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WESTERN QUAIL MANAGEMENT PLAN 2009

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EXECUTIVE SUMMARY

The Western Quail Management Plan was created to provide range-wide and Bird Conservation Region (BCR) assessments of western quail population size, habitat abundance, current threats, management recommendations and research needs. The 6 species of western quail included in the Plan are California quail, scaled quail, Montezuma quail, mountain quail, Gambel's quail, and masked bobwhite. The northern bobwhite is present in the West but is excluded from this Plan because of the recent publication of the National Bobwhite Conservation Initiative. Five of the 6 species of western quail included in the Plan are fairly abundant game birds. The sixth species, masked bobwhite, is a federally listed endangered species and occupies only a fragment of its former range. Western quail occupy habitats from the shrublands of northwestern United States to the deserts of the Southwest. Throughout the ranges of the various species, quail abundance is a product of habitat availability and quality, and by extension, patterns and timing of rainfall. Habitat conditions and population densities were based on available data or the expertise of resource professionals knowledgeable of regional conditions and populations. Because comparable population estimates for each BCR were not available, harvest estimates were used to index population size. No Plan is complete without suggesting how to advance the conservation status of the species and management recommendations are included within each of the BCR descriptions and for the entire region. In general, western quail populations reflect long term changes in habitat condition. In some BCRs, quail populations are in long term decline because of changes in land use. In other BCRs, quail populations are stable, but can be increased with appropriate management of habitats, especially when focused on enhancement of a diversity of native shrubs and herbaceous plants. Management recommendations differ to reflect the different species and different landscapes occupied, but there are commonalities. Public land agencies can embrace the conservation of native quail by stepping down management recommendations from the Plan to establish specific management recommendations for land management unit plans. Habitat improvement in many locations may be obtained by balancing the level of livestock grazing to ensure benefits to quail by enhanced grassland and shrubland condition. Management to provide periodic disturbance is critical to some species. Control of invasive plants and promotion of diverse, native shrublands is essential throughout for all species. Recommendations for management of water distribution include enhancement of riparian areas and restoration of springs and seeps and, in some locales, construction of artificial water sources. Since reports of harvest index population change, improved surveys of harvest to produce comparable statistics between states and regions is critical to further assessments of quail conservation. Recommendations for research topics to improve the manager's knowledge of quail population dynamics are provided. As quail occupy some of the most arid regions of the U.S., responses of western quail to climate change and projected decreases in precipitation and increases in temperature need to be understood better. The Plan provides a benchmark for continued conservation of western quail. Updates to the Plan will be based on consistent assessment of population change and comparable tracking of management recommendations. A full version of the Plan can be accessed at westernquail.org.

INTRODUCTION

The Western Quail Management Plan (Plan) has been developed under the auspices of the Resident Game Bird Working Group of the Association of Fish and Wildlife Agencies. The development of the Plan is part of a continuing effort to establish species-specific or species-group conservation strategies to guide resource planning and on-the-ground habitat management initiatives.

The Plan utilizes the North American Bird Conservation Initiative's bird conservation regions (BCRs) as the geographic assessment unit to ensure consistency with other planning efforts that focus on avian species. BCR boundaries may be viewed at <http://www.nabci-us.org/bcrs.html>. Assessments are provided for those BCRs which represent the core range of western quail in the United States.

Species included in the list of western quail include California quail, Gambel's quail, scaled quail, Montezuma quail, mountain quail, and masked bobwhite (scientific names of plants and animals mentioned in the text are in Appendix A of the plan). While there are populations of northern bobwhite residing in some of the BCRs included in the Plan, northern bobwhite management needs were not included because of the existence of the National Bobwhite Conservation Initiative.

The geographic coverage of the Plan is limited to the United States portions of the range of western quail. Assessments of western quail populations in Mexico and Canada are not included in the Plan.

The primary objectives of the Plan are to provide indices of population and habitat and to assemble current assessments of threats, management recommendations, and research needs. Habitat conditions and population densities were based on available data or the expertise of resource professionals knowledgeable of regional conditions and

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populations. Comparable population estimates for each BCR were not available, and harvest estimates were used to index population size. In the arid West, both habitat quantity and habitat quality are highly variable because they are largely determined by rainfall. In wet years, habitat quantity may increase as quail are able to use areas they could not use in dry years. Habitat quality likewise changes with rainfall because the amount and distribution of rainfall determines the availability of food, cover, and water.

The Plan is organized to describe the natural history of each of the 6 species of western quail. Assessments and management recommendations are then included within each of the BCR descriptions. Only 4 of the 6 species are described in this summation of the Plan.

BIRD CONSERVATION - REGION 34: SIERRA-MADRE OCCIDENTAL

The Sierra Madre Occidental mountain range runs northwest to southeast parallel to the Pacific Coast, from the Mogollon Rim and isolated mountain ranges in southeastern Arizona and southwestern New Mexico through Sonora to central Mexico. It is characterized by high elevations and a complex topography with the presence of oak/pine, pine, and fir forests along the mountain range and of semiarid scrub habitats on eastern slopes. Most uplands in the United States portion of BCR 34 are publicly owned, but lower-elevation grasslands and riparian habitat are subject to development and conversion. The whole region is an important corridor for migration of many species in the West.

Montezuma Quail

Current Trend.—Current management of the majority of the Montezuma quail habitats in this BCR provide for a stable, overall trend in abundance with annual variation due to precipitation patterns. The majority of Montezuma quail habitats in this BCR fall under the jurisdiction of the Coronado National Forest.

Population Estimate Population Density.—No reliable population estimates exist for this species. Of all the North American quail species, Montezuma quail likely are the most difficult to detect and survey due to their secretive habits.

Desired Population Level.—Hunter effort and harvest will continue to be used as indices of Montezuma quail abundance. Total harvest in BCR 34 represents ~ 90% of the current harvest for this species. The desired population goal for Montezuma quail in BCR 34 is to maintain or improve habitat and abundance so that this population can support an average sustained harvest of at least 30,000 quail annually.

Management Issues Limiting Factors.—Limiting factors for this species in BCR 34 primarily involve precipitation and grass cover height. Livestock grazing has been a significant concern in this area in the past, but has lessened in recent years with the adoption of the Montezuma quail habitat guidelines by the Coronado National Forest.

Habitat Objectives.—The current distribution and abundance of Montezuma quail in BCR 34 will be maintained through continued application of the Montezuma quail habitat guidelines by the Coronado National Forest. Habitat objectives for BCR 34 include:

- continue to apply the Montezuma quail habitat guidelines throughout potential and occupied habitats,
- adjust livestock use downward during drought years, so the grass cover needs of this species are met,
- monitor and map invasive grass distribution,
- develop control strategies and manage invasive grass species to reduce their distribution, and
- convert potential Montezuma quail habitat areas with invasive grasses to native bunchgrass habitats.

Management Recommendations

- Manage grazed lands to maintain > 50% as horizontal canopy cover of grass.
- Manage grazed lands in Montezuma quail habitat to provide greater than 50 percent canopy cover of grass heights from 8 to 20 inches (20.3–50.8 cm) for escape, nesting, brood-rearing and roosting cover.
- Manage grazed lands habitat to maintain or improve species richness.
- Maintain or restore at least 5 native perennial bunchgrass species. Native forb and tree species diversity should be maintained or enhanced.
- Maintain the necessary security and thermal cover and the necessary microclimate for the forbs on which Montezuma quail feed. Manage fire and fuelwood programs to maintain a minimum of 25% tree canopy cover. Areas with tree canopy up to 75% are frequented by Montezuma quail.

Gambel's Quail

Current Trend.—While Gambel's quail do not reach the abundance found in BCR 33, they still are common throughout much of the lower elevations in BCR 34. Recent droughts, particularly during winter months, have reduced overall numbers of Gambel's quail. A return to more normal precipitation will increase abundance, provided habitat is protected from conversion.

The biggest threat to Gambel's quail is the rate at which the desert Southwest is being developed and rapid human population growth. In Arizona, a large portion of occupied Gambel's quail habitat has been facing the threat of urban development. Continued development will have major impacts on the species distribution, abundance, and harvest opportunity.

Population Estimate Population Density.—No reliable population estimates exist for this species in BCR 34. Trends in hunter harvest data and a few formal call-count surveys are the primary indices of abundance for Gambel's quail. Breeding bird survey data have been used as an additional trend index, although the data tend to be collected after the peak calling season for this species. Documented density estimates range from 0.11 bird per acre (0.27/ha) in poor years or habitats to 1.19 birds per acre (2.96/ha) during

years of peak abundance. Additional density estimate data are a management need for this species.

Desired Population Level.—Hunter harvest is used as an index of Gambel's quail abundance. Total average annual harvest in BCR 34 is roughly 100,000, the bulk of which is in Arizona. New Mexico contributes a small percentage of annual harvest in this BCR. The desired population level would maintain or enhance the current total Gambel's quail harvest in BCR 34.

Management Issues Limiting Factors.—The biggest threat to Gambel's quail is the rate at which the desert Southwest is being developed and rapid human population growth. In Arizona, a large portion of occupied Gambel's quail habitat is facing the threat of urban development. Continued development will have major impacts on the species distribution, abundance, and harvest opportunity.

Habitat Objectives.—Habitat recommendations, made by Partners in Flight (PIF), for Sonoran desert scrub will benefit Gambel's quail, as will recommendations for general habitat protection and acquisition and noxious weed control. Protection and enhancement of desert wash and riparian habitats are key to survival of this species, as is creation and maintenance of suitable ground cover characteristics. Habitat objectives for BCR 34 include:

- assess current habitat condition,
- identify and maintain minimum distance between water sources in appropriate areas; much of this area will require little additional water,
- protect existing Gambel's quail habitat in this BCR from further urban development,
- accommodate wildlife movement needs when planning developments, and
- develop and implement effective strategies to reduce noxious invasive plant species.

Management Recommendations

- Identify and encourage acquisition—by trade, fee-title purchase or conservation easement—of in-holdings within public lands that are of value to Gambel's quail and in danger of development.
- Work on legislation to protect state or federal lands from sale, trade or development. In Arizona, areas between Phoenix and Tucson are particularly vulnerable to further development at a vast scale, and they represent one of the most rapidly growing segments of the United States. These lands represent a large percentage of core range for Gambel's quail and for other Sonoran Desert species.
- Work with county and city zoning boards to ensure the needs of Gambel's quail and other wildlife species are met, including considerations for habitat connectivity and adequate patch size.
- Work with county and city zoning boards and land-management agencies to ensure lands remain open to quail hunting.
- Work with land-management agencies and other entities to reduce harmful invasive plant species and noxious weeds, with particular emphasis on control and eradication of certain species such as Lehmann's lovegrass and buffelgrass.

- Provide OHV users with areas that are poor wildlife habitat to conduct their activities. In other areas, restrict OHV use to existing roads and designated routes. Increase law enforcement to address resource concerns involving OHV users.

Scaled Quail

Current Trend.—Scaled quail apparently are declining throughout their range in response to habitat type conversions. Scaled quail abundance and distribution in Arizona is greatest in BCR 34. These birds are associated with Chihuahuan Desert grasslands of southeastern Arizona, particularly in the Sulphur Springs and San Bernardino valleys. Scaled quail also remain relatively common in suitable habitats east of Tucson, near the towns of Sonoita and Tombstone, and Buenos Aires National Wildlife Refuge. The population of scaled quail north of Oracle has declined dramatically due to habitat conversion. This population will likely be extirpated relatively soon due to planned developments in the area.

Population Estimate Population Density.—There are no reliable population estimates for scaled quail in BCR 34. Harvest statistics and breeding bird survey data are the only current population indices available. Calling of males is greatly influenced by spring and summer precipitation levels and is so variable that these data may be of little value. Density estimates for scaled quail vary from 0.016 to 1.01 per acre (0.04 to 2.50/ha). Additional density estimate data are a management need for this species in BCR 34.

Desired Population Level.—Hunter harvest will continue to be used as an index of scaled quail abundance in this BCR, although an independent index is a management need. This BCR represents the bulk of scaled quail harvest in Arizona, probably > 95%. Average annual harvest since 1991 is ~ 47,000, but has averaged significantly lower (~ 30,000) in recent years. The desired population goal for this BCR is to increase habitat suitability and abundance, so an annual average harvest of 45,000 can be supported.

Human development is increasingly reducing habitat availability for scaled quail but at a lower rate than for Gambel's quail. Invasive grass species and reduction of native perennial bunchgrass also negatively impacts the species.

Management Issues Limiting Factors.—The major limiting factors for this species involve drought and overuse of Chihuahuan grasslands by livestock and corresponding type conversion (grassland to shrublands). Human development is increasingly reducing habitat availability for scaled quail but at a lower rate than for Gambel's quail. Invasive grass species and reduction of native perennial bunchgrass also negatively impacts the species.

Habitat Objectives.—Habitat recommendations to benefit scaled quail and other desert grassland species in BCR 34 are provided in Latta et al. (1999). Protection and enhancement of desert grassland habitats are key to survival of this species, as are creation and maintenance of suitable ground cover characteristics. Provision of

water developments continues to be debated but may benefit this species in more arid portions of its range. Habitat objectives for BCR 34 include:

- assess current habitat condition,
- continue to assess and address shrub encroachment in the Sulphur Springs and San Bernardino valleys,
- re-establish native bunchgrass habitats where possible,
- identify and maintain minimum distance between water sources in appropriate areas,
- protect existing scaled quail habitat in this BCR from further urban development,
- accommodate wildlife movement needs when planning developments,
- develop and implement effective strategies to reduce noxious invasive plant species, and
- manage livestock levels to accommodate scaled quail

Management Recommendations

- Manage shrub and grassland components at appropriate levels to maintain existing suitable habitat.
- Modify existing livestock grazing to promote habitat conditions. Implement annual vegetation monitoring throughout the area to assess condition.
- Convert shrub-invaded grassland to proper condition. Shrub-reduction programs should be conducted in a manner that does not increase non-native invasive grasses.
- Work with land-management agencies and with other entities to reduce harmful invasive plant species and noxious weeds, with particular emphasis on control and eradication of species such as Lehmann's lovegrass and buffelgrass.
- Assess and address identified water-development needs.
- Identify and encourage acquisition—by trade, fee-title purchase or conservation easement—of private lands that are of value to scaled quail and in danger of development.
- Work on legislation to protect state or federal lands in the Southwest from sale, trade or development.
- Work with county and city zoning boards to ensure the needs of this and other wildlife species are met, including considerations for habitat connectivity and adequate patch size.
- Work with county and city zoning boards and with land-management agencies to ensure lands remain open to quail hunting.

Masked Bobwhite

Current Trend.—While no range-wide survey information exists, masked bobwhite populations have declined in central Sonora and on the Buenos Aires National Wildlife Refuge.

Population Estimate Population Density.—There is no good estimate of population numbers. However, population levels appear to be extremely low, perhaps nearing extinction.

Desired Population Level.—The Masked Bobwhite Recovery Plan (U.S. Fish and Wildlife Service 1995) considers the subspecies to be re-established when a

population of at least 500 masked bobwhites inhabit the Buenos Aires National Wildlife Refuge. At that point, a second site would be selected for the reintroduction of a second population.

In Sonora, the emphasis is on preserving and restoring two or more viable populations. Downlisting from endangered to threatened status would be considered when 4 separate, viable populations are established (2 in the United States and 2 in Mexico). They also would have to be maintained for 10 consecutive years.

Management Issues Limiting Factors.—Issues pertinent to the establishment of viable populations in Arizona include prolonged drought, invasion of velvet mesquite, prevalence and invasiveness of nonnative grasses (particularly Lehmann's lovegrass), lack of diversity of leguminous shrubs, and lack of winter rain. In addition, extremely high densities of predators (avian, mammalian, and reptilian) may be contributing to low population densities.

Sonoran issues are integrally related to extreme drought coupled with continued cattle grazing and the planting of buffelgrass for cattle forage. This has resulted in loss of plant diversity and, ultimately, bobwhite habitat.

Habitat Objectives.—Objectives for BCR 34 include:

- assess habitat conditions,
- reduce mesquite encroachment in desert grasslands,
- reduce nonnative grasses,
- re-establish native perennial bunchgrasses,
- establish native food plants, such as leguminous shrubs and native forbs,
- provide adequate hiding, thermal and nesting cover, either through native plants or artificial means, such as brush piles,
- assess water distribution and provide for water needs as necessary,
- assure adequate interspersions of food, cover and water needed,
- create or maintain stands of vegetation consisting of 15 to 30% woody vegetation, at least 15% forb cover, at least 15% native grass cover, and between 0 to 25% unobstructed bare ground,
- create or maintain diverse stands of native vegetation consisting of a minimum of 8 native perennial grass species, a minimum of 12 perennial forb species and a minimum of 3 midstory shrub or tree species, and
- manage livestock stocking rates and grazing regimes to permit co-existence of livestock and masked bobwhite.

Management Recommendations

Arizona

- Utilize prescribed fire to stimulate growth of forbs and seed-producing plants.
- Plant appropriate food or cover plants.
- Implement traditional habitat management techniques, such as disking, mowing and aeration to improve production of food plants.
- Create brush-piles or implement half-tree cutting to improve cover where needed.
- Provide and maintain water catchments and spreader dams wherever needed.
- Reduce cover of nonnative grasses and noxious weeds.

- Assess the predator base and implement reduction, if needed.

Mexico

- Establish conservation easements or purchase ranches in core bobwhite areas.
- Provide for movement corridors between populations.
- Reduce buffelgrass and re-establish native grass.
- Provide for water catchments in extremely arid areas.
- Reduce or eliminate grazing and develop rotational grazing systems for livestock in core bobwhite areas.
- Plant appropriate food or cover plants where needed.
- Implement disking, mowing, aeration and, possibly, prescribed fire to improve production of food plants.
- Support continued predator reductions if needed.

RECOMMENDED MANAGEMENT PRACTICES (for all species of quail)

Land Management Planning

- Step down management recommendations to establish specific targets within public land- management plan.

Land Management Practices

- Assess and recommend grazing management that benefits quail, such as deferment, rotation or rest.
- Maintain appropriate animal unit months (AUMs) on occupied quail range.
- Manage shrub and grassland component appropriate for scaled quail.
- Manage for early seral brush component for California quail and Montezuma quail.
- Maintain savanna characteristics in Madrean Archipelago for Montezuma quail.
- Increase dense roost site habitats for California quail.
- Restore native vegetation to riparian corridors by (a) controlling invasive plant species, e.g., saltcedar, leafy spurge, (b) managing forage removal, and (c) planting native species.
- Manage dense brush stands for diversity of stand density and edge effect to benefit California quail and Montezuma quail by establishing fire lanes in chaparral and scrub oak habitats.
- For all quail species, maintain and encourage native plants that provide critical invertebrate food sources for developing chicks.
- Develop Best Management Practices for “quail friendly” habitat treatment and incorporate them into land -use plans of public land managers, and farm bill conservation programs.

Invasive Species Management

- Control and prevent invasive annual grasses and noxious weeds.
- In appropriate habitats, encourage the use of prescribed fire or create let-burn policies, especially in mountain quail habitats. Managers should not use fire as a habitat-management tool when there is a risk of invasive species out-competing desired native vegeta-

tion unless active measures, such as spraying, are planned to control invasive plants.

- Feral hog control may be an important management practice in some quail ranges.

Conservation Programs

- Develop education programs and materials for the public regarding quail and the protection and enhancement of quail habitat.
- Take advantage of existing federal (e.g., farm bill) programs.
- Seek partnerships with landowners, land- management agencies and nongovernment organizations (such as Quail Unlimited, Quail Forever, and watershed councils) to improve quail habitat.
- Encourage community efforts to consider natural resource needs.
- Complete spatially mapping current distribution (occupied habitat) of each western quail species.
- Assess indices to population abundance that can replace harvest trends in those locations without regulated hunting seasons.
- Work with USDA native plant material centers to collect, store and develop new native plant stock for quail habitat. Identify remaining patches of quail habitat to serve as areas for collection of native seeds.
- Identify remaining patches of excellent quail habitat to serve as benchmarks for comparing and measuring success of habitat treatments.

Water Distribution and Allocation Policy

- Restore riparian areas.
- Restore seeps and springs.
- Develop and maintain natural ponds and artificial water sources (such as guzzlers and catchments) where needed.
- Provide both access ramps and escape ramps to existing watering facilities.
- Mitigate for over allocation of water resources.

Development Policy

- Encourage backyard habitat in urban settings.
- Ensure zoning and planning considers needs of wildlife.
- Encourage protection of farm and ranch lands.

Fragmentation Policy

- Create riparian corridors with associated vegetation.
- Improve connectivity of existing riparian corridors and shrub communities.

Harvest Policy

- Identify quail hunters to increase accuracy of harvest surveys.
- Structure hunting regulations to account for differences in distribution and population size
- Collect hunter-harvest information (e.g., wing collection).

Disturbance

- Manage dog training and trials, so impacts to reproducing quail are eliminated or reduced.

- Work with land-management agencies to manage OHV use to limit damage to habitat. Educate OHV users about impacts to quail and quail habitat.
- Restrict OHV use to designated trails.

Translocations

- Support intra- and interstate efforts to restore quail populations to suitable habitats.

Predators

- Reduce or eliminate feral mammals.

RESEARCH NEEDS (for all quail species)

Monitoring Protocol Development

- Continue to develop and refine reliable population indices that are independent of harvest data (e.g., call counts, pointing dog surveys, brood counts).

Population Dynamics

- Determine the benefit of free-standing water to quail throughout the year. Discover whether the addition of artificial water sources benefits quail populations.
- Investigate how Montezuma quail survive in the high elevation habitats of BCR 16 and 34.
- Learn whether seasonal migration occurs and, if so, what distances are traveled.
- Continue to update basic life-history knowledge for all western quail species.
- Assess quail density potential by habitat type and BCR.

Harvest Policy

- Refine harvest- survey techniques and apply them consistently throughout a species' range.
- Ascertain how late-season hunting affects breeding populations.
- Determine how hunting seasons affect bird abundance.

Predation Policy

- Conduct research into the effects of predation.

Habitat Policy

- Develop a habitat-assessment model in xeric landscapes for mountain quail.
- Conduct research regarding the effects of fire for various habitat types by species.
- Conduct research regarding the effects of timber production and harvest on quail species.
- Conduct research regarding the effects of grazing in various habitat types.

Translocation Policy

- Evaluate release techniques.
- Evaluate source population survival in various habitats.
- Evaluate various trapping techniques by species.

Recreational Use of Habitat

- Quantify effects of OHV use.

Development of Habitat

- Quantify the impacts of both urban and semi-urban developments.

Climate Change

- Responses of western quail to decreases in precipitation and increases in temperature need to be understood better.

Implementation

- Development of priority actions for funding (e.g., scaled quail and mountain quail habitats, consistent harvest data collection, implementation of individual state plans, etc).
- Develop metrics and methods to track accomplishments of the Plan.

Review and Update Process

- Recommend this plan be continuously reviewed and updated, with scheduled five year reviews.

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