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AESO/SE  
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May 18, 2004

Memorandum

To: Acting Refuge Manager, Buenos Aires National Wildlife Refuge, Sasabe, Arizona

From: Field Supervisor, Arizona Ecological Services Field Office, Phoenix, Arizona

Subject: Reinitiation - Intra-Service Biological Opinion Regarding the Buenos Aires National Wildlife Refuge Fire Management Plan for the 2004 Burn Season

This memorandum is in response to your April 25, 2003, request for reinitiation of formal consultation on the ongoing implementation of the Buenos Aires National Wildlife Refuge's (Refuge) Fire Management Plan (FMP), Pima County, Arizona. In the April 30, 2002, Biological Opinion (BO) (U.S. Fish and Wildlife Service 2002), we evaluated effects of the proposed action on Pima pineapple cactus (*Coryphantha scheeri* var. *Robustispina*; pineapple cactus), cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*; pygmy-owl), masked bobwhite quail (*Colinus virginianus ridgewayi*; masked bobwhite), lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*), and mountain plover (*Charadrius montanus*) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq., Act). Reinitiation of consultation is requested because of changes in the proposed action that may alter the effects to the Pima pineapple cactus, cactus ferruginous pygmy-owl, and masked bobwhite quail [50 CFR 402.16(c)]. You have not requested reinitiation on the lesser long-nosed bat, as you do not feel the effects have changed. The mountain plover will not be included in the reinitiation, as we withdrew the proposal to list the plover as a threatened species under the Act (68 FR 53083).

This biological opinion was prepared based on information provided in your April 25, 2003, request for reinitiation of formal consultation; your February 18, 2004, revised Biological Assessment; and other sources of information as detailed in the consultation history and literature cited. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file in the Arizona Ecological Services Field Office, Phoenix, Arizona.

**Consultation History**

- February 5, 2002 Biological Assessment for the Refuge FMP

- April 30, 2002 Biological Opinion and concurrence for masked bobwhite quail, for the Refuge FMP
- April 25, 2003, Memorandum from Refuge requesting reinitiation of consultation.
- May 23, 2003, Memorandum from us to Refuge requesting additional information
- February 4, 2004, FMP consultation meeting at our Tucson sub-office
- February 18, 2004, Letter from the Refuge to us documenting additional information requested for reinitiation
- February 18, 2004, Request for reinitiation and revised Biological Assessment
- April 2, 2004, Memorandum on the use of the Refuge pineapple cactus habitat model to focus survey efforts
- April 28 2004, Memorandum responding to Refuge revised biological assessment of February 18, 2004.
- May 5, 2004, Email from Refuge Fire Management Officer identifying Burn Units (BU) proposed for prescribed fire this season
- May 11, 2004, Email updating the BUs proposed to be burned this season
- May 12, 2004, Email documenting the location of an early masked bobwhite nest in Middle Unit
- May 13, 2004, Telephone conversation with Refuge biologist discussing early nesting effort by masked bobwhite, and the effects this action may have on reproductive effort
- May 14, 2004, Draft BO transmitted via email to the Refuge for review.
- May 17, 2004, Email documenting suggested changes in the BO. The Refuge also removed the north half of Middle BU from this year's proposed burns to protect the known masked bobwhite nest.

## **BIOLOGICAL OPINION**

### **DESCRIPTION OF THE PROPOSED ACTION**

The proposed action remains the same as described in the BO (U.S. Fish And Wildlife Service 2002), except you proposed to change your fire rotation, add new BUs, combine existing BUs

(combined BUs), and use an aerial ignition system. Because you have not provided information on the changes to your fire rotation, we are unable to address the effects of the FMP in this BO beyond the 2004 fire season. We will address other aspects upon receipt of information requested. The proposed burns for 2004 fire season, Table 1, do not include any of the new BUs or any of the combined BUs, therefore the BO will only address the use of the aerial ignition system during the 2004 fire season.

Table 1. Proposed BU, with acres, to be burned in the 2004 prescribed fire season

Fires	Burn Unit(s)	Acres
1	High Gates	4,905
2	Middle (south of Middle Tank Road)	936
3	Garcia	2,440
4	Compartidero 2	1,194
5	Snake	1,664
6	Blanco	3,968
Total Acres (approximate)		15,107

### **Aerial Ignition System**

The ignition pattern for a BU analyzed in the BO did not include the use of an aerial ignition system. The analysis for the ignition of a BU included preparation of the BU by black lining the boundary and then igniting the unit from one end. This would result in one fire front creeping across the BU. The use of an aerial ignition system to ignite a BU as proposed includes active fire on the BU boundaries and an ignition pattern that zigzags across the BU. The BU boundary is ignited using drip torches, while a helicopter flying in a zigzag pattern over the BU drops incendiary “ping-pong balls.” This results in multiple active flamefronts throughout the BU surrounded by an active flame front along the boundaries of the BU. The flight path will allow a minimum of 1/4-mile distance between ignition lines across the BU.

### **Conservation Measures**

As part of all fire management actions, including preparation of BUs, the Refuge is committed to implementing certain measures devised to reduce effects of the proposed actions on listed species.

#### Pima pineapple cactus

- Surveys for Pima pineapple cactus will be conducted in each BU scheduled for burning prior to prescribed burns each year. The goal is to survey 100% of the habitat that has a high or medium potential for pineapple cactus based upon the Refuge GIS-based habitat model.

- Post fire surveys of up to 100% of the low potential habitat within a BU, as predicted by the model, will be conducted post-burn, and these data will be used to further validate the habitat model.
- The disposition of all known pineapple cactus will be determined post-burn and all data will be reported to the lead biologist in our office.
- Data collected as part of each survey will include: percent vegetative cover, map of the area surveyed, hours surveyed, number of people surveying, number of Pima pineapple cactus located, and UTM coordinates for each individual located. Pima pineapple cactus datasheets will be completed for each individual.
- All known Pima pineapple cactus will be marked and will be protected from fire by removing fuels around each pineapple cactus. Fuels will remain around the immediate vicinity of each cactus (approximately 2 feet in radius) but will be removed from the area between 2 and 11 feet beyond each cactus in a circular fashion. The amount of fuel to be cut and the width of the circle will depend on the fuel loads at each individual site. A fireproof, cone-like structure may be used as another way of protecting each plant.
- The Refuge will meet with Arizona ES biologists after this year's burns to evaluate the model and post-fire mortality. Potential changes in minimization measures and the use of the model will be discussed.

#### Cactus Ferruginous Pygmy-Owls

- Surveys for cactus ferruginous pygmy-owls will be conducted in all washes determined to have more than 5 large-diameter trees with cavities. GIS imagery was used to locate potential survey sites. Habitat quality will be verified through site visits.
- If an owl or owls occur within a proposed burn area at the time of a burn, the burn and all fire preparation work will be canceled for that year.
- During a prescribed burn, ignition patterns will be adjusted to divert fires away from all washes as best as possible to avoid burning trees bordering washes.
- All known saguaro cactus will be protected from prescribed fire by black-lining the perimeter of a 1-acre area around each cactus. The vegetation within the acre will be evaluated to determine if the fine fuels should be reduced as well (by mowing or cool burn) to reduce the chance of a spark jumping the line and burning the saguaro.
- Proposed pygmy-owl management zones on the Refuge will be finalized and incorporated into the Refuge pygmy-owl management plan within the next year. These management zones provide maximum protection of suitable nesting habitat and medium protection for a system of drainages that will provide connectivity through the Refuge. Minimum protection

zones will be primarily managed for restoration of native grasslands and reduction of upland mesquite. A final zone around the towns of Sasabe and Arivaca, and all Refuge buildings, will be managed for protection of people and property as part of a wildland–urban interface zone.

### Masked bobwhite quail

- The ignition pattern through a BU when an Aerial Ignition System is used will provide 1/4 - 1/2 mile distance between parallel lines of ignition.

## **PIMA PINEAPPLE CACTUS**

### **Status of the Species**

The status of the pineapple cactus remains unchanged from that described in the BO.

### **Environmental Baseline**

The environmental baseline is similar to that described in the BO, except that the Refuge conducted prescribed fires in 2003, and portions of the Refuge were subject to wildland fire in 2002. Continued surveys for pineapple cactus have resulted in the location of 121 additional individuals, and the continued refinement of the GIS-based habitat model has helped to focus survey efforts on the Refuge.

### **Effects of the Action**

The use of the aerial ignition system could result in the ignition of a pineapple cactus by a direct hit on a cactus or a hit within the buffer zone by an incendiary “ping-pong ball.” The likelihood of loss of known individuals from a “ping-pong ball” directly hitting a cactus or within the buffer zone, while low, is elevated over the ignition pattern analyzed in the BO.

The use of the predictive habitat model to concentrate survey effort in medium and high-quality habitat could result in the potential loss of a few individuals that are growing in low-quality habitat. The post-fire surveys of the low potential habitat will aid in evaluating risk of this approach for future fire seasons and to evaluate effectiveness of existing conservation measures. The concentration of effort in the high and medium quality habitat has resulted in a large number of new cacti being located. Conservation measures for this species will protect these individuals from advancing fire, but not necessarily from an incidental hit by the aerial ignition system as discussed above.

### **Cumulative Effects**

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Analysis of cumulative effects remains unchanged from the BO.

## **Conclusion**

Proposed changes to the Refuge FMP do not change our previous conclusion that the proposed action is not likely to jeopardize the continued existence of the pineapple cactus.

## **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

## **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Develop a monitoring program to determine the effectiveness of the FMP in controlling the spread of exotic grasses within the BUs. The monitoring should be of significant power to separate the effects of the FMP and climatic conditions on these grasses.
2. Develop a monitoring program that will determine the effects of exotic grass invasion on the post-fire disposition of pineapple cactus within the BUs.

## **CACTUS FERRUGINOUS PYGMY-OWL**

### **Status of the Species**

The status of the pygmy-owl up to the spring of 2002 is documented in the BO. Updates on the listing and the current status of the species are discussed in this document.

We published a proposed rule to redesignate critical habitat in the Federal Register on November 27, 2002 (67 FR 71032). The proposal includes approximately 1,208,000 acres in portions of Pima and Pinal counties, Arizona.

The plaintiffs in the original lawsuit challenging the listing of the pygmy-owl (National Association of Home Builders *et al.* v. Norton, Civ.-00-0903-PHX-SRB) appealed the District Court's ruling on the listing of the pygmy-owl as a distinct population segment. On August 19, 2003, the 9<sup>th</sup> Circuit Court of Appeals rendered an opinion regarding this appeal which held that, although the FWS did not arbitrarily find the Arizona pygmy-owl population to be discrete, the FWS arbitrarily found the discrete population to be significant. The judgement of the District Court was reversed and the case was remanded to the district court for further proceedings consistent with the 9<sup>th</sup> Circuit's opinion. Prior to being remanded to the district court, Defenders of Wildlife, intervenors on the original 2001 lawsuit, filed a petition with the 9<sup>th</sup> Circuit for rehearing, or, in the alternative, rehearing *en banc*. This petition was denied and the matter returned to the District Court, but no ruling has been issued, nor has the right to appeal been forfeited. At this writing, therefore, the pygmy-owl remains listed as endangered with proposed critical habitat.

Documentation of the total number of pygmy-owls and their current distribution in Arizona is incomplete. Survey and monitoring work in Arizona resulted in documenting 41 adult pygmy-owls in 1999, 34 in 2000, 36 in 2001, 24 in 2002, and, most recently, 21 in 2003 (AGFD 2002). The surveys and monitoring of pygmy-owls for 2004 are not complete at this time. The preliminary data at this time include 17 total individuals (Dennis Abbate pers. com.). Most of these pygmy-owls were distributed in four general areas: northwest Tucson, southern Pinal County, Organ Pipe Cactus National Monument, and the Altar Valley. We believe that more pygmy-owls exist in Arizona, but systematic surveys have not been conducted in all areas of potential habitat.

### **Environmental Baseline**

The environmental baseline of the pygmy-owl remains the same as described in the BO. Additional surveys on the Refuge have periodically located dispersing individuals, but no new nest locations. An inventory of saguaros and potential breeding habitat is ongoing. The Refuge has used this information to draft management zones for the pygmy-owl (see conservation measures). These management zones are the basis for the development of the Refuge pygmy-owl management plan.

## **Effects of the Action**

The use of an aerial ignition system could reduce fire effects on the habitat of the pygmy-owl. The zigzag ignition pattern results in multiple lines of fire that burn into each other. The spacing of these lines at 1/4 to 1/2 mile apart limits any head fire to a maximum run of 1/2 mile. This should reduce extreme fire behavior and provide more control of the prescribed burn. In addition, placement of ignition lines down-wind of washes will result in fire lines backing through washes. This adds a measure of protection to xeroriparian habitats valuable to pygmy-owls, without placing burn crews at additional risk.

The use of habitat evaluation criteria to determine where surveys should be conducted is an accepted method of concentrating survey efforts. The method used by the Refuge was not coordinated with us, and it has the potential to miss potential pygmy-owl nesting habitat. However, the BU for this year's burns contains only washes with dispersal habitat, the best of which were surveyed for two years according to the established protocol. In addition, the ignition pattern will keep any fire from entering major washes. Therefore, this year's proposed burns are not likely to have direct effects on a pygmy-owl or a pygmy-owl nest.

## **Cumulative effects**

Analysis of cumulative effects remains unchanged from the BO.

## **Conclusion**

Proposed changes to the Refuge FMP do not change our previous conclusion that the proposed action is not likely to jeopardize the continued existence of the pygmy-owl.

## **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. "Take" is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. "Harm" is defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.



### **Amount or Extent of Take**

We do not anticipate the proposed action will incidentally take any pygmy-owls. We base this conclusion on the following:

- Surveys will be conducted prior to burns to avoid direct impacts of pygmy-owls in suitable habitat.
- Prescribed burns will be cancelled in a BU if a pygmy-owl is found.
- Washes used by pygmy-owls will be protected from the effect of prescribed burns.
- Ignition patterns will be adjusted to avoid burning trees in and along washes.
- All known saguaro cacti will be buffered by a protection area.
- Fuel reduction activities may occur to avoid uncontrolled spot fires within the buffer around saguaro cacti.

### **Conservation Recommendations**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. The draft pygmy-owl management zones and proposed management of these zones should be finalized in the Refuge pygmy-owl management plan prior to the 2005 fire season in cooperation with us.
2. The Refuge should work with us to develop effective habitat evaluation criteria to focus survey efforts.

In order for the us to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

### **MASKED BOBWHITE QUAIL**

#### **Status of the Species**

We listed the masked bobwhite as endangered with the original passage of the Endangered Species Conservation Act of 1969 (Public Law 91-135; 83 Stat.275); the Act. Shortly after specimens were first collected in 1884, masked bobwhites were essentially extirpated from

Arizona (and the United States) by 1900. In the U.S., the species was generally associated with the Santa Cruz and Altar valleys of southeastern Arizona (U.S. Fish and Wildlife Service 1995). Critical habitat is not designated for this species. A recovery plan for the masked bobwhite exists and has been revised several times (U.S. Fish and Wildlife Service 1995).

The masked bobwhite was historically restricted to level plains and river valleys in Sonora, Mexico, and in extreme south-central Arizona at elevations ranging between 490 and 3,940 feet (U.S. Fish and Wildlife Service 1995). Mean annual rainfall on historical habitat during summer monsoon ranges between 12 to 16 inches; 75 percent of that rain falls between July through September, annually (Brown and Ellis 1977). Rainfall patterns in Sonora, Mexico, at Rancho El Carrizo (a masked bobwhite population location), averaged 14.6 inches (37.1 cm) between 1956 to 1994. About 54 percent of the average rainfall occurs there between July and August, annually (Guthrery, *et al.* nd).

In Goodwin's study (1982) of reintroduced masked bobwhite on the Buenos Aires Ranch, Arizona (now the Refuge), masked bobwhite appeared to prefer areas supporting between 446 to 892 lb/ac grass and 267 to 714 lb/ac forb weight. This is a rough range of 700 to 1600 lb/ac of total herbaceous plant biomass. The number and diversity of plant species and the ground cover they provided appeared more important to the masked bobwhite's needs than merely sheer amount or weight of plant material. Sites containing less than 10 percent grass cover were avoided by the birds; their preferred habitat supported between 22 to 30 percent grass cover. With few exceptions, masked bobwhite were not seen in areas with less than 10 to 12 species of grasses and forbs, and the areas supporting the best masked bobwhite populations generally contained between 18 to 20 plant species. In this study, several coveys emigrated when the grass-forb understory was grazed to 357 lb/ac and between 4.0 and 4.75 inches in height. Masked bobwhites were generally absent from areas with less than eight percent shrub cover; areas containing between 15 to 30 percent shrub overstory were preferred by the birds. Mesquite with a basal diameter of less than 2.5 inches with low, pendulous branches, are believed to provide the most ideal shrub cover for the species.

Goodwin (1982) used four criteria for determining potential of masked bobwhite habitat suitability in order to evaluate potential release sites; all four had to be met in order for the habitat to be considered suitable. They were: 1) minimum of 10 percent basal ground cover by perennial grass; 2) minimum of 10 percent basal ground cover by forbs after summer growing season; 3) species diversity to include a minimum of 10 grass and 10 forb species commonly dispersed throughout the area; 4) shrub cover to provide 10 to 30 percent canopy cover. Sites evaluated were the Buenos Aires Ranch in Altar Valley, the southern portion of the Avra Valley, Rio Rico Properties and the Canoa Ranch in the Santa Cruz Valley, Sopori Wash, Empire Ranch, and the Audubon Research Ranch, all located in southern Arizona.

Home range, habitat use, and movements of reintroduced masked bobwhites were studied from 1986 to 1988 on Refuge (Simms 1989). Home ranges averaged 27 acres (a range of 12.8 to 36.0 acres). The majority of masked bobwhite studied moved less than 0.6 mile between their release site and the site of their first trapping. Movements of masked bobwhite up to eight miles from release sites were recorded (Kuvlesky 1998).

In Sonora, Mexico, wild masked bobwhite breeding starts in July when the summer monsoon rains begin (Tomlinson 1972). His earliest sightings of young birds occurred in late September. The bird's breeding, nesting, and hatching cycle is timed to coincide with the annual production of green feed, the growth of concealing cover, and the availability of invertebrate food sources and plant seeds produced by the summer rains. For breeding activity to begin, humidity levels had to exceed 70 to 90 percent (Kuvelsky *et al*, draft manuscript, nd; Kuvelsky 1998).

Masked bobwhite restoration efforts continue on Refuge, with new release techniques being devised and implemented in an effort to improve released birds' survival chances in the wild. Some success has been realized, but a viable, wild population remains to be achieved. Masked bobwhite reintroduction efforts continue on Refuge, and results are extrapolated by use of annual call-counts conducted by Refuge personnel. In fall of 2002, masked bobwhite numbers appeared to be stable and the same as in the prior five years, hovering at about 150, which includes audible responses and counted birds from covey flushes.

### **Environmental Baseline**

The reintroduced individuals on the Refuge make up the only known population in the United States. The Refuge continues to breed and release more individuals. The population has been monitored continually using summer call counts. The population on the Refuge has remained relatively stable at approximately 150-300 individuals. Five nests have been observed on the Refuge (Simms 1989, Sally Gall pers. com.). One of these observations was in late April of 2004, several months prior to the typical nesting period of July.

Prescribed fire has been used to manage masked bobwhite habitat on the Refuge since it was established. A description of the Altar Valley and the habitat on the Refuge is in the BO.

Table 2. Results of summer call count surveys from 1999 to 2003 for BUs proposed for 2004 prescribed burns. Data are the number of calling males heard from the units and are from a series of maps produced to show fire history and masked bobwhite numbers by BU.

Fire Management Unit	1999	2000	2001	2002	2003	Maximum Occupancy
High Gates	0	0	0	0	0	0
Middle	7.5	0	3	5	9	9
Garcia	0	0	1	0	0	1
Compartidero 2	1	0	2	2	0	2
Snake	0	0	1	0	0	1
Blanco	0	0	0	0	0	0

The purpose of establishing the Refuge was to reestablish and recover this species. The Refuge has been in existence since 1985. Most of the factors identified as having lead to the extirpation of this species are no longer present on the Refuge, including unregulated hunting and poorly

managed grazing. The exception to this is along the Mexican border where trespass livestock have degraded habitat condition. Other Factors that may be affecting this species are the loss of the historical bottomlands habitats with the down cutting of the Brawley Wash, and the invasion of mesquite into the Upland habitats. Lehmann lovegrass is increasing and replacing native perennial grass species. The native grasses may provide a more useable food supply based upon seed size.

While human disturbance due to recreation is relatively light on the Refuge, illegal immigration across the Refuge has resulted in extensive habitat damage through loss of vegetation along roads and trails being cut across the Refuge. In addition, illegal immigrants in need of help have started signal fires that have resulted in major wildland fires.

### **Effects of the Action**

Direct effects of the proposed burns include the low probability of mortality due to direct hit by a “ping-pong ball” and a greater likelihood of entrapment within a BU by multiple advancing flame fronts. The ignition pattern results in active blacklines along the perimeter of the BU, while the BU is ignited using an aerial ignition system. This results in a series of parallel, active flame fronts moving toward one another within the burning blacklines. Due to the relatively hot prescriptions needed to kill mesquite, the associated flame lengths, and the heat produced over the flame fronts, it is unlikely any masked bobwhite in the BU will escape.

It was originally thought that burning in May and June would avoid impacting any reproduction of established masked bobwhite. Reproduction is typically associated with monsoon rains. However, recent observations of an active nest in late April (Mary Hunnicutt pers. com.) suggest that some early reproductive effort occurs prior to monsoon rains. Any nests on the ground are likely to be destroyed in the BU burned in May and June.

In addition, while fire is beneficial to masked bobwhite habitat, the indirect effects of these burns will include the temporary loss or degradation of habitat and a potential loss of invertebrates used during the feeding of hatchlings during the summer. Fire also results in removing cover which could result in indirect effects due to higher rates of predation by aerial predators. While long-term effects of the fire will reduce mesquite invasion of upland habitat and result in a beneficial renewal of the grassland habitats, the burning of these habitats during the current drought cycle could result in delayed recovery of perennial grasses and extended negative effects of habitat degradation for multiple seasons. However, the BUs to be burned this year are widely dispersed throughout the available masked bobwhite habitat, thus reducing the effects to habitat.

### **Cumulative Effects**

Analysis of cumulative effects remains unchanged from the BO.

## **Conclusion**

After reviewing the current status of masked bobwhite, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the masked bobwhite. No critical habitat has been designated for this species; therefore, none will be affected. In making our determination, we considered the following:

- The status of masked bobwhite has remained relatively constant on the Refuge for the past five years with approximately 300 individuals making up the reestablished population.
- Captive breeding of masked bobwhite has continued to provide individuals to augment the reestablished population.
- The majority of the available masked bobwhite habitat on the Refuge will not be included in the proposed burns.
- The current distribution of the burns within the action area provide adequate habitat for the existing population of masked bobwhite on the Refuge and for those likely to be released this year.
- The cumulative effects in the action area are not anticipated to increase significantly over the life of the project.

## **INCIDENTAL TAKE STATEMENT**

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The measures described below are non-discretionary, and must be undertaken by the Refuge so that they become binding conditions of any grant or permit issued to the Refuge, as appropriate, for the exemption in section 7(o)(2) to apply. The Refuge has a continuing duty to regulate the activity covered by this incidental take statement. If the Refuge (1) fails to assume and

implement the terms and conditions or (2) fails to require the (applicant) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Refuge must report the progress of the action and its impact on the species to us as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

### **AMOUNT OR EXTENT OF TAKE**

We have developed the following incidental take statement based on the premise that the action will be implemented in its entirety. The amount of take is based upon the worst-case scenario for the proposed action. We anticipate the potential loss of up to all individuals within a BU due to an inability to escape advancing fire fronts. The level of take is based upon the following:

#### **Adults**

- The maximum known occupancy of a BU since 1999, based upon call count data in Table 2.
- We assume a 50% response rate of male birds to call count surveys.
- We assume a 1:1.5 sex ratio and that only males respond to call count surveys.
- We assume the prescription used will result in flame lengths greater than 24 inches.
- We assume that 60% of the area of a BU will be affected by fire.
- We assume 30% of the adults within a BU will be taken by active flame fronts and the intense heat based upon the mobility of the adults.

#### **Early Nesting:**

- We assume the number of females estimated to be in the BUs, based upon the previous assumptions, to be 39.
- We assume that only 25% of the females will nest early.
- We assume that 60% of the area of a BU will be affected by fire.
- We assume 60% of the eggs or chicks in the BUs will be taken by fire.

These assumptions are based upon the known biology of the species and personal observations of Refuge staff.

Therefore, the level of take anticipated is:

- All adult masked bobwhite within the six BUs within masked bobwhite habitat will be taken by fire. We estimate take to be up to 20 adult individuals.
- All nests within the six BUs within masked bobwhite habitat will be taken by fire. We estimate take of up to 6 nests, including all eggs and/or hatchling masked bobwhite in these nests.

This is the total level of take anticipated for the proposed actions as described in the Description of Proposed Actions section of this opinion.

### **Effect of the Take**

In this biological opinion, the FWS determined that this level of anticipated take is not likely to result in jeopardy to the species.

### **Reasonable and Prudent Measures and Terms and Conditions**

In order to be exempt from the prohibitions of section 9 of the Act, you must comply with the following terms and conditions, which implement the reasonable and prudent measures described below and outline required minimization and reporting/monitoring requirements. These terms and conditions are non-discretionary.

1. You shall monitor incidental take resulting from the proposed action and report to us the findings of that monitoring. Include observations on fire behavior, document fire prescription readings, and document behavior of all quail species in response to the prescribed fire.
  - Report to us by February 15, 2005, the extent of the burns, results of all surveys for masked bobwhite, and the effectiveness of conservation measures; include all observations of any species of quail escaping from prescribed burns.
2. Minimize effects of fire on early-season masked bobwhite nests.
  - If the locations of nests are known, exclude these areas of the BU from the prescribed burn to the best of your abilities, considering the importance of fire containment and burn crew safety. The Refuge shall implement one of the following: 1) burns in a BU with a known nest shall be postponed until there is a reasonable likelihood the eggs have hatched and the chicks are mobile, 2) the portion of the BU that contains the nest shall be removed from the proposed burn by use of fire lines or other natural fire breaks, 3) the burn shall be cancelled for this year, or 4) a protective area shall be established around the nest with a broad connection to an adjoining unburned BU.

The reasonable and prudent measures are designed to minimize or avoid the impact of take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation

of consultation and review of the reasonable and prudent measures provided. The refuge must immediately provide an explanation of the causes of the taking and review with us the need for possible modification of the reasonable and prudent measures.

### **Disposition of Dead or Injured Listed Species**

Upon locating a dead, injured, or sick listed species initial notification must be made to our Law Enforcement Office, 2450 W. Broadway Rd. #113, Mesa, Arizona 85202 (480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this us. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible condition. If feasible, the remains of intact specimens of listed animal species shall be submitted as soon as possible to this us or the nearest Arizona Game and Fish Department office, educational, or research institutions (e.g., University of Arizona in Tucson) holding appropriate State and Federal permits.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution before implementation of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any treated listed animal survive, we should be contacted regarding the final disposition of the animal.

### **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We recommend the following:

1. Document all survey efforts and data on Pima pineapple cactus in the annual report under the Terms and Conditions for the masked bobwhite take statement.
2. Document all pygmy-owl surveys in the annual report under the Terms and Conditions for the masked bobwhite Take Statement.
3. Evaluate the existing Refuge prescribed fire program and its long-term effects on recovery of masked bobwhite. Specifically, evaluate whether the benefits of prescribed fire outweigh the short-term impact to the population of masked bobwhite.
4. Review all available data on masked bobwhite to refine the assumptions used in this BO's take statement for masked bobwhite. Promote research into the validity of any assumptions that cannot be refined by existing data.



5. Develop a more programmatic approach to burning BUs within masked bobwhite habitat prior to the 2005 fire season.
6. Support or encourage research into fire effects on habitat regeneration and invertebrate food availability.
7. Experiment with the use of mechanical and chemical mesquite control in BUs where high numbers of masked bobwhite are known to occur.
8. Postpone burning BUs when high concentrations of masked bobwhite are present, based upon the previous year's call count surveys.

In order for us to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

#### **REINITIATION NOTICE**

This concludes formal consultation on the proposed 2004 prescribe fires under the Refuge FMP. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have questions regarding this Biological Opinion, please contact Marty Tuegel (x 232) or Sherry Barrett (x 223) at (520) 670-6150. Please refer to consultation number 02-21-02-F-0068 in future correspondence concerning this project.

/s/ Steven L. Spangle

cc: Bob Broscheid, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ  
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ (Attn: Joan Scott)  
Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)  
(Attn: Sarah Rinkevich)

Assistant Regional Director, National Wildlife Refuge System, Fish and Wildlife Service,  
Albuquerque, NM  
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

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FIGURES

Figure 1. Fire Management Units proposed to be burned in 2004

