CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES
OF WILD FAUNA AND FLORA

Twenty-fifth meeting of the Animals Committee
Geneva (Switzerland), 18-22 July 2011

Periodic review of animal species included in the CITES Appendices

REVIEW OF *COLINUS VIRGINIANUS RIDGWAYI*

This document has been submitted by the United States of America[*].

Review of *Colinus virginianus ridgwayi* (sp. Linnaeus 1785, spp. Brewster 1885) in the periodic review of species included in the CITES Appendices Resolution Conf. 11.1 (Rev. CoP15) and Resolution Conf. 14.8

INTRODUCTION

At the 22nd meeting of the Animals Committee (Lima, July 2006), the United States of America committed to evaluate of *Colinus virginianus ridgwayi* as part of the Periodic review of the species included in the CITES Appendices.

This subspecies occurs in Mexico and the United States of America. During our review, we consulted with representatives of the Government of Mexico (*Comisión Nacional para el Conocimiento y Uso de la Biodiversidad*), U.S. Fish and Wildlife Service (Arizona Ecological Services Field Office), and Arizona Game and Fish Department. All three provided information that was incorporated into this review and commented on earlier drafts.

DRAFT PROPOSAL TO AMEND THE APPENDICES (in accordance with Annex 6 to Resolution Conf. 9.24 (Rev. CoP15), as amended)

A. Proposal

Retain *Colinus virginianus ridgwayi* (masked bobwhite quail) in CITES Appendix I.

The subspecies meets the biological criteria for listing in Appendix I [Annex 1 of Resolution Conf. 9.24 (Rev. CoP15)], but is not affected by trade [as defined in Annex 5 of Resolution Conf. 9.24 (Rev. CoP15)], and is possibly extinct in the wild. Recovery efforts are ongoing.

B. Proponent

Switzerland, as the Depositary Government, on behalf of the Animals Committee (prepared by the United States of America)

[*] *The geographical designations employed in this document do not imply the expression of any opinion whatsoever on the part of the CITES Secretariat or the United Nations Environment Programme concerning the legal status of any country, territory, or area, or concerning the delimitation of its frontiers or boundaries. The responsibility for the contents of the document rests exclusively with its author.*

C. Supporting statement

1. Taxonomy

1.1 Class: Aves

1.2 Order: Galliformes

1.3 Family: Phasianidae

1.4 Genus, species or subspecies, including author and year:

Colinus virginianus ridgwayi (sp. Linnaeus 1785, spp. Brewster 1885)

1.5 Scientific synonyms:

None

1.6 Common names

Dutch	Zwartmaskerboomkwartel
English	Masked Bobwhite (Quail)
French	Colin de Virginie masqué
German	Ridgways Virginiawachtel
Italian	Colino della Virginia mascherato
Spanish	Codorniz cotuí

1.7 Code numbers:

None

2. Overview

Colinus virginianus ridgwayi occurs in Mexico and the United States of America and meets the biological criteria of Appendix I. This subspecies has a very small total population size, perhaps as many as 50 individuals in the wild, and each sub-population is also small. The subspecies occupies a very small geographic range of approximately 100-250 km^2 (NatureServe, 2010) which is fragmented to the extent that each sub-population is also isolated. *Colinus virginianus ridgwayi* has exhibited a long-term decline in conservation status. This subspecies appears to have specific habitat requirements, such as availability of shrubs for cover and certain forbs and seeds on which to feed (Arizona Game and Fish Department, 2001). The decline of the subspecies as a result of the loss and degradation of the grasslands in the Sonora region means that its successful recovery is tied to the restoration of this habitat. The subspecies is subject to very intensive management, in captivity as well as in the wild, but these recovery efforts have had limited success. There are no releases or re-introductions currently underway, but up to 300 captive individuals from the United States of America may be released into the wild in the Sonora region of Mexico within a few years (Robert Mesta, U.S. Fish and Wildlife Service, in litt., April 12, 2011). *Colinus virginianus ridgwayi* has not been recorded in legal trade during the last 10 years and there are no recent reports of illicit trade. There is a potential for trade to resume, however, given the cultural traditions of local residents, as well as demands by aviculturists. There is a captive population of several hundred individuals in the United States of America at the Buenos Aires National Wildlife Refuge that is subject to intensive management by the U.S. Fish and Wildlife Service Masked Bobwhite Recovery Team, but the future of the taxon remains uncertain. No wild specimens were detected during field surveys in both Mexico and the United States of America in 2009 and 2010 so the taxon may be extinct in the wild (Robert Mesta, U.S. Fish and Wildlife Service, in litt., April 12, 2011). In the United States of America, the subspecies is highly regulated by Federal and State measures (see below). This subspecies is listed as Endangered under the U.S. Endangered Species Act of 1973, as amended (ESA). In Mexico, the subspecies is also listed as Endangered (*En Peligro de Extinción*; reference: NOM-059-SEMARNAT-2010; Mexican CITES Scientific Authority, 2011), but these regulations have not been updated since 1994. By letter dated May 13, 2011, Mexican officials urged the implementation of precautionary measures and expressed support to retain this subspecies in Appendix I, citing scarce and vulnerable populations. The current Appendix I listing will allow recovery efforts to continue. Given these circumstances, the United States of America recommends that the subspecies be retained in Appendix I of CITES.

3. Species characteristics

3.1 Distribution

The subspecies occurs in northwestern Mexico and the extreme southwestern part of the United States of America (Figure 1).

Mexico:

The only native population of *Colinus virginianus ridgwayi* may be distributed around Benjamin Hill in the State of Sonora, Mexico (Hernández et al., 2006). Initial field surveys and interviews with people in the Sonora region during the 1960s led to the conclusion that there were only two populations in this area; a core population in the vicinity of Rancho El Carrizo, south of Benjamin Hill town, and another small population near Mazatán (Hernández et al., 2006). No further information has been obtained about the Mazatán population since the 1960s (Hernández et al., 2006).

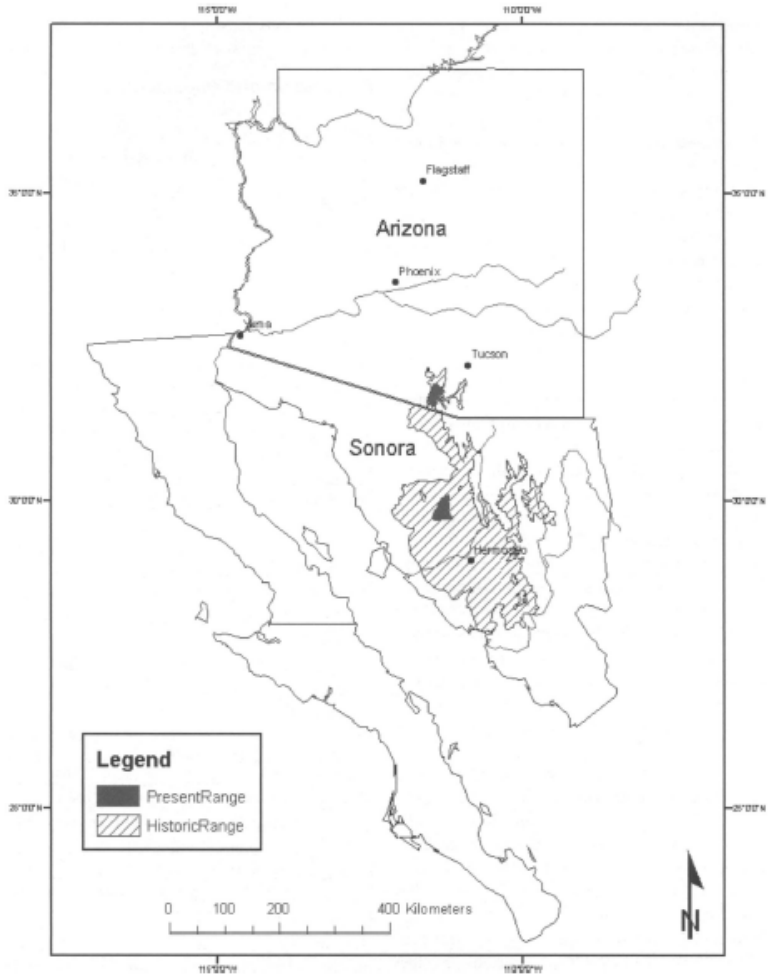

Figure 1. The historic and current distribution of masked bobwhite quail (taken from Hernández et al., 2006)

During a recent interview survey (2009), rural residents in former and current masked bobwhite regions reported sporadic sightings of the subspecies near Benjamin Hill and El Arpa in 2007-2009, as well as on other private ranches in the region (Ranchos Las Ánimas, Los Cuervos, Los Cochinitos, El Cúmaro, San Hipólito and the Picacho area; Reina-Guerrero and Van Devender 2010). Surveys undertaken in Mexico in 2010, however, did not record any evidence of the subspecies, including in those areas near Benjamin Hill (Eduardo Gómez-Limón, unpublished report to U.S. Fish and Wildlife Service Masked Bobwhite Recovery Team, 2010). According to Mexican CITES officials, this subspecies currently occurs only on a single Wildlife Management Area in the State of Sonora (reference: DFYFS-CR-EX-0423-SON; Mexican CITES Scientific Authority, 2011; see Section 6.2, below).

United States of America:

The only population in the United States of America has been reintroduced at the Buenos Aires National Wildlife Refuge (BANWR) in the southern Altar Valley in Pima County, Arizona (U.S. Fish and Wildlife Service [Arizona Ecological Services], 2002; Hernández et al., 2006). Captive-reared birds have been released in this refuge since it was established in 1985 (see section 8.1, below).

3.2 Habitat

Colinus virginianus ridgwayi is found in plains and river valleys where it inhabits desert grasslands with a mix of dense native grasses and forbs at an elevation of 300-1,200 m (U.S. Fish and Wildlife Service [Arizona Ecological Services], 2002; NatureServe, 2010). The subspecies requires a high abundance of forbs on which it can forage, as well as adequate brush cover for breeding and protection from predators (Guthery et al., 2000; Hernández et al., 2006, NatureServe 2010). It tends to use shrublands and patches with a low cover of woody vegetation during the autumn and winter, while in the summer it utilizes grasslands for breeding (Guthery et al., 2000, Hernández et al., 2006). Mean home range size of reintroduced *Colinus virginianus ridgwayi* in BANWR was estimated at 10.9 ha with core areas of 1.1 ha (Arizona Game and Fish Department, 2001).

3.3 Biological characteristics

Biology

In areas of moderate- to high-quality habitat, populations of *Colinus virginianus ridgwayi* tend to be sedentary and remain in one area throughout the year. If they are flushed from cover, they will fly away a short distance, perhaps turn, and glide back into cover (Arizona Game and Fish Department, 2001).

Reproduction

Colinus virginianus ridgwayi remain in groups (also known as coveys) of fewer than 20 individuals until late June when they form breeding pairs for a period of about 90 days (Hernández et al., 2006, Matthews and Moseley 1990; cited in NatureServe 2010). They nest on the ground in heavy cover during the late spring or early summer, but the nesting period can be disrupted or postponed if rains are delayed or absent (NatureServe 2010). The calling and nesting period lasts between 70 and 90 days. Each pair can produce a clutch size of 5–15 eggs, with hatching starting in late July and lasting until early November (Hernández et al., 2006, NatureServe 2010). The reproductive rate of *Colinus virginianus ridgwayi* is unknown (NatureServe 2010).

Mortality

The causes of mortality for *Colinus virginianus ridgwayi* include exposure to unsuitable environmental conditions as a result of deep winter snows or prolonged cold, as well as contact with pesticides and other contaminants in agricultural areas (Arizona Game and Fish Department, 2001). Adults, young and eggs are preyed upon by any opportunistic predator within the bobwhite's range, specifically Cooper's hawk (*Accipiter cooperi)* and mid-sized owls, as well as raccoon (*Procyon lotor)*, opossum (*Didelphis virginianus),* snakes and domestic cats and dogs. Few individuals survive for more than 5 years in the wild (Arizona Game and Fish Department, 2001).

Diet

Colinus virginianus ridgwayi feeds on a combination of seeds from a variety of plants, insects and green vegetation (Hernández et al., 2006). The seeds of the plant known as the unarmed acacia (*Acacia angustissima)* are a major food source for quail in winter, autumn and early spring (U.S. Fish and Wildlife Service [Arizona Ecological Services], 2002).

Genetic variability

There has been a lack of genetic study of bobwhite species (Hernández et al., 2006). Hernández et al. (2006) have documented a reduction in the genetic diversity of a closely related subspecies, *Colinus virginiaus texanum* (Texas bobwhite), which, like *Colinus virginianus ridgwayi,* exists in fragmented subpopulations. It is possible that *Colinus virginianus ridgwayi* subpopulations may also have reduced genetic diversity, a condition that may lead to reduced fitness.

3.4 Morphological characteristics

Colinus virginianus ridgwayi are small- to medium-sized birds and measure 21-26 cm total length with males being slightly bigger than the females (Arizona Game and Fish Department, 2001). The general markings of an adult male are a rufous/red breast with a black head and throat (see: http://ecos.fws.gov/speciesProfile, accessed on 14 December 2010). The upperparts are brownish and finely barred with tan and black and the forehead is white as is the superciliary stripe and triangular patch on the chin and throat which are visible against the chestnut crown and nape (Arizona Game and Fish Department, 2001). Variations in some adult males include a white- to yellow-white superciliary stripe with additional white flecks on the head and a crown that may be mottled black and rufous (see: http://ecos.fws.gov/speciesProfile, accessed on 14 December 2010). Males also have a slight head-crest that is raised in alarm (Arizona Game and Fish Department, 2001). The body plumage exhibits a mix of black, brown rufous and buff coloring (see: http://ecos.fws.gov/speciesProfile, accessed on 14 December 2010), and the wings are chestnut to brownish grey (Arizona Game and Fish Department, 2001).

Adult females have a mottled brown, buff and white plumage with a buff throat and superciliary stripe (see: http://ecos.fws.gov/speciesProfile, accessed on 14 December, 2010; AESFWS 2002). Juvenile plumage is similar to the female coloring but duller and less boldly marked (Arizona Game and Fish Department, 2001).

3.5 Role of the species in its ecosystem

Colinus quails play an important part in the ecosystem as seed and arthropod predators. They are also an important food source for other species of wildlife (Missouri Department of Conservation, 2003).

4. Status and trends

4.1 Habitat trends

Colinus virginianus ridgwayi has evolved in hot semiarid grasslands with pronounced precipitation peaks occurring during the summer (Hernández et al., 2006). The landscape cover across the ancestral range of *Colinus virginianus ridgwayi* has changed over time, with an increase in the non-native Lehmann lovegrass (*Eragrostis lehmanniana)* dominating a large area of the range in Arizona (Hernández et al., 2006). Drought has a significant short-term effect on *Colinus virginianus ridgwayi* habitat and intermittent drought conditions over the past 10—15 years have led to regular periods of reduced cover, forage and humidity (Scott Richardson, U.S. Fish and Wildlife Service, in litt., 2011). This change in habitat has negatively impacted reproduction and survival of *Colinus virginianus ridgwayi*. Woody plants and non-native buffelgrass (*Cenchrus ciliaris,* also known as *Pennisetum ciliare*) have also become established in Sonora, altering the habitat for Mexican populations (Hernández et al., 2006).

4.2 Population size

Population numbers for *Colinus virginianus ridgwayi* have reportedly fluctuated between 500-2,000 individuals over the last 20 years. In 1994, the total population size was fewer than 1,500 individuals (U.S. Fish and Wildlife Service 1994; Arizona Game and Fish Department, 2001). The population estimate for the subspecies in BANWR alone in 1995 was 300-500 individuals (U.S. Fish and Wildlife Service, 1995). In 2002, the entire population estimate was between 1,000 and 2,000 individuals but a survey conducted in 2005 provided a revised estimate of 500-800 individuals (Hernández et al., 2006). Surveys undertaken in 2010 – despite no detections – indicate even fewer birds in both the United States of America and Mexico, suggesting a total population of fewer than 50 individuals in the wild. There is great concern among species experts that *Colinus virginianus ridgwayi* is on the brink of extinction in the wild (Sally Gall, U.S. Fish and Wildlife Service, unpublished data, 2010).

4.3 Population structure

There is no information available regarding the population structure of *Colinus virginianus ridgwayi.* However, the population structure of another suite of subspecies, *Colinus virginanus* ssp. (Northern bobwhite), has been studied. Several studies have documented a male bias in the sex ratio of Northern bobwhite (Berger, 1995; Leopold, 1945). Berger (1995) showed that females were not more vulnerable to predation than males during the nesting season and suggested that the high male bias was a result of higher winter mortality of females. Studies have also found a greater proportion of the population consists of immature individuals (Berger, 1995). For example, Leopold (1945) found in a population of 1,633 individuals that 23.2% were adults and 76.8% immature.

4.4 Population trends

Precipitation and temperature variations influence the population dynamics of many quail species in the southwestern rangelands of the United States of America, with population numbers tending to increase from year to year during wet periods and decrease during drought (Hernández et al., 2006). The extent to which these environmental factors affect *Colinus virginianus ridgwayi,* however, is not clear. Camou et al. (1998; cited in Hernández et al., 2006) showed that bobwhite populations increased in 11 of 13 years when mean summer precipitation was greater than 20 cm and declined 13 out of 14 years when it was less than 20 cm. It has also been shown that survival and reproductive rates of *Colinus virginiaus texanum* populations, a closely related subspecies, decrease during drought conditions (Hernández et al., 2006). If *Colinus virginianus ridgwayi* is affected in a similar manner, then drought may limit reproductive effort by shortening the breeding and nesting periods (see Hernández et al., 2006). Recent observations over the past few years indicate that drought conditions are in fact having a negative impact on the *Colinus virginianus ridgwayi* population (Scott Richardson, U.S. Fish and Wildlife Service, unpublished report, 2010).

4.5 Geographic trends

The historic population range of *Colinus virginianus ridgwayi* covered a large proportion of the Sonora region in northwestern Mexico with a small extension into Arizona in the southwestern United States of America, where it was largely confined to a 110 km belt between the Baboquívari Mountains and the Santa Cruz Valley (Hernández et al., 2006). In Sonora, its ancestral distribution probably only extended as far south as southern Sonora with environmental factors such as decreased precipitation and changing habitat conditions limiting its distribution (Hernández et al., 2006).

5. Threats

Habitat loss

The biggest threat to *Colinus virginianus ridgwayi* in both Sonora (Mexico) and Arizona (United States of America) is habitat loss and degradation. Drought conditions combined with overgrazing by cattle have contributed to the loss of suitable habitat in Sonora and led to a decline in *Colinus virginianus ridgwayi* populations, as habitat-providing ground cover, nesting habitat and food resources have decreased (Ehrlich et al., 1992; cited in NatureServe, 2010; Hernández et al., 2006). In Sonora, 83% of the land is now dedicated to cattle ranching, placing *Colinus virginianus ridgwayi* in direct competition with cattle for some resources (Reina-Guerrero and Van Devender, 2010). Historically, grazing pressure and drought were considered the main reasons for the extinction of the subspecies in the wild in the United States of America (Hernández et al., 2006).

The loss of cover provided by woody and herbaceous vegetation in the *Colinus virginianus ridgwayi* range could also lead to an increase in exposure of the birds to aerial predators contributing further to population declines (Guthery et al., 2000). In addition, habitat loss may exacerbate competition with other species of quail for resources (U.S. Fish and Wildlife Service [Arizona Ecological Services], 2002), although there has been no recorded evidence of inter-specific competition between *Colinus virginianus ridgwayi* and two other sympatric species, Gambel's quail (*Callipepla gambeli)i* and scaled quail (*C. squamata)* (Hernández et al., 2006).

Habitat degradation

The introduction of non-native grass species such as buffelgrass and Lehmann lovegrass (*Eragrostis lehmanniana*) could be a threat to *Colinus virginianus ridgwayi* abundance, as their dominance in quail habitat may reduce plant and insect species diversity, as well as lower the germination rates of seed-producing plants (Hernández et al., 2006). Surveys conducted on the flora in the Sonoran Desert suggest that the introduction of buffelgrass has had a dramatic impact on the desert biota and reduced food resources (both plants and insects) of *Colinus virginianus ridgwayi* (Reina-Guerrero and Van Devender 2009). Further studies are required, however, to determine the exact level of threat as there have been contradicting reports which suggest that the grasses may actually be beneficial to quails in terms of providing escape and nesting cover (Hernández et al., 2006).

6. Utilization and trade

6.1 National utilization

In the United States of America, *Colinus virginianus ridgwayi* is listed as Endangered under the ESA. The ESA protects endangered and threatened species and their habitats by prohibiting the "take" of listed animals and

the interstate or international trade in listed plants and animals, including their parts and products, except under Federal permit. Take is defined in the ESA as “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct.” The terms “harm” and “harass” are further defined by regulation. Current data regarding national utilization in the United States of America are insufficiently detailed to suggest human use patterns. Given the scarcity of the subspecies, as well as its protected status, few if any specimens, however, are likely to be taken or used. According to Mexican CITES officials, this subspecies occurs on a single Wildlife Management Area in the State of Sonora and is subject to conservation activities (reference: DFYFS-CR-EX-0423-SON; Mexican CITES Scientific Authority, 2011). There are no data from Mexico regarding the national utilization or trade for consumptive purposes, but historically the subspecies was hunted or collected by aviculturists.

6.2 Legal trade

Data from the United Nations Environment Program-World Conservation Monitoring Centre (UNEP-WCMC), Conservation of International Trade for Endangered Species (CITES) trade database (2010) collected from 1975 to 2009 (the most recent complete year of data in the database) show that limited trade of *Colinus virginianus ridgwayi* occurred between 1982 and 1999 (Table 1; Attachment 1). In 1982, nearly 1000 live individuals, bred in captivity, were exported from the United States of America to Mexico for scientific purposes. A further four individuals were transported from the United States of America to Canada to be used for captive breeding. In 1984, 75 individuals were imported into the United States of America from an unknown origin for an unknown purpose. For several years thereafter, international trade did not occur.

Table 1. Summary report for Colinus virginianus ridgwayi (CITES trade statistics derived from the CITES Trade Database, UNEP-WCMC, Cambridge, UK; for additional details, see Attachment 1).

Period	**Activity**
1975-1981	No activity
1982-1984	Export of 988 live individuals from MX to US for Scientific purposes; Export of 4 live individuals from CA to US for Breeding purposes; Export of 75 live individuals from US to Unknown destination for an Unknown purpose
1993-1999	Export from US to MX of 144 dead birds; Export from US to MX of 906 items of meat
2000-2009	No activity

In 1994 and 1995 the numbers of *Colinus virginianus ridgwayi* exported from Mexico to the United States of America increased with 129 dead birds exported for commercial purposes in 1994 and exports of ‘meat’ in 1995. The most recent record of international trade in *Colinus virginianus ridgwayi* was in 1999 when 15 dead birds were taken from the wild in Mexico and imported into the United States of America for ‘personal’ purposes.

Hernandez et al. 2006 report an exportation in 1999 of 37 live birds captured in Sonora and released on the central portion of BANWR (Biol. Hesiquio Benítez Díaz, in litt., May 13, 2011). This information, however, is not included in UNEP-WCMC database and Mexican Management Authority could not verify the validity of this information.

The International Species Information System (ISIS) database (see: www.isis org; accessed on 31 January 2011) records four institutions, all in the United States of America, that maintain this subspecies in captivity, with no reports from institutions outside of the United States of America. The World Pheasant Association census database (see: http://wpa.serena-mueller.ch; accessed on 31 January 2011) reports a private collection in France contained the subspecies in 2008 and 2009, while three breeders held the subspecies in the United Kingdom between 2000 and 2003. Both databases rely on voluntary submission of records. In the 1980s the U.S. Fish and Wildlife Service sent second generation captive stock to a captive breeder in England, and their progeny still survive in Europe (Gary Robbins, in litt., 2011).

6.3 Parts and derivatives in trade

There are no current data to suggest that international trade of *Colinus virginianus ridgwayi* parts and derivatives is occurring.

6.4 Illegal trade

Illegal shipments of *Colinus virginianus ridgwayi* were seized upon entry into the United States of America in 1983 and 1993 (see Attachment 1). There are no current data showing illegal trade of *Colinus virginianus ridgwayi*.

6.5 Actual or potential trade impacts

There is no current information regarding trade impacts on *Colinus virginianus ridgwayi*. The subspecies is not currently in demand for international trade (not "affected by trade" as defined in Annex 5). Trade from the United States to Mexico is expected in the next few years to support the reintroduction efforts in Mexico (see Section 2). Were the subspecies to be delisted from the CITES Appendices or recovery efforts to be successful, there is a likelihood that additional trade would resume.

7. Legal instruments

7.1 National

Mexico:

In Mexico, the subspecies is listed as Endangered (*En Peligro de Extinción*; reference: NOM-059-SEMARNAT-2010; Mexican CITES Authority, 2011), but these regulations have not been updated since 1994.

United States of America:

Colinus virginianus ridgwayi is listed as Endangered under the ESA. This means that it is 'in danger of extinction throughout all or a significant portion of its range.'

7.2 International

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES): Appendix I.

8. Species management

8.1 Management measures

There have been several recovery efforts to increase the population of *Colinus virginianus ridgwayi* in the United States of America since 1937, but they have had limited success (U.S. Fish and Wildlife Service, 1995). Attempts to reintroduce the subspecies resulted in the establishment of the BANWR in 1985, which is within the historic range. A population of *Colinus virginianus ridgwayi* has been established using various processes including foster-rearing by sterilized wild Texas bobwhite, as well as livestock removal and habitat improvement (U.S. Fish and Wildlife Service, 1995). Between 1984 and 1994, 17,438 *Colinus virginianus ridgwayi* were released at BANWR, but due to a combination of insufficient rainfall and limited habitat management, the population fell to 300-500 individuals (U.S. Fish and Wildlife Service, 1995). Releases were put on hold from 2004-2009 in order to evaluate habitat conditions and population numbers more closely, but with habitat and outdoor flight pen improvements, releases have begun once again. Seasonal monitoring studies have been conducted on the population in BANWR as well as studies on their home range and vegetation (U.S. Fish and Wildlife Service, 1995).

A recovery plan was adopted and implemented beginning in 1995 with the objective of maintaining a viable population of *Colinus virginianus ridgwayi* on the BANWR site in Arizona and to preserve the populations in Mexico by restoring numbers to an optimal level in the remaining habitat (U.S. Fish and Wildlife Service, 1995). This recovery program is managed by the Masked Bobwhite Recovery Team that was formed in 2009 (Sally Gall, U.S. Fish and Wildlife Service, in litt., 2011).

In Mexico, population and habitat monitoring have taken place along with the establishment of cooperative breeding programs with agencies, institutions and ranchers (U.S. Fish and Wildlife Service 1995). The cooperative programs have been important for encouraging the positive management attitude of ranchers whose actions can specifically influence the survival of *Colinus virginianus ridgwayi* (U.S. Fish and Wildlife Service, 1995).

8.2 Population monitoring

Intermittent call counts of breeding males have been carried out in Sonora since 1968, but these have only detected a wild population on a ranch near Benjamin Hill town. In 2010, population and habitat surveys were conducted on other ranches in the Benjamin Hill area, but unfortunately no signs of *Colinus virginianus ridgwayi* were detected (Eduardo Gómez-Limón, unpublished report to U.S. Fish and Wildlife Service Masked Bobwhite Recovery Team, 2010). Efforts to evaluate population trends through surveys and interviews with people in various communities in Mexico continue. A more thorough habitat assessment is also taking place in Mexico (Sally Gall, U.S. Fish and Wildlife Service, unpublished data, 2010). Ongoing winter and summer surveys are carried out at BANWR to monitor the U.S. population (U.S. Fish and Wildlife Service, 1995).

8.3 Control measures

8.3.1 International

Other than CITES we are not aware of any specific international control measures for *Colinus virginianus ridgwayi*.

8.3.2 Domestic

Mexico: In Mexico, the subspecies is listed as Endangered (*En Peligro de Extinción*; reference: NOM-059-SEMARNAT-2010; Mexican CITES Scientific Authority, 2011), but these regulations have not been updated since 1994.

United States of America: At the Federal level, the subspecies is listed as Endangered under the ESA, and is also subject to the Lacey Act of 1900, as amended 22 May 2008. At the State level, the subspecies is managed as a non-game bird (Endangered; Wildlife Species of Concern in Arizona) by the State of Arizona and is not subject to harvest (Arizona Game and Fish Department, 1996, 2001).

8.4 Captive breeding and artificial propagation

At BANWR a captive breeding program of several hundred individuals has been set up to re-introduce *Colinus virginianus ridgwayi*, although both the breeding program and the releases have had mixed success. The Masked Bobwhite Recovery Team reviews the events, conditions and outcomes of the breeding facility regularly. The team is comprised of a group of scientific professionals who assist with the recovery of the subspecies by making recommendations to the U.S. Fish and Wildlife Service (Sally Gall, www.seazrocks.net/seazrocks.net/Bobwhite_Program.html; accessed on 3 March, 2011).

In 2010, an in-depth health assessment of the facility at BANWR was conducted by the San Diego Zoo. Recommendations were made to improve conditions and changes are being implemented. These improvements include reducing the density of birds in the facility and introducing a parent-rearing program that may reduce stress on captive *Colinus virginianus ridgwayi* leading to more successful reintroductions to the wild. The Recovery Team is actively pursuing an additional captive breeding site in the United States of America to reduce the risk of losing the species should an event, such as disease or natural disaster, occur that may put the captive population in BANWR in jeopardy. This will most likely be a partnership with a zoological institution (Sally Gall, U.S. Fish and Wildlife Service, unpublished report 2010).

A commercial firm known as Africam Safari, located in Puebla, Mexico, received funding in 2009 to build a new captive facility to house *Colinus virginianus ridgwayi* in that country. There are plans to transfer captive specimens to that facility in 2011 for research and release onto historical sites in Mexico. The Recovery Team is also working with private landowners in Mexico to transfer *Colinus virginianus ridgwayi* in summer/fall of 2011 (Sally Gall, U.S. Fish and Wildlife Service, unpublished report 2010).

Four other institutions within the United States of America (Arizona-Sonora Desert Museum, Chicago Zoological Society, Cincinnati Zoo and Botanical Garden and Utah's Hogle Zoo) have a combined total of 40 individuals of *Colinus virginianus ridgwayi* (see: www.isis.org, accessed 31 January 2011).

8.5 Habitat conservation

Colinus virginianus ridgwayi habitat, in general, is decreasing in quality and quantity. The only currently occupied protected area in the United States of America is BANWR, which is on the northern fringe of the subspecies' geographic range (Hernández et al., 2006) and covers 43,360 ha (U.S. Fish and Wildlife Service,

1995). Approximately 11,000 ha have been burned under controlled conditions to enhance the habitat and 20 ha of supplemental cover have been added (U.S. Fish and Wildlife Service, 1995). Since 2009, more-aggressive, mechanical habitat management has also taken place at BANWR, including mesquite removal, the creation of brush piles, aeration, disking and native plantings (Sally Gall, U.S. Fish and Wildlife Service, in litt., 2010).

8.6 Safeguards

Retention of the subspecies in Appendix I is recommended at this time. Were the subspecies to be reclassified in CITES, the taxon would continue to be regulated as an Endangered Species in Mexico under NOM-059-SEMARNAT-2010 (*En Peligro de Extinción;* Estados Unidos Mexicanos, 2010) and in the United States of America as Endangered under the ESA. These measures prohibit the take of *Colinus virginianus ridgwayi*. The lead Federal agency in the United States of America for actions regarding this bird is the U.S. Fish and Wildlife Service. The subspecies is also managed as a non-game bird (Endangered; Wildlife Species of Concern in Arizona) by the State of Arizona and is not subject to harvest (Arizona Game and Fish Department, 1996, 2001). In Mexico, the lead management agency is the Secretaría de Medio Ambiente y Recursos Naturales (SEMARNAT).

9. Information on similar species

New World quails belong to the family Phasianidae. Their external appearance is very similar to that of Old World quails and partridges (also part of the Phasianidae family). Genetic evidence, however, suggests that New World quails are not closely related to Old World (del Hoyo et al., 1994). Thirty two species of New World quail are distributed mainly in the southern part of the Neartic Region and the Neotropical Region (North and South America) (del Hoyo et al., 1994). Female *Colinus virginianus ridgwayi* are almost indistinguishable from *C. v. texanum* (Texas bobwhite) and closely resemble female and juvenile *Cyrtonyx montezumae* (Montezuma quail) (see: http://ecos.fws.gov/speciesProfile; accessed on 14 December, 2010; AESFWS, 2002). These species, however, are not listed in the CITES Appendices.

One other quail taxa is protected under the ESA but not subject to CITES. Merriam's Montezuma Quail (*C. m. merriami)* is listed as Endangered. In addition, gorgeted wood-quail (*Odontophorus strophium)* has been proposed as Endangered, according to the Service's ESA webpage (http://ecos.fws.gov/tess_public/SpeciesReport.do). A third, mountain quail (*Oreortyx pictus),* was evaluated and will not be listed.

10. Consultations

Ms. Sally Gall, Wildlife Refuge Manager, Buenos Aires National Wildlife Refuge, U.S. Fish and Wildlife Service; Mr. Scott Richardson, Arizona Ecological Services Field Office, U.S. Fish and Wildlife Service; and Mr. Robert Mesta, Masked Bobwhite Quail Recovery Team Leader, U.S. Fish and Wildlife Service; as well as Biol. Hesiquio Benítez Díaz from the CITES Scientific Authority in Mexico (CONABIO) were consulted for this periodic review and proposal.

11. Additional remarks

The Conservation Center for Species Survival (led by the San Diego Zoo Global and Fossil Rim Wildlife Center) is assisting the Masked Bobwhite Recovery Team by providing advice on habitat restoration and on the management of the captive flock.

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Attachment 1
Comparative tabulation report for *Colinus virginianus ridgwayi*
(CITES trade statistics derived from the CITES Trade Database, UNEP-WCMC, Cambridge, UK)

Year	Importer	Exporter	Import Quantity	Import Term	Import Purpose	Import Source	(Re-)Exp Quantity	(Re-)Exp Term	(Re-)Exp Purpose	(Re-)Exp Source
1975 -- 1981			0	--			0			
1982	MX	US					24	live	scientific	
1982	MX	US					964	live	scientific	bred in captivity
1983	US	MX	55	bodies		seized				
1983	CA	US	4	live	breeding					
1984	US	XX	75	unspecified						
1993	US	MX	1	bodies		seized				
1993	US	MX	20	bodies	commercial	seized				
1994	US	MX	129	bodies	commercial	unknown				
1995	US	MX	95	meat		unknown				
1995	US	MX	811	meat		wild				
1999	US	MX	15	bodies	personal	wild				
2000 -- 2009			0	--			--			