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AESO/SE  
02-21-02-M-0195

June 2, 2003

Memorandum

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

From: Field Supervisor

Subject: Buenos Aires National Wildlife Refuge City Hall Fire Emergency Consultation

Thank you for your May 24, 2002, request for emergency consultation with the U.S. Fish and Wildlife Service (Arizona Ecological Services Field Office (AESO) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). At issue are impacts resulting from the decisions and activities related to suppression of the City Hall Fire on the Buenos Aires National Wildlife Refuge (Refuge) located in Pima County, Arizona, on Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*) (pineapple cactus). In your memorandum, you requested our concurrence that the proposed action may affect, but is not likely to adversely affect, cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) (pygmy-owl), and masked bobwhite quail (*Colinus virginianus ridgwayi*) (masked bobwhite). Our concurrences are provided in Appendix A.

This biological opinion is based on information provided in the January 23, 2003, biological evaluation (BE) and documents from the Refuge Fire Management Plan biological opinion (USFWS 2002, file # 2-21-02-F-068). Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern and effects of fire on semi-arid grassland habitats. A complete administrative record of this consultation is on file at the AESO.

**Consultation History**

-May 24, 2002: Refuge phone call to AESO initiating emergency consultation.  
-January 13, 2003: Biological evaluation was sent to our office.  
-January 17, 2003: Biological evaluation was received.



## **BIOLOGICAL OPINION**

### **DESCRIPTION OF THE ACTION**

The Refuge is located in the southeastern quadrant of the State of Arizona, bordered on the south by Mexico. It is within the Altar Valley of south-central Pima County. The north boundary of the Refuge is about 45 miles southwest of Tucson, Arizona, and the headquarters is about 60 miles from Tucson. It consists of three management units that encompass diverse plant, wildlife, and wildlife recreational values. The main portion of the Refuge is the Sonoran Savanna Grasslands Management Unit that encompasses over 100,000 acres of Sonoran savanna grasslands. The Brown Canyon Unit is located on the west side of the refuge on the eastern face of the Baboquivari Mountains. This unit includes the transition from Sonoran savanna grassland to Madrean evergreen woodland at higher elevations. This unit is centered on an intermittent stream that runs in Brown Canyon and supports a diverse riparian area. The final unit is the Arivaca Unit, which is comprised of Arivaca Creek and Arivaca Cienega. This unit contains the only naturally occurring permanent water and, thus, the only aquatic communities on the Refuge.

### **Actions**

The action consisted of wildfire suppression in City Hall Fire Management Unit (FMU) in the Sonoran Savanna Grassland Management Unit of the Buenos Aires NWR. The fire was observed on May 14, 2002 and reported by a Trico Electric Company Employee at 12:30 PM. Initial attack occurred at 1:00 PM and included a Type 3 engine, Type 6 engine, and a water tender. The fire had covered approximately 200 acres. The FMU was scheduled for prescribed fire in 2002. Black-lining activities around the unit had been completed in anticipation of the prescribed fire season. A decision to allow the fire to burn within the City Hall FMU was made and burn out operations started immediately. Several sensitive areas were ignited to avoid the direct fire front. These included a saguaro cactus, City Hall well, and 4 power poles. Each received a 10-foot black-lined ring which protected it from the flame front. None of these sensitive areas were damaged due to the protective black lines ignited around them. Resources from Tucson, Three Points, and Arivaca wildfire units were requested and assisted with the burn out. Ignition was completed between 4:00 and 6:00 PM. The fire was monitored and hot spots along the perimeter were fought to avoid potential escape.

The wildfire did not completely burn the City Hall FMU. The mosaic pattern left fuels which could start and spread another wildfire. Some of the inner washes that started and ended on the road were lit. These washes had heavy fuels and could have created major spot fires in other areas. The fire was declared controlled on May 15 at 11:00 AM. It was declared to be out on May 20. An area of approximately 5,312 acres was burned.

### **CONSERVATION MEASURES**

The suppression activities in this consultation consist of a decision to let the unit burn. The perimeter had already been black-lined in preparation of scheduled prescribed burning later in the year. Surveys for pineapple cactus were started in preparation for a prescribed fire scheduled

later in the season. These surveys were not completed at the time of the action. The wildfire suppression decisions and actions were based upon an evaluation of safety and containment issues. Conservation measures consisted of partial pre- and post-fire surveys for pineapple cactus.

## **STATUS OF THE SPECIES**

### **Pima pineapple cactus**

#### Life History

The final rule listing Pima pineapple cactus as endangered was published September 23, 1993 (58 FR 49875). The rule became effective on October 25, 1993; critical habitat was not designated at that time. Factors that contributed to the listing include habitat loss and degradation, habitat modification and fragmentation, limited geographic distribution and plant species rareness, and illegal collection and difficulties in protecting areas large enough to maintain functioning populations. The biological information below is summarized from the proposed and final rules, and other sources.

Pineapple cactus is a low-growing hemispherical cactus with adults varying in stem diameter from 2.0 to 8.3 inches and height from 1.8 to 18.0 inches. Pima pineapple cactus occurs south of Tucson, in Pima and Santa Cruz counties, Arizona and adjacent northern Sonora, Mexico. It is distributed at very low densities throughout both the Altar and Santa Cruz valleys, and in low-lying areas connecting the two valleys.

Habitat fragmentation and isolation may be an important factor limiting future seed set of this cactus. Recent data show that the species cannot successfully self pollinate in situ and is reliant on invertebrate pollinators. One hypothesis is that the spatial distribution pattern of individual pineapple cactus within a given area may regulate pollinator visitations, thus resulting in more successful cross-pollination and subsequent seed set over the population (Roller 1996). If the pollinators are small insects, with limited ability to fly over large distances, habitat fragmentation may contribute to a decrease in pollinator effectiveness with a subsequent decrease in seed set and recruitment.

#### Population Stability

Extrapolations from surveys, 1992-1997, of known pineapple cactus locations suggest that the cactus may be more numerous than previously thought. Projections based only on known individuals may underestimate the total number of individuals. This in no way indicates that the cactus is not rare or endangered. Pineapple cactus is widely dispersed in very small clusters across land areas well suited for residential, commercial or mining development. As well, field observations suggest a great deal of land area within the range boundaries would not support pineapple cactus today due to historical human impacts. Thus, populations are already

considerably isolated from each other in many portions of the range, and population size and apparent recruitment varies significantly across the range. On a more local scale, population variability may relate to habitat development, modification, and/or other environmental factors such as slope, vegetation, pollinators, dispersal mechanisms, etc.

The transition zone between the two regions of vegetation described by Brown (1982) as semidesert grassland and Sonoran desert-scrub contains denser populations, better recruitment, and individuals exhibiting greater plant vigor. Vegetation within this transition zone is dominated by mid-sized mesquite trees, half shrubs (snakeweed (*Gutierrezia lucida*), burroweed (*Aplopappus tenuisectus*), and desert zinnia (*Zinnia* spp.) with patches of native grass and scattered succulents. Because populations are healthier in this transition zone, conservation within these areas is very important (Roller and Halvorson 1997). However, this important habitat type is not uniformly distributed throughout the plant's range. Populations of pineapple cacti are patchy, widely dispersed and highly variable in density.

### Status and Distribution

Generally, pineapple cacti grow on gentle slopes of less than 10 percent and along the tops (upland areas) of alluvial bajadas nearest to the basins coming down from steep rocky slopes. The plant is found at elevations between 2,362 ft and 4,593 ft (Phillips et al. 1981, Benson 1982, Ecosphere 1992), in vegetation characterized as either or as combination of both the Arizona upland of the Sonoran desertscrub and semidesert grasslands (Brown 1982).

Widely scattered surveys have been conducted across sites that varied considerably in cacti density. Densities ranged between 0.05-3 plants per acre. Pineapple cacti occur in 50 townships within its U.S. range. However, a considerable amount of land area within the range boundaries does not provide habitat for the species due to elevation, topography, hydrology, plant community type, and human degradation. To date, an estimated 56,730 acres (10 to 20 percent of the U.S. range) has been surveyed. Not all of this area has been intensively surveyed; some has only been partially surveyed using small land blocks to estimate densities rather than 100 percent ground surveys. A conservative estimate of total cacti located to date would be 3,800 individuals. This accounts for all locations ever found and not the current population size.

At least 2,203 (58 percent) of the known locations have been removed throughout the range. This quantity includes observed and authorized mortalities and individuals transplanted since the species was listed in 1993 to present. A small portion of these mortalities was caused by natural factors (eg., drought). Moreover, this figure does not take into account those cacti that are removed from private land or other projects that have no Federal nexus.

The area of habitat analyzed through section 7 for modification or destruction between 1987 and 2000 (i.e., habitat developed or significantly modified beyond the point where restoration would be a likely alternative) was approximately 24,429 acres, which represents 43 percent of the total area surveyed to date. The number of acres lost through private actions, not subject to Federal jurisdiction, is not known but given the rate of urban development in Pima County, is expected

to be significant.

The protection of habitat and individuals is complicated by the varying land ownership within the range of this species. An estimated 10 percent of the potential habitat for pineapple cactus is held in Federal ownership. The remaining 90 percent is on Tribal, State, and private lands.

Under section 9 of the Act, the taking of listed animals is specifically prohibited, regardless of landownership status. For listed plants, these prohibitions and the protection they afford generally do not apply. Arizona Native Plant Law may delay vegetation clearing on private property for the salvage of specific plants species within a 30-day period. Although the Arizona State Native Plant Law does prohibit the illegal taking of this species on state and private lands without a permit for educational or research purposes, it does not provide for protection of plants in situ through restrictions on development activities.

Based on current knowledge, the following threats documented with this reduction in habitat alter the landscape in a manner that would be nearly irreversible in terms of supporting pineapple cactus populations: urbanization, farm and crop development, and exotic species invasion. Prescribed fire can have a negative effect if not planned properly. Overgrazing by livestock, illegal plant collection, and fire-related interactions involving exotic Lehmann lovegrass (*Eragrostis lehmanniana*) may also negatively affect pineapple cactus populations (58 FR 49875).

Vegetation associated with higher pineapple cactus densities, reproduction, and greater levels of cactus vigor is described as a mid-sized mesquite shrub land with an assortment of other succulent species and native bunch grasses. Many of the species dominant in this vegetation type are associated with grazing (i.e., “increasers” under some grazing practices). Less intensively grazed pastures did support greater native grass coverage with more species present. However, even with increased bunch grass abundance, the fuel structure of the community was not continuous and allowed for substantial open patches along the drip line of shrub species where the cactus often occurs (Roller and Halvorson 1997). Also, specific levels of soil movement are required for seed germination because the seed will not germinate on the surface; it generally germinates at a depth of 0.2 - 0.6 inches (Roller 1996). Few locations throughout the plant’s range have documented the presence of seedlings or sub-adults. However, all but one of the known locations had been grazed within three years of the observation. Whether light to moderate grazing practices provide the appropriate level of soil movement to cause seed germination has not been determined. Over-land sheet flow across these areas may also move soil and deposit it over sediments. The study established on the Coronado National Forest should provide some insight on seed germination relative to specific grazing intensities.

Reduced herbaceous biomass within the immediate proximity of individuals may reduce heat intensity with fire. Reduced herbaceous cover and continuity decrease fire frequencies in semidesert grasslands, and over the long-term increase cactus survival following fire (McPherson 1995, Thomas and Goodson 1992, Wright and Bailey 1982).

The invasion of Lehmann lovegrass combined with fire is a threat to pineapple cactus populations. Continuous distributions of fuels and greater biomass near the apex of individual plants are believed to increase mortality following fire (Roller and Halvorson 1997). Fire increases Lehmann lovegrass distribution; correspondingly, fire intensity and fire frequency increases with Lehmann lovegrass invasion (McPherson 1995), a positive-feedback cycle.

Even with complete data on historical change related to pineapple cactus distribution and abundance, we cannot reliably predict population status due to compounding factors such as climate change, urbanization, legal, and political complexities (McPherson 1995). We do not know if the majority of populations of pineapple cactus can be sustainable under current reduced and fragmented conditions. Thus, the need for information on what limits the plant's distribution under current habitat conditions is significant.

Based on monitoring results, the range-wide status of the pineapple cactus appears to have been affected by threats that completely alter or considerably modify more than a third of the species' surveyed habitat, and have caused the elimination of nearly 60 percent of documented locations. These values are supplied to serve as an extrapolation of the situation that might be taking place across the rest of the entire population. Current information regarding the status of this species must be supplemented by more precise and thorough spatial analysis through the use of geographical information systems, databases, and on-the-ground surveys.

Dispersed, patchy clusters of individuals are becoming increasingly isolated as urban development, mining, and other commercial activities continue to detrimentally impact the habitat. The remaining habitat also is subject to degradation or modification from current land management practices, increased recreational use when adjacent to urban expansion (i.e., off-road vehicle use and illegal collection), and the continuing aggressive spread of nonnative grasses into its habitat. Habitat fragmentation and degradation will likely continue into the foreseeable future based on historical data and growth projections produced by the Pima County Association of Governments (1995). There is very little Federal oversight on conservation measures that would protect or recover the majority of the potential habitat. Even some areas legally protected under the Act have been modified and may not be able to support viable populations of the pineapple cactus over the long-term.

## **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.

Areas of the Altar Valley, which are now part of the Refuge, are considered to have once been representative of the Sonoran Savanna Grassland, a biotic community that now only exists as

small, relict stands in Mexico. The Sonoran Savanna Grassland was a subtropical, fire-climax grassland that occurred in valleys with level plains and gentle rolling hills on deep, fine textured soils. The principle grass species were summer-active root perennials such as Rothrock grama (*Bouteloua rothrockii*) and various species of three-awns (*Artistida* sp.). Other dominant plant species, which were present, were also of subtropical origins. Herbaceous shrubs and forbs were important components of this grassland community. Species characteristic of warm temperate origins such as curly mesquite (*Hilaria belangeri*) and side-oats grama (*B. curtipendula*) were likely restricted to sites along drainages and north-facing slopes. Most of the scrub species characteristic of semidesert grasslands such as burroweed and snakeweed were not typical components of the Sonoran Savanna Grassland Community, but probably occurred in the general vicinity. Trees and large shrubs were present within this community, but varied in density. Mesquites were present at one or two per acre in the southern portion of the valley and increased in frequency further north and were typically mature trees, 4 to 12 inches in diameter (Sayre 1999, Sayre 2000). Larger cacti, such as saguaros, were present, but not prevalent (Brown 1982).

The land managed by the Refuge is now largely considered semi-desert grassland or desert scrub. Mesquite and other woody species have invaded the upland habitats throughout the valley. This is due a combination of long-term climate changes, the introduction of cattle and horses, and the resulting soil erosion brought on by historical poor grazing management. Impacts from human agricultural uses combined with periods of severe drought and the lowering of the water table from the deepening of the arroyos in the valley have resulted in a habitat conversion favoring trees, woody shrubs and exotic grasses introduced in an attempt to halt the watershed degradation.

During the period from 1986 to 2000 approximately 43,560 acres burned in 116 reported wildfires. The acres burned ranged from 1 to 14,451 acres annually, with an average of 2,904 acres (USWFS 2001). The Refuge has used prescribed fire to manage the grassland habitat on the Refuge since 1988. In 1988, areas were burned in response to professional judgment for quail releases. During 1990-92, winter prescribed burns were used to open up bottomland vegetation with little success in improving the grassland habitat (USWFS 2001). In 1992, an evaluation of fire effects was made and spring burns were determined to show the best results for control of weedy species. In the period from 1988 to 2001, prescribed fire was used to burn 102,389.6 acres in 50 units (USWFS 2001).

In the period of 1999-2001, State Route (SR) 286 at approximately milepost 23 was realigned to straighten a section of road and replace a bridge. As part of this action, the existing right-of-way was exchanged for the new alignment on a portion of the Refuge. The old road was removed and the roadbed in the old alignment was ripped and seeded to restore the habitat. In addition, improvements to the Antelope Loop road (4.6.B) were started with the pull-off, all weather wash crossings, and the widening of the northern section of the road. Improvements to the Antelope Tour Loop were being completed. Based upon the information in the CCP Biological Evaluation, the 12-mile tour road will be widened by 6 feet on either side of the existing road.

This widening resulted in the loss of a minimum of 8.7 acres of grassland habitat for masked bobwhite quail and Pima pineapple cactus.

#### **A. Status of the species within the action area**

The Refuge is the largest contiguous piece of federally owned land that is known to contain pineapple cactus. In the 1991 request to initiate consultation on the Refuge fire program, the Refuge documented less than 20 individuals in two areas of the Refuge. In the 1992 Prescribed Burning Program Biological Assessment (USFWS 1992) the Refuge stated that burn units would be searched for these cacti, and weed trimmers would be used to create fire lines around each cactus.

In the 1994 BO for the Refuge Prescribed Grassland Burning, approximately 64 pineapple cacti were known to occur on the Refuge (USFWS 1994). It was noted that surveys of the three burn units proposed for 1994 were not complete, and only three cacti were so far known in these units. It was expected that undiscovered cacti were present in these burn units and could possibly be killed from direct damage by fire. Conservation recommendations for the cactus were to 1) protect known individuals, 2) survey areas to be burned and concentrate surveys in higher quality habitat, 3) survey areas post burn to determine detectability and refine the identification of potential habitat, 4) track individual cacti, 5) develop a 5-year fire plan with monitoring to determine the effect of the fire program on the spread of Lehmann lovegrass versus native grass, and 6) conduct intensive surveys in areas of ground disturbance.

In 1995, the 5-year fire plan recommended in 1994 was presented to AESO (USFWS 1995). It referred to 68 known pineapple cacti on the Refuge. A major portion of this plan involved monitoring to determine the effectiveness of the fire management program on restoring habitat for masked bobwhite quail. In addition, the monitoring program would determine the effect the fire program had on the spread of Lehmann lovegrass. This is of particular importance as the ability of pineapple cactus to withstand fire in native grass may be different from its ability to withstand fire in monotypic stands of Lehmann lovegrass. Lehmann lovegrass stands support higher fuel loads, more intense heat and can burn more often than native grasslands, with the potential result of higher mortality of pineapple cactus located in Lehmann lovegrass stands. To date, no results have been received from the monitoring that was in the conservation recommendation in the 1994 BO and included as part of the fire management plan consulted on in 1995. The current Fire Management Plan, approved in September 2001, includes the same plan to monitor and evaluate the fire management program's ability to meet objectives and determine effects it has on the native versus exotic vegetation.

In the 2002 Intra-Service Section 7 Consultation BE (USFWS), the Refuge estimated that approximately 60 percent of its acreage, about 70,309 acres, is potential pineapple cactus habitat. This acreage is all included within the fire management units. Based upon information in the Arizona's Heritage Data Management System (HDMS), there were 65 known cacti sites on the Refuge in 2001. The completion of surveys during 2002 resulted in 16 new sites being

located (Dan Cohen, pers. comm.); none were located in City Hall FMU. However, surveys within the City Hall FMU only covered 20% of the FMU prior to the fire and an additional 5% after the fire. The model being developed by the Refuge to assist in evaluating potential habitat on the Refuge for pineapple cactus rated this FMU as an area with a high probability of cactus occurrence. While no pineapple cactus are known from this FMU, it has not been completely surveyed. It is likely that many of the pineapple cacti which may have been growing in the City Hall FMU perished during the wildfire. While the burn was extremely patchy in nature, the western portion of the FMU was dominated by Lehmann's lovegrass and due to the higher fuel loads on this end, any cacti growing in this area were likely killed by the higher fire intensity.

### **B. Factors affecting species environment within the action area**

Pineapple cactus within the action area are protected from most of the threats faced by this species off the Refuge such as urban development, mining, and recreational off-road vehicle use. However, ground disturbances from Arizona Department of Transportation maintenance activities, specifically the clearing of a 30-foot recovery zone in some areas along the sides of SR 286, may disturb individuals that may be growing near the road side. Past road improvement projects, such as a bridge replacement and road realignment, may have resulted in the loss of individuals. Several acres of habitat were converted to highway roadway. In addition, several roadside fires have impacted the habitat along the highway.

Human disturbance in the action area, while localized, could have a substantial effect on pineapple cactus. Wildlife-related recreational activities on the Refuge are not thought to affect pineapple cactus as these activities are primarily in developed areas of the Refuge. A more serious human disturbance is the large number of undocumented aliens and drug traffickers moving through the action area. New trails are created regularly, and campfires left unattended or used to signal for help pose substantial threat to this cactus. In addition, the use of off-highway vehicles by Border Patrol while monitoring and apprehending these individuals could present a significant impact on this species.

Prescribed fire has been used as a habitat management tool on the Refuge since it was established. The effects of a decade of prescribed fire on the spread of Lehmann lovegrass has yet to be evaluated.

### **EFFECTS OF THE ACTION**

Effects of the action refer to 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, which 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. Indirect effects are those that are caused by the action and are later in time, but are still reasonably certain to occur.

The total acreage of the City Hall Fire was approximately 5,312 acres. Initial attack occurred when the fire was about 200 acres in size. The decision to allow the City Hall Fire to burn, with the boundary of the City Hall FMU, resulted in burning approximately 5,112 acres after the initial attack.

Actions associated with the City Hall Fire may have resulted in the loss of pineapple cactus that may have been present in the FMU as predicted by the Refuge habitat model. However, no historical locations are known from this unit, nor were any pineapple cactus found in the 25% of the unit surveyed in 2002. Therefore, it is uncertain if any individuals were impacted by this action. The presence of Lehmann's lovegrass in the western portion of the FMU would have resulted in higher fuel loads and higher intensity burning in this area. The sparsely vegetated eastern portion would have been a lower intensity fire and would be less likely to result in mortality of individuals if present. There were no ground-disturbing activities as part of the fire suppression.

## **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 action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Effects from undocumented aliens crossing the Refuge are expected to continue, resulting in new trails and wildfires from unattended fires. Since the Refuge is Federal, all authorized actions affecting listed or proposed species will undergo section 7 consultation.

## **CONCLUSION**

After reviewing the current status of Pima pineapple cactus the environmental baseline for the action area, the effects of the emergency fire suppression activities and the cumulative effects, it is the Service's biological opinion that the actions, as implemented by the Refuge fire program did not jeopardize the continued existence of the Pima pineapple cactus. No critical habitat has been designated for Pima pineapple cactus. Therefore, no critical habitat was affected for this species. Our findings are based upon the following:

1. Surveys were partially completed within the unit prior to the wildfire and suppression activities. No individuals were found.
2. No historical location of Pima pineapple cactus are known from the City Hall FMU.
3. There were no ground-disturbing activities as part of the fire suppression activities.

4. The suppression decisions and actions contained the fire within the City Hall FMU, and the acreage was limited to approximately 5,312 acres.

### **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 further defined 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 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.

### **EXTENT OF TAKE**

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 affects of an action on listed species or critical habitat, to help implement recovery plans, or to develop information.

We believe additional opportunities may exist during fire suppression operations to minimize impacts and protect habitat for listed species and include the following conservation recommendations:

1. Post-fire cacti surveys should be conducted over the areas surveyed pre-fire to collect data on detectability rather than further inventory of already impacted areas. This will aid in the evaluation of the survey technique in varying habitats.

2. We recommend that the Refuge ground truth the Pima pineapple cactus model to determine its accuracy and to assist in completing an inventory of available habitat on the Refuge.

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.

We appreciate the Refuge's efforts to identify and minimize effects to listed species from this project. For further information please contact Marty Tuegel at (520) 670-4778 or Sherry Barrett at (520) 670-4617. Please refer to the consultation number, 02-21-02-M-0138, in future correspondence concerning this project.

/s/ Steven L. Spangle

cc: Assistant Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)  
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## Appendix A

### CONCURRENCES

This section contains all concurrences with “may affect, not likely to adversely affect” and not likely to jeopardize” determinations.

#### **Masked Bobwhite Quail (*Colinus virginianus ridgwayi*)**

##### **Environmental Baseline**

Approximately 80 percent of the Refuge is current or potential masked bobwhite quail habitat. Quail have been released in numerous locations throughout the Refuge grasslands, and have dispersed throughout. In 2001, a population of 644 individuals were estimated based upon call count surveys (Hunnicut, pers. com.). They are most likely in the valley bottom, and least likely to be found in the foothills, Brown Canyon, and in the riparian areas. The species has spread to areas off-Refuge, as well, with reports as far north as 5 miles north of the Refuge on Highway 286 and on Rancho de la Osa west of Sasabe.

Masked bobwhite were released in 1997 in the northeast portion of City Hall FMU. However, for at least the last 2 breeding seasons, none were detected in this FMU during the call count surveys. It is suspected that the wildfire in 2002 caused reduction in habitat quality by removing understory, killing older, large diameter mesquites, and top killing most of the remainder of the trees. The decision to allow the fire to burn out may have reduced the habitat quality in the short-term, but may result in better habitat in the near future.

##### **Conclusion**

After reviewing the status of the masked bobwhite quail, the environmental baseline for the action area, and the effects of the proposed action, the Service concurs that the proposed action may affect, but is not likely to adversely affect masked bobwhite quail, based upon the following:

1. There have been no confirmed locations in this FMU within the past two years of surveys.
2. The core area of the Refuge for this species is further south.
3. All adult birds should be mobile and habitat is available in other units.

#### **Cactus Ferruginous Pygmy-Owl (*Glaucidium brasilianum cactorum*)**

##### **Environmental Baseline**

Pygmy-owls have been documented in locations throughout the Altar Valley. There have been several pygmy-owls observed in location on the Refuge and nesting has been documented along

Arivaca Creek and in an area near Carrizo Dam. During winter/spring of 2001 a female resided for many weeks in the eastern end of Santa Margarita Wash. During the fall/winter of 2002, another female spent time in the vicinity of Lopez wash in the central portion of the Refuge. During the late winter 2002, another female was discovered in Brown Wash, east of Brown Canyon. Arizona Game and Fish Department has documented the species use of other mesquite dominated washes on the Refuge. However, most of these have been dispersing birds or females searching for an unpaired male. The Refuge currently documents that less than 5 % of the Refuge is appropriate nesting habitat for the owl, but this area is still an important dispersal route through the watershed.

Pygmy-owl habitat quality within the City Hall FMU was considered marginal, based upon the habitat evaluation assessment criteria developed by Flesch (1999). The FMU burned in 2000 during a wildfire and there was a massive amount of top-kill of small diameter mesquites in the upland portions of the unit and sparsely vegetated drainages. Drainages in the FMU were evaluated during the winter of 2001 to determine the need for pygmy-owl surveys, but the Refuge's habitat assessment ranked them too low to need surveys. While there is one known saguaro within the FMU, it lacks cavities necessary for it to be used as a potential nest site.

### **Conclusion**

After reviewing the status of the pygmy-owl, the environmental baseline for the action area, and the effects of the proposed action, the Service concurs that the action may affect, but is not likely to adversely affect cactus ferruginous pygmy-owl, based upon the following:

1. The habitat quality in the FMU for this species is marginal.
2. There has been no documented occurrence of this species within the FMU.
3. There are no known nest sites or nesting habitat within a 1/4 mile of the FMU.

TABLES AND FIGURES

Figure 1. Action Area - City Hall Fire Management Unit.

