefore, it is important that counts be completed during the first hour of the day. Counts should commence as soon as there is sufficient light to silhouette birds against the morning sky. It often will be necessary to use multiple observers in order to survey a roost site completely in the one hour allotted.
4. Observation should be conducted on foot, disturbing the roost site as little as possible. For small or narrow sites, it might be possible to count the entire roost without entering the site. In most cases, however, observers will be required to walk through the grove. In such cases, it is important that observers cover the entire grove thoroughly and systematically, to ensure that all birds are counted, but that none are double counted. Remember, winter "flocks" will often break up into smaller groups for the night and roost in separate areas of a grove, so a thorough effort is important.
5. To get a precise estimate of flock size, multiple counts will be necessary. Precision of the estimate will increase along with the number of counts conducted. We recommend a minimum of five counts on each site. At this point, precision can be estimated and additional counts can be conducted if precision is judged to be insufficient (see the following sample data sheet).

### Data Sheet and Analysis

Following each day's count, enter the total number of birds observed (combining the counts of all observers) in the space provided in Column 1 on the data sheet. Once at least five counts have been completed, you may conduct the analysis as follows:

- A. Sum the entries in Column 1 and enter the total as Item 1.
- B. Enter the total number of days the roost was counted as Item 2.
- C. Subtract 1 from Item 2 and enter as Item 3.
- D. To determine the mean count size, divide Item 1 by Item 2 and enter as Item 4.
- E. Subtract Item 4 from each days count and enter in the corresponding space in Column 2, then square this amount (multiply it by itself) and enter it in the corresponding space in Column 3.
- F. Sum the entries in Column 3 and enter the total as Item 5.
- G. Divide Item 5 by Item 3 and enter the result as Item 6.
- H. Calculate the square root of Item 6 and enter the result as Item 7.
- I. Multiply Item 7 by 1.96 and enter the result as Item 8.
- J. Subtract Item 8 from Item 4 and enter the result as Item 9.
- K. Add Item 8 to Item 4 and enter the result as Item 10.
- L. Enter Items 9 and 10 in the space provided to determine the most likely size of the turkey flock at this roost site.

Item 1. Sum of All Counts = 707

Item 2. How many days were counts conducted? 5

Item 3. Item 2 - 1 = 4

Item 4. Mean Count = Item 1 ÷ Item 2 = 141.4

Item 5. Sum of Column 3 = 737.2

Item 6. Item 5 ÷ Item 3 = 737.2 ÷ 4 = 184.3

Item 7. The square-root of Item 6 = 13.58

Item 8. Item 7 x 1.96 = 26.6

Item 9. Minimum Estimate = Item 4 - Item 8 = 114.8

Item 10. Maximum Estimate = Item 4 + Item 8 = 168

	Date	Column 1 Number of Turkeys Counted on this Date	Column 2 Turkeys Counted Today Minus Item 4 (below)	Column 3 Square the Daily Result of Column 2
1	12/8	154	12.6	158.76
2	12/15	123	-18.4	338.56
3	12/25	155	13.6	184.96
4	1/1	134	-7.4	54.76
5	1/16	141	-0.4	0.16

**The most likely estimate of the actual size of the flock occupying this roost is**

between and 114.8 and 168.\*  
(Item 9) (Item 10)

If this estimate is not precise enough for your purposes (i.e., items 9 and 10 are too far apart), additional counts should yield a more precise estimate.

\*In statistical parlance, the above calculations yield a 95% confidence interval of the estimate of the flock size.)

**NOTICE:** Texas Parks and Wildlife Department receives federal financial assistance from the U.S. Fish and Wildlife Service. Under Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972, the U.S. Department of the Interior and its bureaus prohibit discrimination on the basis of race, color, national origin, age, disability, age or sex (in educational programs). If you believe that you have been discriminated against in any Texas Parks and Wildlife Department program, activity or facility or if you desire further information, please call or write either:

Texas Parks and Wildlife Department  
4200 Smith School Road  
Austin, TX 78744  
(512) 389-4800  
Attn: Lynn McDonald  
(complaints related to disability)  
Attn: Al Bingham (all other complaints)

The U.S. Fish and Wildlife Service  
Office for Diversity and Civil Rights Programs -  
External Programs  
4401 N. Fairfax Drive  
Webb 300  
Arlington, VA 22203  
(703) 358-1724

Complaint forms are available at Wildlife facilities. If you feel you have been discriminated against, please ask to speak to a Texas Parks and Wildlife Department manager.



4200 Smith School Road  
Austin, Texas 78644  
[www.tpwd.state.tx.us](http://www.tpwd.state.tx.us)