



United States Department of the Interior



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In Reply Refer to:
AESO/SE
22410-2005-F-0243-R003

February 1, 2011

Memorandum

To: Refuge Manager, Buenos Aires National Wildlife Refuge, Sasabe, Arizona 85633

From: Field Supervisor

Subject: Biological Opinion for the Reinitiation of Section 7 Consultation for Buenos Aires National Wildlife Refuge Fire Management Plan 2005-2008 for the 2011 fire season

Thank you for your request for reinitiation of formal consultation on the Buenos Aires National Wildlife Refuge (BANWR) Fire Management Plan (FMP) 2005-2008 with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated December 3, 2010, and received by us on December 3, 2010. At issue are impacts that may result from the proposed additional one year extension to the 2005-2008 FMP on the BANWR located in Pima County, Arizona. The proposed action may adversely affect the endangered Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), the endangered masked bobwhite quail (*Colinus virginianus ridgewayi*), the threatened Chiricahua leopard frog (*Lithobates [=Rana] chiricahuensis*), and the endangered Gila topminnow (*Poeciliopsis occidentalis occidentalis*).

As in 2010, you requested our concurrence that the proposed action is not likely to adversely affect the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*). In addition, you have determined that the proposed action is not likely to adversely affect the candidate northern Mexican gartersnake (*Thamnophis eques megalops*). We concur with your determinations and our rationale is provided in Appendix A.

This biological opinion is based on information provided in the February 2, 2010 and December 3, 2010, reinitiation requests, the biological assessment and biological opinion for the 2005-2008 FMP, section 10(a)(1)(A) research and recovery permit reports, telephone conversations, field investigations, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, fire management, and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation History

- May 20, 2005 – We issued a final BO for the 2005-2008 BANWR FMP, AESO 22410-2005-F-0243
- December 3, 2010 - BANWR sent request to reinitiate the consultation for the 2005-2008 BANWR FMP, AESO 22410-2005-F-0243, to extend the FMP to cover the 2011 fire season. BANWR indicated that this should be the final extension request as a new FMP is being developed in 2011.
- February x, 2011 – Final BO sent to BANWR.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is a third one-year extension of the 2005-2008 BANWR FMP for the 2011 fire season. Details on the implementation of the proposed prescribed burns are described in the original FMP (USFWS 2001a) and Biological Evaluation (USFWS 2001b), 2002 BO (USFWS 2002), 2003 reinitiation Biological Evaluation (USFWS 2003), 2004 BO (USFWS 2004), 2005-2008 Biological Evaluation (USFWS 2005a, 2005b) and the 2005 BO (USFWS 2005c). The descriptions of the proposed project are incorporated here by reference. This reinitiation is requested due to the inability of BANWR to complete their new FMP prior to the 2011 burn season. BANWR is developing a new FMP that is consistent with the goals and objectives of the HMP. The timing of the development of the new FMP and the subsequent approvals will not be completed in time to implement the proposed 2011 burns and, thus, reinitiation of the existing FMP is needed to cover the 2011 burns.

The BANWR proposes an acreage cap of 8,999 acres for burns planned in 2011 (See Table 1). This acreage will help achieve HMP objectives and includes the following plan components:

- Helicopter aerial ignitions will not be used for the 2011 prescribed fires. All burns will be ignited using hand ignition techniques on the perimeter of each respective burn unit which will ensure the greatest degree of burn mosaic. Occasionally, internal burn lines will be ignited by hand in the event that the perimeter burns are impeded and if this can be accomplished without placing additional safety risks to fire personnel.
- The acreage cap of 8,999 acres of grassland area is below the 14,000-acre limit included in the 2005 BO.
- Fire may move into buffer areas beyond the perimeter of the target BUs without the need to declare the burn a wildland fire. Fires entering the buffer areas will be subject to the full range of suppression activities. Any acreage in a buffer area that is burned is counted towards the 8,999 acre burn cap.
- Conservation measures for affected species will be implemented

Conservation Measures

The following measures will be taken by the BANWR as part of the action to reduce adverse impacts to and conserve listed species:

Pima Pineapple Cactus

Surveys for Pima pineapple cacti will be conducted in high and medium probability areas, as predicted by the BANWR Pima pineapple cactus predictive model, in each BU scheduled for burning if the habitat in the unit has not been completely surveyed within the past 5 years. In addition to surveying the high and medium probability areas, areas deemed to be appropriate, but not predicted by the model, will also be surveyed.

Post burn surveys of up to 100% of the low potential habitat within each BU will be conducted, and the data will be used to further validate the GIS habitat model.

The GIS habitat model will continue to be refined using newly acquired data. The model is considered dynamic and may be refined whenever potential contributing information is identified.

Data collected as part of each Pima pineapple cactus survey will include cactus measurements, number of pups present, percent vegetative cover, map of the area surveyed, hours surveyed, number of people surveying, number of Pima pineapple cacti located, and geographic coordinates for each individual cactus.

All known Pima pineapple cacti will be marked and protected from fire through the removal of fuels around each cactus, except those cacti that may be part of an experimental burn sample. Measures will be taken to insure that mortality of Pima pineapple cactus from fire will not exceed 5 percent. Vegetative cover surrounding each cactus will determine the level of clearing. A circle of vegetation within a 1-foot radius from each cactus will be saved in order to preserve a micro-habitat beneficial to these plants. A 10-foot radius will be cleared around the 1-foot radius circle. The clearing could be done by black-lining, mowing (weedwhacking) and raking, foaming or whatever measure is appropriate to make the doughnut shaped area unlikely to burn.

All known Pima pineapple cacti in each BU will be monitored after a prescribed burn. This will assist in the determination of the effectiveness of the protective measures. It will also assist in evaluating the effectiveness of the pre-burn surveys based upon the habitat model.

Any burned portion of any buffer areas will be surveyed for Pima pineapple cacti (post-burn) in the high and medium probability areas as depicted on the BANWR Pima Pineapple Cactus Predictive Model map. This will aid in determination of rates of mortality with respect to fire.

Masked Bobwhite

If nesting birds or relatively high densities of masked bobwhites are located within a BU, that portion of the unit will not be burned in 2011.

For masked bobwhite, it is assumed that any fire occurring in a buffer area would be from a single direction, allowing the birds to escape ahead of the fire. The acreage of the burns in buffer

areas, however, would count toward the acreage cap for the year which will reduce acreage burned elsewhere and provide usable, unburned habitat for the masked bobwhite.

In general, adjacent units will not be burned during the same year in order to preserve habitat for masked bobwhite to move into if the area they are using becomes undesirable due to lack of regeneration of habitat. The exceptions to this are the very small units which, for practical reasons, will be burned together or if the burn moves into a buffer area. With the exception of State and Compartidero1 Burn Units, all burning in 2011 will take place outside of the core masked bobwhite habitat areas specified in the HMP.

Gila Topminnow and Chiricahua Leopard Frog

The dirt tanks containing Gila topminnow and Chiricahua leopard frogs are typically surrounded by elevated berms which effectively protect the tanks from ash and sediment flow. However, the inlets are somewhat vulnerable harmful post-burn ash and sediment flows. State Tank is only tank containing leopard frogs that occurs within a scheduled 2011 Refuge burn unit boundary (See Figure 1). Surveys completed in August, 2010 document the presence of Chiricahua leopard frogs in State Tank although no Gila topminnows were detected (Pers.Com. Brent Sigafus, USGS, December, 2010). The absence of topminnows in State Tank is likely due to the fact that this tank went dry for a brief period in 2009. State Tank will be protected with straw wattles as conservation measure to reduce ash and sediment flows into the water. Installation of the straw wattles will take place after the burn and before on onset of the monsoons. Other important topminnow and leopard frog ponds including Rock, Choffo, Carpenter, and Garcia tanks are not in burn units, so no protection will be needed.

STATUS OF THE SPECIES AND ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

Description of the Action Area

The general description of the action area and the environmental baseline for the action area is described in the 2002 BO BANWR FMP (USFWS 2002), the 2004 BO BANWR FMP (USFWS 2004), and the 2005 BO BANWR FMP (USFWS 2005c); and is incorporated here by reference. The ecological communities and management activities on the BANWR have not changed substantially. The fire program has been more focused on ecological objectives, with a subsequent reduction in the acres burned. The proposed BUs for application of prescribed fire are summarized in Table 1 and illustrated in Figure 1.

Pima Pineapple Cactus

The final rule listing Pima pineapple cactus as endangered was published on September 23, 1993 (58 FR 49875). No critical habitat has been designated for this species. The Pima pineapple cactus occurs south of Tucson, in Pima and Santa Cruz counties, Arizona and adjacent northern Sonora, Mexico. The Pima pineapple cactus is distributed at very low densities throughout both

the Altar and Santa Cruz valleys, and in low-lying areas connecting the two valleys. Factors that contributed to the listing include habitat loss and degradation, habitat modification and fragmentation, limited geographic distribution and species rareness, illegal collection, and difficulties in protecting areas large enough to maintain functioning populations.

The current status of the species and biological information are documented in the Altar Valley Fire Management Plan BO (USFWS 2008a) and are included here by reference. Our records indicate that, range wide, 43 formal consultations have been completed for actions affecting Pima pineapple cactus.

A. Status of the species within the action area

The status of pineapple cactus through 2004 was described in the 2005 BO BANWR FMP (USFWS 2005c), in the 2004 BO BANWR FMP (USFWS 2004), and in the 2002 BO BANWR FMP (USFWS 2002). The BANWR implemented the prescribed burns from 2005 to 2008 as proposed in the 2005 BO (USFWS 2005c). Since 2004, complete surveys of high and medium quality habitat in BUs were completed prior to prescribed burning. A total of 320 new Pima pineapple cacti were found during 3,000+ person hours of pre-burn and post-burn surveys. Several of these new locations were used to refine the GIS-based habitat model which is being used to identify habitat on or adjacent to the Refuge. Post-burn monitoring of 193 individuals in the BUs, documented four pineapple cactus killed due to fire and 46 killed through non-fire related effects. The construction of the border barriers have resulted in the loss of 52 acres of potential habitat, and the placement of seven observation towers will result in the loss of another 4.8 acres of potential Pima pineapple cactus habitat within the action area. A total of 557 Pima pineapple cactus locations are known on the Refuge.

New data regarding the Pima pineapple cactus on BANWR was gathered in 2010. During the 2009-10 pre-burn PPC surveys, a total 114 new PPCs were discovered. Data records for each of these PPCs were included in the GIS database resulting in a combined total of 597 PPC records for the Refuge. Thirty-five new and previously discovered viable PPCs occurred within the FY2010 burn unit boundaries. All protective measures specified in the BO were applied to each of these cacti to protect them from potentially damaging fire effects. The 35 PPCs in the burn units were revisited within 5 weeks of the burns to evaluate impacts from fire.

Results of the post-burn surveys are as follows:

- 0 (0%) PPCs died from fire
- 0 (0%) PPCs were burned, had singed spines or showed any fire related heat stress
- All 35 (100%) viable cacti were protected from fire effects by removing fuel surrounding each plant.
- 7 (20%) PPCs showed signs of shriveling and desiccation due primarily to pre-monsoon drought conditions
- 3 (8%) had broken or crushed portion but remained healthy and viable. This was due to animal and/or human activity.

The 114 newly discovered PPCs were also used as additional validation points to assess the GIS PPC predictive model accuracy. Newly assessed model accuracies results are as follows:

- 428 points were used to validate the model
- 209 (48.8%) occurred within predicted high probability habitat
- 162 (37.9%) occurred within predicted moderate probability habitat
- 371 (86.7%) occurred within predicted suitable habitat (high and moderate probability areas combined)
- 57 (13.3%) occurred within predicted non-habitat.

Overall model accuracy for suitable habitat had dropped slightly from 88% to 86.7% as compared to accuracy the assessment completed in 2008. This is due primarily to the discovery of several new PPCs which occurred in close proximity but outside mapped predicted areas in

2009 and 2010. The GIS model will be updated and improved prior to the implementation of future PPC surveys.

B. Factors affecting species environment within the action area

Factors affecting pineapple cactus in the action area are documented in the 2005 BO BANWR FMP (USFWS 2005c), 2004 BO BANWR FMP (USFWS 2004), and the 2002 BO BANWR FMP (USFWS 2002); and are included here by reference. The only change has been the construction and operation of the international border protection infrastructure. This includes vehicle and pedestrian barriers along the south end of the Altar Valley and the installation and operation of electronic observation towers. These barriers have resulted in a relatively recent decrease in illegal immigration and drug smuggling activities moving north from the border through the BANWR. The actions of the U.S. Border Patrol have also decreased on the BANWR in response.

Masked Bobwhite

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 (USFWS 1995). Critical habitat is not designated for this species. A recovery plan for the masked bobwhite exists and has been revised several times (USFWS 1995).

Biological information on masked bobwhite is summarized in the 2004 BO BANWR FMP (USFWS 2004) and in the recovery plan for this species (USFWS 1995) and is incorporated here by reference. The known populations of masked bobwhite have shown a significant decline in recent years. Survey efforts in Mexico have not located any masked bobwhites in the last two years. In the United States, masked bobwhite had been found primarily on the BANWR and ranchlands immediately adjacent to the BANWR. Several observations in the north end of the Altar Valley have been made along SR 286. Detections during summer call-count surveys have declined in recent years.

The only formal Section 7 consultations on masked bobwhite are on the BANWR Fire Management Plans. This species has been included in several informal consultations related to the BANWR's Comprehensive Conservation Plan, Altar Valley Fire Management Plan, and various masked bobwhite related management actions.

A. Status of the Species within the Action Area

The reintroduced individuals on the BANWR made up the only known population of masked bobwhite in the United States. The BANWR discontinued its captive propagation and release program in 2005 and is proposing to resume this program in 2010, after the burn season. The population has been monitored continually using summer call counts. The population on the BANWR appeared to be increasing through 2005, but then crashed shortly after the captive release program was suspended. The construction of the border barriers have resulted in the loss of 52 acres of potential habitat, and the placement of seven observation towers will result in the loss of another 4.8 acres of potential masked bobwhite habitat within the action area. Two unconfirmed observations have occurred in Triangle and Secundino BUs in 2009. Nine additional anecdotal observations of masked bobwhite were made on BANWR in 2009. However, no masked bobwhites have been confirmed from 2007 – 2009 during formal survey efforts.

Twenty seven call-count surveys were completed from 1 July through 21 August of 2010. Refuge staff who implemented these surveys included both Refuge Biologists, and one Student Conservation Association Intern. Twenty-one survey routes were completed 1 or 2 times and covered the bulk of the presumed habitat. Effort was concentrated in areas traditionally known to have bobwhites. Normally, up to 8 iterations of surveys per call route take place within the Refuge during the bobwhite breeding season. However, this number of survey iterations was not possible this year due to a masked bobwhite quail captive breeding facility crisis which required full participation of the entire Refuge Biological staff during the breeding season.

Despite surveying every morning when conditions allowed, only one masked bobwhite was detected during the formal surveys. In addition, four reliable anecdotal detections took place within Refuge in 2009 and 2010. Descriptions of formal and anecdotal masked bobwhite detections are as follows:

- A single male MBQ seen by Law Enforcement Officer Scott Kozma and Ed Carr near Carpenter Tank on 11-Nov-09.
- Two or more masked bobwhites were seen with within a covey of ~ 8 Montezuma quail on 17-Nov-09 on the eastern edge of the Yellow Jacket Burn Unit by BANWR volunteers Dan and Laurie Mooney. These detections were confirmed by Refuge Biologists on 19-Nov-09.
- A single singing male MBQ was seen by SCA Intern Liz Payne during a formal survey near Huatcheta Springs/Rock Tank on 31-Jul-10.
- Law Enforcement Officer Jim Casey saw a single male MBQ fly over the hood of his vehicle on the Refuge Entrance road on 8-Aug-10.

It is important to note that captive bred/pen reared MBQ were released on two sites within BANWR during 2010. Twenty-eight bobwhites were released near Huatcheta Springs on 25-Jul-10 and 46 bobwhites were released in the Montana Unit on 14-Jul-10. The MBQ's that Liz Payne and Jim Casey saw were likely dispersing birds from the Huatcheta Springs release site.

Even though all of these formal and anecdotal detections are considered confirmed and valid, we concluded that the population of free roaming masked bobwhites on the Refuge has declined significantly since 2004 when the last broad-scale programmatic releases of pen-reared birds took place.

B. Factors affecting species environment within the action area

The factors affecting masked bobwhite on the BANWR were documented in the 2004 BO BANWR FMP (USFWS 2004) and the 2005 BO BANWR FMP (USFWS 2005c) and are incorporated here by reference. Drought and small population size seems to be the largest factors effecting masked bobwhite on the BANWR. Detections of individuals and coveys on the BANWR were increasing through 2005, and apparently the population crashed in response to the poor precipitation during the period of 2006-2007. The population has not rebounded, probably due to the existing population not being large enough to rebound. The only change in factors affecting the species environment has been a relatively recent decrease in illegal immigration and drug smuggling activities moving north from the border through the BANWR. The actions of the U.S. Border Patrol have also decreased on the BANWR in response.

Chiricahua Leopard Frog

The Chiricahua leopard frog was listed as a threatened species without critical habitat in 2002 (67 FR 40790). Included was a special rule to exempt operation and maintenance of livestock tanks on non-Federal lands from the section 9 take prohibitions of the Act. No critical habitat has been designated for the Chiricahua leopard frog, although a proposed rule to designate critical habitat is currently being developed. The Chiricahua leopard frog recovery plan was completed in 2007 (USFWS 2007).

Threats to this species include predation by nonindigenous organisms, especially bullfrogs, fish, and crayfish; disease; drought and climate change; floods; degradation and loss of habitat as a result of water diversions and groundwater pumping, poor livestock management, altered fire regimes due to fire suppression and livestock grazing, mining, development, and other human activities; disruption of metapopulation dynamics; increased chance of extirpation or extinction resulting from small numbers of populations and individuals; and environmental contamination. Numerous studies indicate that declines and extirpations of Chiricahua leopard frogs are at least in part caused by predation and possibly competition by nonindigenous organisms, including fish in the family Centrarchidae (*Micropterus* spp., *Lepomis* spp.), bullfrogs, tiger salamanders (*Ambystoma* spp.), crayfish (*Orconectes virilis* and possibly others), and several other species of fish (Clarkson and Rorabaugh 1989; Sredl and Howland 1994; Fernandez and Bagnara 1995; Rosen et al. 1995; Snyder et al. 1996; Fernandez and Rosen 1996a and b, 1998). For instance, in the Chiricahua region of southeastern Arizona, Rosen et al. (1995) found that almost all perennial waters investigated that lacked introduced predatory vertebrates supported Chiricahua leopard frogs. All waters except three that supported introduced vertebrate predators lacked Chiricahua leopard frogs. Sredl and Howland (1994) noted that Chiricahua leopard frogs were nearly always absent from sites supporting bullfrogs and nonindigenous predatory fish. Rosen et al. (1995) suggested further study was needed to evaluate the effects of mosquitofish, trout, and catfish on frog presence.

The status of Chiricahua leopard frog has changed little since our February 11, 2008, Intra-Service Biological and Conference Opinion on Issuance of an Enhancement of Survival Permit (TE-083686-0) to the Arizona Game and Fish Department (file number 22410-2003-F-0022). We incorporate by reference the Status of the Species section of that biological opinion (USFWS 2008b). Additional information about the Chiricahua leopard frog can be found in Platz and Mecham (1979, 1984), Sredl and Howland (1994), Rosen et al. (1995), Jennings (1995),

Degenhardt et al. (1996), Sredl et al. (1997), Painter (2000), Sredl and Jennings (2005), and USFWS (2007).

Our records indicate that, in Arizona, 97 formal consultations have been completed for actions affecting Chiricahua leopard frog.

A. Status of the species within the action area

In 2004, Chiricahua leopard frogs were known from Carpenter, Choffo, Rock, and State tanks. A large population site was also known on the Coronado National Forest that was probably part of the same metapopulation. Since this time the Chiricahua leopard frog status in the action area has gone through normal metapopulation fluctuations. Choffo Tank is no longer occupied and is not considered to be a perennial tank. Triangle Tank, near the main entrance road, has been renovated and is occupied by Chiricahua leopard frogs. Precipitation during the 2008 monsoon season provided additional opportunity for Chiricahua leopard frogs to expand into several additional locations on the BANWR. In fall of 2008, a total of eight sites were occupied including Aguire Lake, Bailey Gravel Pit 2, Carpenter Tank, Hito Tank, Rock Tank, State Tank, Sulfido Tank and Triangle Tank. Due to seasonal drying, only the four perennial Chiricahua leopard frog sites (Carpenter, Rock, State, and Triangle tanks) are reasonably certain to be occupied during the 2010 fire season. Refuge-wide surveys implemented by USGS staff in August, 2010 confirm the presence of leopard frogs within several of the stock tanks previously identified as habitat for these species. No new habitat areas have been identified within BANWR for leopard frogs. The construction of the border barriers and the placement of seven observation towers are not likely to affect Chiricahua leopard frogs directly, but the road and barrier along the international border may reduce cross border dispersal and gene flow.

B. Factors affecting species environment within the action area

The factors affecting Chiricahua leopard frogs in the action area have not changed substantially from those described in the 2005 FMP BO (USFWS 2005c) and are incorporated here by reference. Bullfrogs, from six source population sites on the west side of the valley, dispersing on to the BANWR are a perennial threat, but have recently been reduced significantly. Active monitoring and management of bullfrogs on the BANWR will need to continue to safe guard this metapopulation. The threats from illegal immigration and Border Patrol activities have probably diminished with the movement of these activities out of the valley bottom and into the mountains.

Gila Topminnow

Gila topminnow was listed as endangered in 1967 without critical habitat (32 FR 4001). Only Gila topminnow populations in the United States, not those in Mexico, are listed under the Act. No critical habitat has been designated for this species. The reasons for decline of this fish include past dewatering of rivers, springs and marshlands, impoundment, channelization, diversion, regulation of flow, land management practices that promote erosion and arroyo formation, and the introduction of predacious and competing nonindigenous fishes (Miller 1961, Minckley 1985). Other listed fish suffer from the same impacts (Moyle and Williams 1990). Life history information can be found in the 1984 recovery plan (USFWS 1984), the draft revised Gila topminnow recovery plan (Weedman 1999), and references cited in the plans.

The status of Gila topminnow has changed little since our February 11, 2008, Intra-Service Biological and Conference Opinion on Issuance of an Enhancement of Survival Permit (TE-083686-0) to the Arizona Game and Fish Department (file number 22410-2003-F-0022). We hereby incorporate by reference the Status of the Species section of that biological opinion (U.S. Fish and Wildlife Service 2008). For additional information about the Gila topminnow see Desert Fishes Team (2003), Minckley (1999), Hedrick et al. (2001), and Voeltz and Bettaso 2003.

Our records indicate that, range wide, 99 formal conferences or consultations have been completed for actions affecting Gila topminnow.

A. Status of the species within the action area

Refuge-wide surveys implemented by USGS staff in August, 2010 confirm the presence of topminnows within several of the stock tanks previously identified as critical habitat for this species. No new habitat areas have been identified for Gila topminnow. No other formal surveys or trapping efforts have occurred on the BANWR since 2004. Informal observations in Rock and State tanks have not resulted in any individuals being detected during the intervening period. The species is still presumed to be present due to the availability of the habitat and lack of predators and non-native competitors. The construction of the border barriers and the placement of seven observation towers are not likely to affect Gila topminnow.

B. Factors affecting species environment within the action area

The factors affecting Gila topminnow in the action area have not changed substantially from those described in the 2005 FMP BO (USFWS 2005c) and are incorporated here by reference. The threats from illegal immigration and Border Patrol activities have probably diminished with the movement of these activities out of the valley bottom and into the mountains.

EFFECTS OF THE ACTION

Effects of the action means the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration.

Pima Pineapple Cactus

The effects of the proposed action are similar to those described in the 2004 and 2005 BO BANWR FMP (USFWS 2004 and 2005c) and incorporated here by reference. One potential source of additional effects is the use of buffer areas around a BU. If fire escapes the proposed BU, it will potentially expose individual Pima pineapple cactus in the buffer area to direct flames. While escapes into buffer areas are not anticipated and, if they do occur, they are usually of only a few acres in size, fire escaping into the buffer areas could result in direct mortality or harm to individual cacti. The information gained from the post fire surveys in any portion of the buffer areas that burn will assist in understanding this species' fire ecology. The 8,999-acre cap on all burns and wildfire in the grassland units will reduce the potential for these effects occurring around each proposed BU burn, since once 8,999 acres of grassland are burned, no additional grassland prescribed burns shall be ignited for the 2011 fire season.

Masked bobwhite quail

The effects of the proposed action are similar to those described in the 2004 BO BANWR FMP (USFWS 2004) and the 2005 BO BANWR FMP (USFWS 2005c) and are incorporated here by reference. The reduction in the number of grassland acres burned per year, a maximum of 8,999 acres, will result in reducing the potential direct and indirect adverse effects on masked bobwhite from those described in the 2004 BO BANWR FMP (USFWS 2004) and 2005 BO BANWR FMP (USFWS 2005c). The lack of aerial ignition system use will also further reduce the complexity of fire advance and minimize the potential for trapping masked bobwhite within the burn.

Chiricahua leopard frog

The proposed action is not anticipated to have direct effects on Chiricahua leopard frogs. The season when BUs would be ignited is prior to the typical dispersal period during the monsoon season, July-September. In addition, the frogs are inactive during the period of the cool season burns and are not anticipated to be directly impacted by the burns.

Indirect effects of the prescribed fire are anticipated through increased sediment and ash flow into occupied waters from project related activities that occur upstream from occupied sites. Fire removes vegetation and consumes organic components of ground cover, thus changing the physical and chemical properties of watersheds and the streams, wetlands, and aquatic habitats to which they contribute. The removal of vegetation can trigger an increase in water yield and storm-flow discharge (Swanston 1991). Elevated peak flow volumes and velocities are associated with increased transport of ash and nutrients (Ffolliott et al. 2004). Heavy ash and soot content in water clogs tadpole and fish gills and leads to acute and chronic water quality effects. The runoff of ash contributes phosphoric nutrients to aquatic ecosystems, and the presence of charcoal in water is associated with reduced dissolved oxygen concentrations. Both ammonia and phosphorus levels have been documented to be above lethal limits to fish during fires (Spencer and Hauer 1991). Similar effects are anticipated for leopard frog tadpoles and eggs. In addition, inflow of ash and sediment into a water body is capable of smothering eggs and tadpoles, resulting in the loss of individuals and reproductive potential. Sediment and ash flow can also inhibit respiration in macroinvertebrates, resulting in reduced density and composition of macroinvertebrates (a primary food resource for the frogs). A reduction in the amount of prey can ultimately affect leopard frog numbers and reproduction. This could have an effect on population persistence and alter the metapopulation dynamics in this portion of the Altar Valley. The conservation measures that are included in this action will minimize these potential indirect effects. State Tank is the only occupied site within a BU proposed to be burned as part of this action. The effects of ash and sediment flows are temporary. The aquatic habitats should be habitable after the ash and sediment settles, and the aquatic community of invertebrates and plants become reestablished. Other occupied tanks, including Carpenter and Triangle tanks, along with Rock and Headquarters tanks, are outside of the impact area of this proposed action, and these unaffected tanks can act as sources of recolonization. The Chiricahua leopard frog has a very high reproductive potential and can repopulate a tank fairly quickly once the aquatic habitat becomes hospitable.

Gila Topminnow

Effects to Gila topminnow would be similar to those described above for Chiricahua leopard frog aquatic habitats. The primary difference is that Gila topminnows on the BANWR are not part of a functioning metapopulation, with a series of dispersal and colonization events that provide for local extirpation and recolonization of sites. Therefore, if a population is lost due to fire, reestablishment will have to occur through a direct management decision to place topminnow back into the tank. In addition, the adult Gila topminnows have no means of avoiding impacts of sediment and ash flows like adult and metamorph Chiricahua leopard frogs. Therefore, the conservation measures included in this action are important to reduce these effects, namely the use of straw wattles to stabilize and trap sediment above the inlet of State Tank.

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. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The discussion of cumulative effects in the 2005 FMP BO (USFWS 2005c) remains unchanged and is incorporated here by reference. The only change is a potential reduction in the occurrence of illegal immigration and law enforcement interdiction in the action area, as a result of the Border barriers at the south end of the action area.

CONCLUSION

Pima pineapple cactus

After reviewing the current status of the Pima pineapple cactus, the environmental baseline for the action area, the effects of the proposed extension of the BANWR FMP 2005-2008 into the 2011 fire season an additional year, and the cumulative effects, it is our biological opinion that the extension of the BANWR FMP 2005-2008 into the 2011 fire season, as proposed, is not likely to jeopardize the continued existence of the pineapple cactus. No critical habitat has been designated for this species; therefore, none will be affected. We present this conclusion for the following reasons:

- The reduction in the number of acres burned annually reduces overall effects of the action.
- The habitat model developed for the BANWR focuses survey efforts and minimization efforts.
- The conservation measures for Pima pineapple cactus have been effective in limiting effects to this species in past years.
- No long-term adverse affects are anticipated on the habitat for this species.

Masked bobwhite

After reviewing the current status of masked bobwhite, the environmental baseline for the action area, the effects of the proposed extension BANWR FMP 2005-2008 into the 2011 fire season an additional year, and the cumulative effects, it is our biological opinion that the extension of the

BANWR FMP 2005-2008 into the 2011 fire season, 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 declined to the point that masked bobwhite are not reasonably certain to occur in the action area.
- Any BUs which are determined to have nesting masked bobwhite or high densities of masked bobwhite will be removed from the proposed action.
- Masked bobwhite captive breeding stock will not be impacted by the proposed action.
- The reduction of proposed acreage to be burned has reduced the potential effects to the species.
- The current distribution of the burns within the action area provide adequate habitat on the BANWR for masked bobwhite likely to be released this year or if any are existing on the BANWR.
- The prescribed burns will be implemented to improve quail habitat, so the short-term negative effects will be offset by long-term positive effects.
- Aerial ignition will not be used and flame fronts will mimic natural fires, providing escape routes from the fire to patches of unburned areas within the BU.

Chiricahua leopard frog

After reviewing the current status of Chiricahua leopard frog, the environmental baseline for the action area, the effects of the proposed extension of the BANWR FMP 2005-2008 into the 2011 fire season and the cumulative effects, it is our biological opinion that the extension of the BANWR FMP 2005-2008 into the 2011 fire season, as proposed, is not likely to jeopardize the continued existence of the Chiricahua leopard frog. No critical habitat has been designated for this species; therefore, none will be affected. In making this determination, we considered the following:

- The only occupied site likely to be impacted by the proposed burns is State Tank, and conservation measures will be applied to reduce any potential impacts.
- The design of this tank and the conservation measures included as part of the action reduce the potential for anticipated impacts.
- Any impact from sediment and ash flow will be short-term.
- Chiricahua leopard frog reproductive potential will make up for any reduction in existing population size due to the action.

Gila topminnow

After reviewing the current status of Gila topminnow, the environmental baseline for the action area, the effects of the proposed extension of the BANWR FMP 2005-2008 into the 2011 fire season and the cumulative effects, it is our biological opinion that the extension of the BANWR FMP 2005-2008 into the 2011 fire season, as proposed, is not likely to jeopardize the continued existence of the Gila topminnow. No critical habitat has been designated for this species; therefore, none will be affected. In making this determination, we considered the following:

- No Gila topminnow were documented in State Tank in August of 2010. This site was previously occupied by topminnow and is the only site that could potentially be affected by the proposed action. Lack of topminnow at this site in 2010 reduces the likelihood of any impacts from the proposed action.
- The design of State tank and the conservation measures included as part of the action minimize the potential for anticipated effects.
- A sediment and ash flow is unlikely to affect the entire aquatic sites based upon the design and size of the water tanks.
- Any impact from sediment and ash flow will be short-term.
- The reproductive potential of any remaining Gila topminnow will make up for any reduction in existing population size.

The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations 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 further 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.

Pima pineapple cactus

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.

AMOUNT OR EXTENT OF TAKE

Masked bobwhite

The FWS does not anticipate the proposed action will incidentally take any masked bobwhite quail for the following reasons:

- The presence of masked bobwhite has only been confirmed once through formal surveys on the BANWR in the past three years. Anecdotal sightings occurred in 2009 and 2010, but are not within any of the BUs proposed for 2011.
- Masked bobwhite are not reasonably certain to be in the BU proposed for prescribed burns or the buffer zones.
- If masked bobwhite are detected in any of the BUs proposed for 2011, that unit will not be burned in 2011.
- The prescribed burn program may result in short-term adverse effects, but is implemented to improve masked bobwhite habitat. Therefore, this action is anticipated to provide a long-term benefit to masked bobwhite through habitat maintenance and improvements.

Chiricahua leopard frog

FWS anticipates incidental take of Chiricahua leopard frog could occur in the form of harm, harass, or indirect mortality resulting from the increased flow of sediment, debris, and ash into State Tank. Individuals will be harmed through changes in the water chemistry; heavy sediment and ash deposits covering eggs, tadpoles, and clogging gills; and the temporary habitat loss through increased run off after the prescribed burn. Harm would also occur through the loss of habitat resulting in the movement within the stock tanks from altered habitats and increased intra-species competition for food and territory.

The FWS anticipates incidental take of Chiricahua leopard frogs will be difficult to detect for the following reasons: early life stages of this species have a small body size, losses may be masked by seasonal fluctuations in numbers or other causes (e.g., oxygen depletions for aquatic species, disease), dead tadpoles and frogs are easily scavenged, and the species occurs in habitat that makes detection difficult; therefore finding a dead or impaired specimen is unlikely. Therefore, incidental take will be quantified based upon habitat disturbance and surrogate species.

The level of incidental take of this species can be anticipated to be no more than 50 percent of the bottom of State Tank being covered by fresh silt or ash deposits following a post-fire, precipitation event. Such deposits are directly related to habitat modifications and, if exceeded, will constitute an unacceptable impact to occupied habitat and individual Chiricahua leopard frogs. Incidental take will also be exceeded if more than 10 dead or dying Chiricahua leopard frogs or 20 fish, tadpoles, or other aquatic vertebrates of any species are observed near or within State Tank during or within three days of a post-fire, runoff event. The observation of this level of mortality in aquatic vertebrates represents a much larger potential die off of Chiricahua leopard frogs due to a significant change in water and habitat quality.

Gila topminnow

FWS anticipate incidental take of Gila topminnow could occur in the form of harm, harass, or indirect mortality resulting from the increased flow of sediment and ash into State Tank. Individuals will be harmed through changes in the water chemistry; heavy sediment and ash deposits covering eggs, fry, and clogging gills; and the temporary habitat loss through increased run off after the prescribed burn. Harm would also occur through the loss of habitat resulting in the movement within the stock tanks from altered habitats and increased intra-species competition for food and territory.

The FWS anticipates incidental take of Gila topminnow will be difficult to detect for the following reasons: this species has a small body size, losses may be masked by seasonal fluctuations in numbers or other causes (e.g., oxygen depletions for aquatic species), dead topminnows are easily scavenged, and the species occurs in habitat that makes detection difficult; therefore finding a dead or impaired specimen is unlikely. Therefore, incidental take will be quantified based upon habitat disturbance and surrogate species.

The level of incidental take of this species can be anticipated to be no more than 25 percent of the bottom of State Tank being covered by fresh silt or ash deposits following a post-fire, precipitation event. Such deposits are directly related to habitat modifications and, if exceeded, will constitute an unacceptable impact to occupied habitat and individual Gila topminnow. Incidental take will also be exceeded if more than 20 dead or dying fish or other aquatic vertebrates of any species are observed near or within State Tank during or within three days of a post-fire, runoff event. The observation of this level of mortality in aquatic vertebrates represents a much larger potential die off of Gila topminnow due to a significant change in water and habitat quality.

EFFECT OF THE TAKE

In this biological opinion, the FWS determines that this level of anticipated take is not likely to result in jeopardy to the species for the reasons stated in the Conclusions section.

REASONABLE AND PRUDENT MEASURES and TERMS AND CONDITIONS

Chiricahua Leopard Frogs and Gila Topminnow

The following reasonable and prudent measure(s) are necessary and appropriate to minimize take of Chiricahua leopard frogs and Gila topminnow:

1. The BANWR shall monitor incidental take resulting from the proposed action and report to the FWS the findings of that monitoring by February 15, 2012.
2. The BANWR shall take measures to reduce sedimentation into State Tank, prior to the beginning of the 2011 fire season.

TERMS AND CONDITIONS

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

Chiricahua Leopard Frog and Gila Topminnow

- 1.1 BANWR shall monitor the project area and other areas that could be affected by the proposed action to ascertain take of individuals of the species and/or loss of their habitat that causes harm or harassment to the species. This monitoring will be accomplished by mapping or through photo monitoring the extent of any debris flows into occupied aquatic sites.

- 1.2 The BANWR shall submit a monitoring report to the Arizona Ecological Services Office by February 15, 2012. This report shall briefly document for the previous calendar year the effectiveness of the terms and conditions and locations of listed species observed, and, if any are found dead, suspected cause of mortality. The report shall also summarize tasks accomplished under the proposed conservation measures and terms and conditions. The report shall make recommendations for modifying or refining these terms and conditions to enhance listed species protection or reduce the unnecessary commitment of resources by the BANWR.
- 2.1 BANWR shall inspect the sediment traps at the entrances of State Tank to ensure they are properly maintained and emptied of sediment build up.
- 2.2 BANWR shall remove any excessive sediment build up in the sediment traps at the entrance of State Tank prior to the fire season.

Review requirement: The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. BANWR must immediately provide an explanation of the causes of the taking and review with the AESO 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 the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 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 office. 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 state.

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. Document all survey efforts and data on Pima pineapple cactus and masked bobwhite in the annual report under the Terms and Conditions for the Chiricahua leopard frog and Gila topminnow take statement.
2. Evaluate the existing BANWR 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.

3. 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.
4. Support or encourage research into fire effects on habitat regeneration and invertebrate food availability for masked bobwhite.
5. Continue active bullfrog control within the BANWR to promote the conservation of Chiricahua leopard frogs and other native aquatic species.

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

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in your reinitiation request. 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 retained (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.

The FWS appreciates the BANWR efforts to identify and minimize effects to listed species from this project. For further information please contact Scott Richardson at (520) 670-6150 (x242). Please refer to the consultation number, 22410-2005-F-0243-R003 in future correspondence concerning this project.

/ s / Laila Lienesch for
Steven L. Spangle

cc (hard copy):

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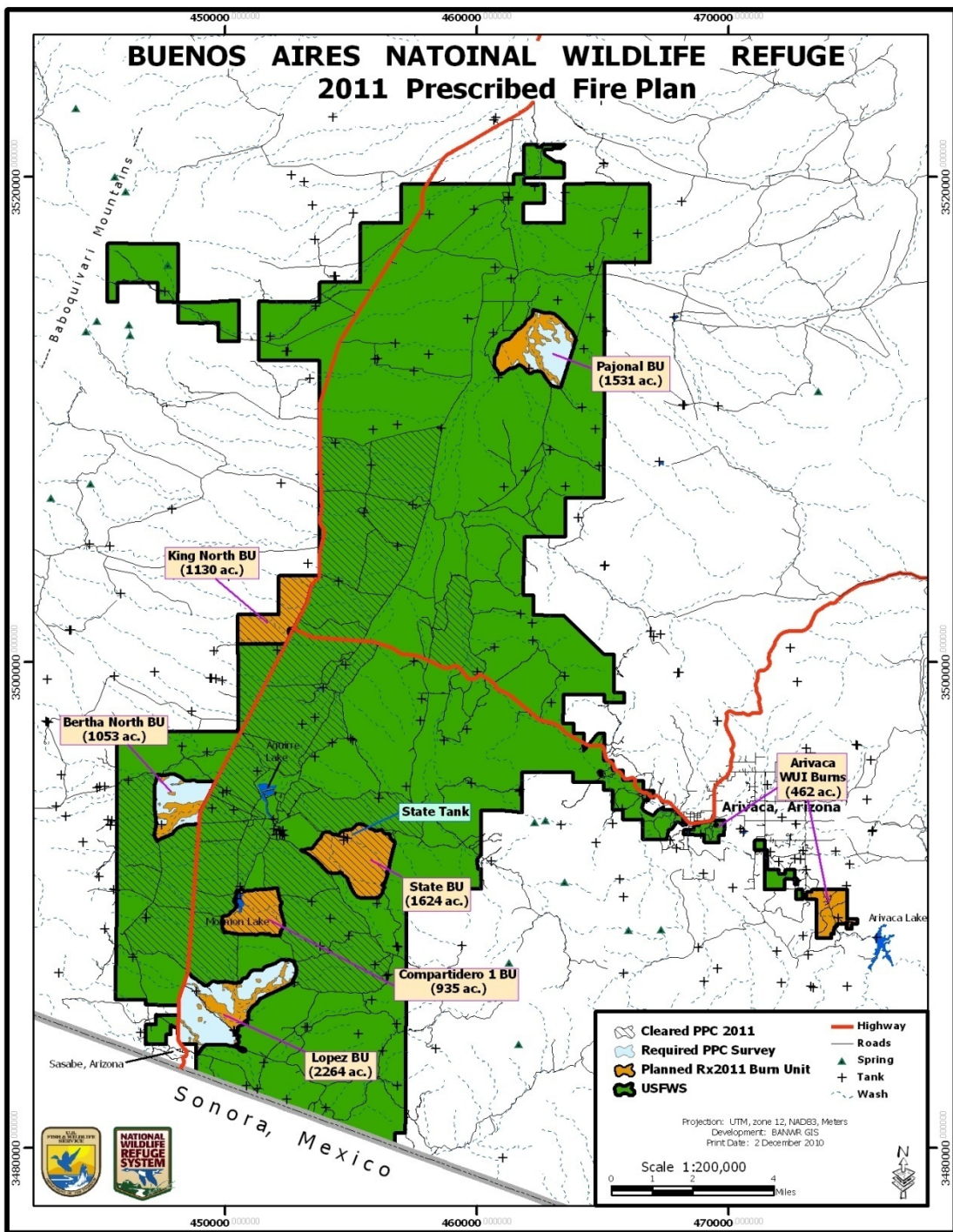
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TABLES AND FIGURES

Table 1. Burn units to be treated with prescribed fire in 2011

Burn Unit	Acreage	Approximate Ignition Date
Pajonal	1531	June 19 - 30, 2011
State	1624	June 19 - 30, 2011
Compartidero 1	935	June 19 - 30, 2011
Lopez	2264	June 19 - 30, 2011
Bertha North	1053	June 19 - 30, 2011
King North	1130	June 19 - 30, 2011
Arivaca Wildlands Urban Interface	462	February 1 - 28, 2011

Figure 1. Map of Action Area



APPENDIX A.

Lesser Long-nosed Bat (*Leptonycteris curasoae yerbabuena*)

Environmental Baseline

This species is known from grasslands, arid scrublands, and oak woodlands below 5500 ft in elevation. In Arizona, they arrive in mid- April, roosting in caves, abandoned mine shafts and tunnels. Young are typically born in maternity colonies in mid-May. Females and young remain in maternity roosts and forage on primarily saguaros below about 3500 ft until approximately mid-July. At this time the range expands and bats are found up to about 5500 ft in areas of semi-desert grassland and lower oak woodland, foraging primarily on agaves. These bats typically leave southern Arizona by late September to early October. While there are small caves and some mine shafts on or near the BANWR, no roost sites or maternity colonies are known to be on the BANWR.

Lesser long-nosed bats are known to forage on the BANWR, using species of agave and columnar cacti, as well as hummingbird feeders. *Agave parryi* on the BANWR typically occurs in relatively small numbers in the foothills portion of the BANWR. These areas are not part of a BU. When this agave is found within a BU, it is typically in gravelly soils which are sparsely vegetated and have little ability to carry a fire. Saguaro cacti, which are not numerous within the BUs, will be protected from prescribed fire as described above for Pima pineapple cacti.

Conclusion

The Service concurs with the BANWR determination that the action may affect, but is not likely to adversely affect lesser long-nosed bat, based upon the following:

- There are no known roost sites within the BUs.
- The majority of the foraging resources for this species are outside the BUs.
- Saguaro cactus within the BUs will be protected from prescribed fire.

Northern Mexican Gartersnake (*Thamnophis eques megalops*)

Environmental Baseline

The Northern Mexican gartersnake became a candidate species on November 25, 2008 and its consideration as a species of concern is relatively new on the refuge. Preferred habitats for this species includes dense vegetation along the banks, shallows of wetlands (ciénegas and stock tanks), pool or backwater habitats within streams and riparian woodlands (U.S. Fish and Wildlife Service, 2008). Population levels for this species have dropped significantly throughout its historic range including southern Arizona. Although currently very rare, these gartersnakes have occurred in relative abundance on the Arivaca Ciénega and Arivaca Creek in the past. The latest confirmed detection within the Refuge was a single snake seen on Arivaca Ciénega in 1992 while larger numbers of detections occurred within Arivaca Creek riparian woodlands in the 1970's (Pers.com. Cecil Schwalbe, USGS, October, 2010).

As indicated above, prescribed fire will likely be applied on up to 462 acres in the vicinity of Arivaca, Arizona and are classified as wildland urban interface (WUI) burns. Most of the acreage covered with these burns will take place within Refuge boundaries but in some cases may extend onto adjacent private lands. Approximately 200 acres of these prescribed fire treatments will take place in the sacaton dominated bottomlands and sedge/spike-rush marshes of Arivaca Cienega.

Prescribed burning in the Cienega is set for late winter to ensure a cool season burn and to minimize potentially harmful burn effects on sensitive marsh vegetation. Soil moisture conditions should be appropriate during that time period to ensure minimal impacts on marsh plant roots systems or to burrowing animals. Negative impacts to Northern Mexican Gartersnakes are not likely to take place since the timing of the burn corresponds to the dormant season (i.e., hibernation) for this species and the reduction of ground cover will be short term (pers.com. Jeff Servoss, USFWS, October, 2010). Additionally, Northern Mexican Gartersnakes, if present, have probably adapted to naturally occurring wildfire events since fire is thought to be part of the natural cycle in cienega ecosystems (pers.com. Jeff Servoss, USFWS, October, 2010).

Conclusion

The Service concurs with the BANWR determination that the action may affect, but is not likely to adversely affect the Northern Mexican Gartersnake, based upon the following:

- Northern Mexcian Gartersnakes have not been documented in the BU since 1992.
- Prescribed burns will occur within the dormant season for Northern Mexican Gartersnakes.
- Northern Mexican Gartersnakes have likely adapted to periodic fires, which occur naturally in cienega systems.