



Arizona Ecological Services

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BIOLOGICAL OPINIONS

Title	Location	Action Agency	Listed Species Affected	D O
Construction of a Bridge at Palo Parado between Interstate 19 and Pendleton Road (22410-2011-F-0138)	Santa Cruz County, Arizona	Army Corps of Engineers	Gila topminnow	A 20
Interstate 40 Widening Project (22410-2011-F-0020)	Coconino County, Arizona	Federal Highway Administration	Mexican spotted owl	M 20
Final Biological Opinion on the Clean Water Act 404 Permit Associated with Proposed Restoration of the Gila River at Apache Grove (22410-2010-F-0487)	Greenlee County, Arizona	Army Corps of Engineers	southwestern willow flycatcher, razorback sucker, and Chiricahua leopard frog	M 20
Revision to the Final Biological Opinion on the Virgin River Gorge (Gorge) Rotenone Treatment between the Stateline Fish Barrier in Washington County, Utah, and the Virgin River Gorge Fish Barrier, Mohave County, Arizona and Washington County, Utah (22410-2010-F-0567 R1)	Mohave County, Arizona and Washington County, Utah	Fish and Wildlife Service	woundfin and Virgin River chub	M 20
Biological Opinion on the Control Road Bridge Replacement (22410-2010-F-0587)	Gila County, Arizona	Federal Highway Administration	Chiricahua leopard frog	M 20
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 (22410-2005-F-0243 R3)	Pima County, Arizona	US Fish and Wildlife Service	Pima pineapple cactus, masked bobwhite quail, Chiricahua leopard frog, and Gila topminnow	F 1,
Biological Opinion on the proposed Wenima Wildlife area Stream restoration Project (22410-2010-F-0584)	Apache County, Arizona	Army Corps of Engineers	Little Colorado spinedace	J 3
Biological Opinion on Mittry and Quigley Hazardous Fuel Reduction Project (22410-2011-F-0025)	Yuma County, Arizona	Bureau of Land Management	Yuma clapper rail	J 20
Biological Opinion for the Proposed Greenwood Community Grazing Allotment Permit Renewal (22410-2010-F-0442)	Mohave County, Arizona	Bureau of Land Management	southwestern willow flycatcher	D 11

Canyon, and Fairchild Grazing Allotments in the Peloncillo Mountains (22410-2008-F-0369)				
Biological Opinion on the Wildbunch Allotment Management Plan (22410-2001-F-0211-R1)	Greenlee County, Arizona	Apache-Sitgreaves National Forests	Mexican spotted owl, Chiricahua leopard frogs, loach minnow, spikedeace, and Gila chub	A 20
Biological Opinion on the Proposed Mount (Mt.) Graham Summerhome Special Use Permit Residence Renewals (22410-2007-F-0163)	Graham County, Arizona	Coronado National Forest	Mt. Graham red squirrel	A 20
Biological and Conference Opinion on the Malpai Borderlands Habitat Conservation Plan, Arizona and New Mexico (22410-2006-F-0408)	Arizona and New Mexico	US Fish and Wildlife Service and Natural Resource Conservation Service	Chiricahua leopard frog, beautiful shiner, Yaqui catfish, Yaqui chub, Yaqui topminnow, Huachuca water umbel, Mexican spotted owl, New Mexico ridge-nosed rattlesnake, northern aplomado falcon, and western yellow-billed cuckoo	A 20
Biological Opinion on the Proposed Phase II Utility Maintenance in Utility Corridors on Arizona Forests (22410-2007-F-0365)	Apache, Coconino, Gila, Greenlee, Maricopa, Navajo, Pinal, and Yavapai	US Forest Service	Mexican spotted owl, southwestern willow flycatcher, and loach minnow	Jt 20
Biological Opinion for the Proposed Buffelgrass Control on the Santa Rita Experimental Range Project (22410-2008-F-0130)	Pima County, Arizona	US Fish and Wildlife Service	Pima pineapple cactus	Jt 20
Addendum to the Biological Opinion for the Grand Canyon National Park Fire Use Program (02-21-02-F-0118)	Coconino County, Arizona	Grand Canyon National Park	Mexican spotted owl	Jt 20
Biological Opinion for the Proposed Improvements to State Route 86 between Sandario Road and Kinney Road (22410-2008-F-0281)	Pima County, Arizona	Federal Highway Administration	Pima pineapple cactus	Jt 20
Biological Opinion for the Proposed Changes to the Term permit to Graze Livestock on the Little Green Valley Complex Allotments (22410-1999-F-0300 R2) Appendix 1: Survey Data (2.7 MB)	Gila County, Arizona	Tonto National Forest	Chiricahua leopard frog	Jt 20
Final Biological Opinion on State of Texas Bat Gate Installation (22410-2008-F-0364)	Cochise County, Arizona	National Park Service -- Coronado National Memorial	lesser long-nosed bat	Jt 20
Biological Opinion on Renovation of Cibola High Levee Pond (22410-2008-F-0348)	La Paz County, Arizona and Imperial County, California	US Fish and Wildlife Service	razorback sucker and bonytail	Jt 20
Reinitiated Programmatic Biological Opinion on the Effects of the Safford/Tucson Field Offices' Livestock Grazing Program,	Greenlee, Graham, Pinal, Cochise, and Pima counties Arizona	Bureau of Land Management	Kearney's blue star, Pima pineapple cactus, Nichol's Turk's head cactus, Arizona hedgehog cactus, Huachuca water umbel, Desert pupfish, Gila	Jt 20



United States Department of the Interior



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In Reply Refer to:
AESO/SE
22410-2008-F-0130

July 8, 2008

Memorandum

To: Partners for Fish and Wildlife, Arizona Ecological Services Office, Phoenix, Arizona

From: Assistant Field Supervisor

Subject: Buffelgrass Control on the Santa Rita Experimental Range Project

Thank you for your request for formal intra-Service consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) as amended (16 U.S.C. *et seq.*). Your request was dated March 10, 2008, and received by us on March 10, 2008. At issue are impacts that may result from the proposed buffelgrass (*Pennisetum ciliare*) control project on the Santa Rita Experimental Range (SRER) in Pima County, Arizona. You have determined that the project may adversely affect the endangered Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*, PPC), and may affect, but is not likely to adversely affect, the threatened Chiricahua leopard frog (*Lithobates chiricahuensis*). The basis for our concurrence on the Chiricahua leopard frog is provided in the Appendix of this document.

This biological opinion (BO) is based on information provided in the January 31, 2008, Intra-Service Section 7 Biological Evaluation Form (Partners for Fish and Wildlife 2008) and other sources of information. Literature cited in this BO is not a complete bibliography of all literature available on the species of concern, the effects from buffelgrass control projects, the project area, or other subjects considered in this opinion. A complete administrative record of this consultation is on file at the Arizona Ecological Services Office.

CONSULTATION HISTORY

March 10, 2008: We received your request for consultation and accompanying Intra-Service Section 7 Biological Evaluation Form.

June 26, 2008: We visited earthen stock tanks within 0.5 mile of proposed spraying sites to look for Chiricahua leopard frogs.

July 1, 2008: We provided a draft biological opinion to you for your review.

July 8, 2008: We received your comments on the draft biological opinion.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The goal of this project is to control the spread and reduce the extent of invasive buffelgrass (*Pennisetum ciliare*) on the SRER through the strategic and precise application of an appropriate herbicide for this project. The Federal action under consultation is use of Partners for Fish and Wildlife program funding to implement buffelgrass control. The success of this project will improve and protect habitat; ensure the integrity of desert scrub and semi-desert grassland habitat for other plants and animals; reduce the impacts of wildfire and weed control for adjacent landowners and road maintenance authorities; and protect the use of the SRER as a research and education facility.

A containment strategy will be used for spraying the herbicide. This strategy puts highest priority on spraying isolated satellite populations and the perimeters of large populations to control buffelgrass spread. As time permits, the size of the larger patches (up to 22 acres) will be reduced each year. The goal is to eliminate as many satellite populations as possible, and reduce the size of the larger patches. Reaching this goal will allow the SRER to institute a maintenance regime where they will spray the few, newly discovered satellite patches and continue to reduce the size of the larger patches. This maintenance regime should require much less effort and resources than the initial reduction project.

Buffelgrass will be treated and controlled with the herbicide, Glyphosate (e.g. Roundup Pro) [N-(phosphonomethyl) glycine, in the form of its isopropylamine salt), at an application rate of 2% concentration. Glyphosate N is the active ingredient. The herbicide will be mixed according to the label and it will include an inert marker dye, light blue, to ensure complete coverage and confirm that non-target plants were not sprayed. The herbicide will be applied to green and flowering buffelgrass during the period of active growth. The active growth period occurs from late July through mid-September in response to the summer monsoon rains.

Glyphosate will be applied to the foliage by a hand-held backpack sprayer using a coarse spray and following spray drift management procedures. Spray drift management includes: (1) preventing the herbicide solution to mist, drip, drift, or splash onto non-target plants, such as the endangered PPC, by applying the largest droplet size to sufficiently cover the buffelgrass without runoff; (2) preventing overspray onto native/non-target vegetation by using appropriate sized nozzles and tips; and (3) applying during low wind speeds from 2-10 miles per hour. It is anticipated that herbicide drift will be 2-3 inches from the buffelgrass plant, when spray drift management procedures are followed.

Glyphosate is readily translocated from the grass' leaves to the roots. Glyphosate has an average half life of 47 days in soil. It rapidly and readily adheres to soil, making its mobility/leaching potential low. Because it is bound by the soil, it is generally not absorbed by non-target plants through their roots.

The SRER will employ a 12-person Conservation Corps crew to apply the herbicide during a 6-7 day period in early August each year (2008 and 2009). Personnel from the SRER will transport the crews to buffelgrass populations and remain with them during spraying to ensure their safety and efficient-effective herbicide application. Additionally, personnel from the SRER will train all Conservation Corps employees to identify buffelgrass and any sensitive species such as PPC and agaves (*Agave spp.*). The only motorized vehicles used during this project will be for transport of sprayers to buffelgrass locations. All vehicles will stay on maintained roads and workers will walk to the exact spray sites.

Proposed Conservation Measures

The FWS and the applicant propose the following conservation measures to minimize the effects to PPC and its habitat:

- All pesticide applicators will be briefed on the PPC, basic habitat needs, and basic identification.
- Any PPC identified within 100 feet of a spraying site will be covered to ensure no drift of glyphosate reaches the cacti (a full PPC survey to protocol will not be conducted).
- The herbicide will be applied with backpack sprayers, allowing for better control of the spray. Additionally, spray drift management techniques will be employed to reduce the chances of native/non-target species being impacted by the herbicide. These include:
 - Applying the largest droplet size to sufficiently cover the buffelgrass without runoff, which prevents the herbicide solution from misting, dripping, drifting, or splashing onto non-target plants,
 - Using appropriately-sized nozzles and tips to preventing overspray onto native/non-target vegetation, and
 - Applying the herbicide during low wind speeds from 2-10 miles per hour.
- There will be no surface disturbance, as all motorized vehicles used during this project will stay on maintained roads, and workers will walk to the spray sites.

STATUS OF THE SPECIES

The Pima pineapple cactus (PPC) was listed as an endangered species without critical habitat on September 23, 1993 (58 FR 49875). Factors that contributed to the listing include habitat loss and degradation, habitat modification and fragmentation, limited geographical distribution and species rareness, illegal collection, and difficulties in protecting areas large enough to maintain functioning populations. A 5-year review was completed in 2007 and recommended no change to the cactus's classification as an endangered species (FWS 2007).

PPC occurs south of Tucson, in Pima and Santa Cruz counties, Arizona and adjacent northern Sonora, Mexico. In Arizona, it is distributed at very low densities throughout both the Altar and Santa Cruz valleys, and in low-lying areas connecting the two valleys. This cactus generally grows on slopes of less than 10 percent and along the tops (upland areas) of alluvial bajadas. The plant is found at elevations between 2,360 ft and 4,700 ft (Phillips *et al.* 1981, Benson 1982, Ecosphere 1992), in vegetation characterized as either or a combination of the Arizona upland of the Sonoran Desert scrub and semi-desert grasslands (Brown 1982). Several attempts have been made to delineate suitable habitat within the range of PPC (McPherson 2002, RECON Environmental Inc. 2006, FWS unpublished analysis) with very limited success. As such, we are still unable to determine exact ecological characters to help us predict locations of PPC or precisely delineate suitable habitat (FWS 2007).

As a consequence of its general habitat requirements, considerable suitable habitat for this species appears to exist in Pima and Santa Cruz counties, much of which is unoccupied. PPC occurs at low densities widely scattered, sometimes in clumps, across the valley bottoms and bajadas. The species can be difficult to detect, especially in dense grass cover. For this reason, systematic surveys are expensive and have not been conducted in much of its range. As a result, location information has been gathered opportunistically, either through small systematic surveys, usually associated with specific development projects, or larger surveys that are typically only conducted in areas that seem highly suited for the species. Furthermore, our knowledge of this species is gathered primarily through the section 7 process; therefore, we only see projects that require a Federal permit or have Federal funding. There are many projects that occur within the range of PPC that do not undergo section 7 consultation, and we have no information regarding the status or loss of plants or habitat associated with those projects. For these reasons, it is difficult to address abundance and population trends for this species.

Recent investigation of taxonomy and geographical distribution focused in part on assessing the validity of the taxon (see Baker 2004, Baker 2005, and Schmalzel *et al.* 2004). Although there is evidence for a general pattern of clinal variation across the range of the species (Schmalzel *et al.* 2004), this does not preclude the recognition of taxonomic varieties within *C. robustispina*. Baker (2005) found that there are distinct geographical gaps between the distribution of this subspecies and the other subspecies, which occur in southeastern Arizona, New Mexico, and Texas, and that the subspecies are morphologically coherent within their respective taxa (Baker 2004). His geographical and morphological work supports the idea that the sub-specific groups within *C. robustispina* are indeed discrete and merit separate taxonomic status as subspecies (FWS 2007).

Six demographic plots were established in 2002 in the Altar Valley. The results from the first year (2002-2003) indicate that the populations were stable; out of a total of over 300 PPC measured, only 10 died, and two PPC seedlings were found (Routson *et al.* 2004). The plots were not monitored in 2004, but were visited again starting in May 2005. In the two years between September 2003 and September 2005, 35 individuals, or 13.4%, of the original population had died (mostly during the summer months), and no new seedlings were found (Baker 2006). Baker (2006) suggests that recruitment likely occurs in punctuated events in response to quality and timing of precipitation, and possibly temperature, but there is little evidence until such events occur. He goes on to say that further observations need to be made to determine the rate at which the population is declining, because, based on an overall rate of die-

off of 13.4% every two years, few individuals will be alive at this site after 15 years. As this monitoring program continues, critical questions regarding the life cycle of this species will be answered.

The major pollinator of PPC is *Diadasia rinconis*, a ground-nesting, solitary, native bee. McDonald (2005) found that PPC plants need to be within approximately 600 m (1,969 ft) of each other in order to facilitate effective pollination. PPC plants that are located at distances greater than that from one another become isolated. The species is an obligate outcrosser (not self-pollinating), so it is important for plants to be within a certain distance to exchange pollen with each other. Also, the study found that pollination was more effective when other species of native cacti are near areas that support PPC. The native bees also pollinate other species of native cacti and the sole presence of PPC may not be enough to attract pollinators.

The AGFD maintains the Heritage Data Management System (HDMS), a database identifying elements of concern in Arizona and consolidating information about their distribution and status throughout the state. This database has 5,553 PPC records, 5,449 PPC of which have coordinates. Some of the records are quite old, and we have not confirmed whether the plants are still alive. We also cannot determine which plants may be the result of multiple surveys in a given area. Of the known individuals (5,553), approximately 1,340 PPC plants are documented in the database as extirpated. We do know the number of PPC that have been detected during surveys for projects that have undergone section 7 consultation. For projects we have tracked between 1997 and 2003, approximately 1,168 PPC (21% of the known individuals) were destroyed, removed, or transplanted as a result of residential and commercial development, indicating that development is a continuing threat for the species. This percentage may or may not be representative of the loss due to development in southern Arizona. It is difficult to quantify the total number of PPC throughout its range that have been lost to development or the rate of habitat loss. There are two reasons for this: (1) we review only a small portion of development projects within the range of PPC (those with Federal involvement); and (2) residential development that takes place without any jurisdictional oversight or permit is not tracked within Pima and Santa Cruz counties. The HDMS database is dynamic, based on periodic entry of new information, as time and staffing allows. As such, the numbers used from one biological opinion to the next may vary and should be viewed as a snapshot in time at any given moment. We have not recorded the loss of habitat because very few biological assessments quantify habitat for PPC. Prior to 1997, we are not able to quantify the loss of PPC, as much of the information is survey-based as opposed to project-based. We know the fate of PPC detected on project sites associated with section 7 consultations; we do not know if PPC detected during pre-1997 surveys are still present because the surveys have not been repeated.

Threats to PPC continue to include habitat loss and fragmentation, competition with nonnative species, and inadequate regulatory mechanisms to protect this species. We believe residential and commercial development, and its infrastructure, is by far the greatest threat to PPC and its habitat. However, we have no way of tracking the cumulative amount of development within the range of PPC. What is known with certainty is that development pressure continues in Pima and Santa Cruz counties.

Invasive grass species may be a threat to the habitat of PPC. Habitat in the southern portion of the Altar Valley is now dominated by Lehmann lovegrass (*Eragrostis lehmanniana*). According to Gori and Enquist (2003), Boer lovegrass (*Eragrostis chloromelas*) and Lehmann lovegrass are

now common and dominant on 1,470,000 acres in southeastern Arizona. They believe that these two grass species will continue to invade native grasslands to the north and east, as well as south into Mexico. These grasses have a completely different fire regime than the native grasses, tending to form dense stands that promote higher intensity fires more frequently. Disturbance (like fire) tends to promote the spread of these nonnatives (Ruyle *et al.* 1988, Anable *et al.* 1992). Halvorson and Roller (1997) hypothesized that fire-induced mortality of PPC increases with Lehmann lovegrass density. Buffelgrass (*Pennisetum ciliare*) has become quite dominant in vacant areas in the City of Tucson and along roadsides, notably in the rights-of-way along Interstate 10 and State Route 86. Some portions of PPC habitat along these major roadways are already being converted to dense stands of buffelgrass.

The Arizona Native Plant Law may delay vegetation clearing on private property for the salvage of specific plant species within a 30-day period. Although the Arizona Native Plant Law prohibits 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. Even if PPC are salvaged from a site, transplanted individuals are not considered as functioning within the context of a self-sustaining population. Transplanted PPC have low levels of survival, and past efforts to transplant individual PPC to other locations have had only limited success. For example, on two separate projects in Green Valley, the mortality rate for transplanted PPC after two years was 24% and 66%, respectively (SWCA, Inc. 2001, WestLand Resources, Inc. 2004). One project southwest of Corona de Tucson involved transplanting PPC into areas containing *in situ* plants. Over the course of three years, 48% of the transplanted individuals and 24% of the *in situ* individuals died (WestLand Resources, Inc. 2008). As a result, transplanted PPC are not likely to contribute significantly to the overall population. There is also the unquantifiable loss of the existing PPC seed bank associated with the loss of suitable habitat. Furthermore, once individuals are transplanted from a site, PPC is considered to be extirpated, as those individuals functioning in that habitat are irretrievably lost.

Pima County regulates the loss of native plant material associated with ground-disturbing activities through their Native Plant Protection Ordinance (NPPO) (Pima County 1998). The NPPO requires inventory of the site and protection and mitigation of certain plant species slated for destruction by the following method: the designation of a minimum of 30% of on-site, permanently protected open space with preservation in place or transplanting of certain native plant species from the site. There are various tables that determine the mitigation ratio for different native plant species (e.g. saguaros (*Carnegiea gigantea*), ironwood trees (*Olneya tesota*), PPC) with the result that mitigation may occur at a 1:1 or 2:1 replacement ratio. Mitigation requirements are met through the development of preservation plans. The inadvertent consequence of this ordinance is that it has created a “market” for PPC. Any developer who cannot avoid this species or move it to another protected area must replace it. Most local nurseries do not grow PPC (and cannot grow them legally unless seed was collected before the listing). As a result, environmental consultants are collecting PPC seed from existing sites (which can be done with a permit from the Arizona Department of Agriculture and the permission of the private landowner), germinating seed, and placing PPC plants grown from seed back on these sites. This exercise probably has limited conservation benefit for the species, as it is somewhat of a gardening experiment with very little control or oversight, and a high degree of uncertainty of lasting success. There have been no long-term studies of transplant projects. It also does not address the loss of habitat.

Other specific threats that have been previously documented (FWS 1993), such as overgrazing, illegal plant collection, prescribed fire, and mining, have not yet been analyzed to determine the extent of effects to this species. However, partial information exists. Overgrazing by livestock, illegal collection, and fire-related interactions involving exotic Lehmann lovegrass and buffelgrass may negatively affect PPC populations. Mining has resulted in the loss of hundreds, if not thousands, of acres of potential habitat throughout the range of the plant.

The protection of PPC habitat and individuals is complicated by the varying land ownership within the range of this species in Arizona. An estimated 10% of the potential habitat for PPC is held in Federal ownership. The remaining 90% is on Tribal, State, and private lands. Most of the federally-owned land is either at the edge of the plant's range or in scattered parcels. The largest contiguous piece of federally-owned land is the Buenos Aires National Wildlife Refuge, located at the southwestern edge of the plant's range at higher elevations and with lower plant densities. No significant populations of PPC exist in Sonora or elsewhere in Mexico (Baker 2005).

There have been some notable conservation developments for this species. There are two conservation banks for PPC, one on a private ranch in the Altar Valley and another owned by Pima County that includes areas in both the Altar Valley and south of Green Valley. Nine projects have used the bank to mitigate the loss of PPC and habitat from residential and commercial development (FWS 2007). Pima County and the City of Tucson's large-scale conservation efforts for this species are not yet complete, but strategies for PPC conservation will likely include additional conservation banks, acquisition of occupied and suitable PPC habitat, a revision of both the City and County ordinances dealing with native plant protection, and provisions for the protection of PPC and habitat within subdivisions.

In summary, PPC conservation efforts are currently hampered by a lack of information on the species. Specifically, we have not been able to determine exact ecological characters to help us predict locations of PPC or precisely delineate its habitat, and considerable area within the PPC range has not been surveyed. Further, there are still significant gaps in our knowledge of the life history of PPC; for instance, we have yet to observe a good year for seed germination and, with the exception of a few personal observations from researchers, we have not identified the seed dispersal agent(s). Demographic plots have been only recently established, and it will be years before we have enough information to assess population dynamics for PPC in the Altar Valley.

Development and associated loss of habitat remains the primary and continuing threat to this taxon. The expanding threat of nonnative grasses and resulting altered fire regimes remain a serious concern for the long-term viability of the species. The full impact of drought and climate change on PPC has yet to be studied, but it is likely that, if recruitment occurs in punctuated events based on precipitation and temperature (Baker 2006), PPC will be negatively affected by these forces. Conservation efforts that focus on habitat acquisition and protection, like those proposed by Pima County and the City of Tucson, will be important elements that will contribute to the long-term viability of this taxon. Regulatory mechanisms, such as the native plant protection ordinances, will provide conservation direction for PPC habitat protection within subdivisions, and may serve to reduce PPC habitat fragmentation within the urban areas of projected growth.

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 from which to assess the effects of the action now under consultation.

For this project, we define the action area as the specific buffelgrass patches to be sprayed along with a 165-foot “radius of influence” for each patch. This “radius of influence” is the area within which buffelgrass would likely spread if treatment does not occur (Dr. Mitch McClaran, University of Arizona, pers. comm., 2008); therefore, this is the area that will be impacted by this project. With careful backpack application of the herbicide, drift is minimal (2-3 inches), so the total area encompassed by this project, and the extent of the action area, is 970 acres (Figure 1).

The SRER has not been surveyed to protocol for PPC; therefore, we do not know how many individual cacti are located within the action area. We may assume that the entire 970 acres within the action area is PPC habitat, as PPC are known to be present on the range; however, dense stands of buffelgrass can turn previously suitable areas for PPC into unsuitable areas for the cactus, so it is likely that the total amount of PPC habitat within the action area is less than 970 acres.

The approximately 51,000-acre SRER is the longest continuously active rangeland research facility in the United States. Since 2002, the extent and distribution of buffelgrass on the SRER has greatly increased from a few isolated patches to rapidly enlarging patches and isolated satellite populations established far (>2 miles) from existing populations. The >400 known patches of buffelgrass influence the habitat quality and vegetation dynamics within the action area. The most rapid spread of buffelgrass is in ephemeral washes radiating from known populations.

Buffelgrass has become a highly invasive weed in south-central Arizona and northwestern Mexico, and in 2005 it was added to Arizona’s Noxious Weed List because of its invasive nature. If nothing is done to stop this trend, the spread and increase of buffelgrass has the potential to convert large areas of desert scrub and semi-desert grasslands to buffelgrass communities that will be prone to hot and frequent wildfires and will no longer support the current diversity of endangered and sensitive species, or research and education uses on the SRER. This project will protect PPC habitat and benefit the long-term survival of the native species on the SRER.

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 or 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 proposed action and are later in time, but are still reasonably certain to occur.

The proposed action will not result in the direct loss of any known Pima pineapple cactus within the action area. Crew members will be trained to identify PPC, and PPC that are casually discovered within 100 feet of a buffelgrass plant to be sprayed will be covered with a small plastic or cardboard cone while the buffelgrass is treated. Once the spraying is complete, the cover will be removed from the cactus. Because a full survey to protocol will not be conducted prior to implementation of the proposed action, it is possible an unknown number of PPC will be affected by the spraying. The cuticle on cacti offers protection from damage, and if glyphosate contacts a PPC, the effect would likely be minimal because of this protection. However, literature on the effects of Glyphosate on cacti is incomplete, and the possibility exists that Glyphosate may adversely effect PPC. In one document found on-line (see<http://www.ipmcenters.org/cropprofiles/docs/Cacactuspear.html>), cactus pear (prickly pear) growers in California state that no registered herbicides are currently available for weed control use on cactus crops, although some growers are working towards registering Glyphosate as a spot treatment for weed control in cactus crops. This implies that using Glyphosate to control weeds around prickly pear cacti is regarded as an appropriate means of weed control, at least by cactus growers; however, the effects of Glyphosate on cacti in general, and PPC specifically, are unknown.

Direct effects to PPC habitat due to the proposed action are not anticipated. The amount of disturbance associated with this project is considered insignificant, as the proposed action does not involve surface disturbance that would damage or destroy the soil and seed bank. Vehicles will travel on established roads and the crew will walk to each site, where they will apply glyphosate using a backpack sprayer while incorporating spray drift management techniques (sufficiently covering the buffelgrass without runoff; preventing overspray onto native/non-target vegetation; and applying the product during low wind speeds from 2-10 miles per hour). These measures minimize surface disturbance and the potential for overspray while maximizing the effectiveness of the herbicide on the target plant.

Indirect effects to PPC and its habitat within the action area are expected to be beneficial, as removing stands and controlling the spread of buffelgrass benefits PPC by reducing competition and threat of fire. According to the Southern Arizona Buffelgrass Strategic Plan (Buffelgrass Working Group 2008), buffelgrass tends to colonize roadsides and disturbed areas, but can move into surrounding deserts and grow into dense stands, crowding out native plants. Competition for water can weaken and kill desert plants, while the dense roots and ground shading of buffelgrass prevent germination of native seeds. Buffelgrass alone can kill or exclude most native plants by these processes, but buffelgrass-fueled wildfires can hasten the process. While all areas within the 970-acre action area have not been completely invaded by buffelgrass, it has the potential to spread into all areas if untreated. By removing buffelgrass from around PPC and within its habitat, the adverse effects created by buffelgrass are reduced, and the likelihood PPC habitat will continue to function is increased.

In summary, this project will may result in damage to or loss of an unknown number (likely a small number) of PPC and may temporarily affect up to 970 acres of PPC habitat. However, these effects are offset by the long-term benefits provided by controlling the spread of buffelgrass and reducing its footprint within the action area.

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 ESA.

The SRER is owned by the Arizona State Land Department, but operated and managed by the University of Arizona through a Special Use Lease. While unlikely, the chance exists that this lease may not be renewed, and all or portions of the 51,000 acres of the SRER, including the action area, could be sold for development in the future, which could result in loss of most or all PPC and habitat in the action area. The action area is also frequented by undocumented migrants and smugglers, who leave trash, create trails, and may start fires. These activities adversely affect PPC and its habitat.

CONCLUSION

After reviewing the current status of PPC, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of PPC. No critical habitat has been designated; therefore, none will be affected. We make this determination because:

- All pesticide applicators will be briefed on the PPC, basic habitat needs, and basic identification.
- Any PPC identified within 100 feet of a spraying site will be covered to ensure no drift of glyphosate reaches the cacti.
- The herbicide will be applied with backpack sprayers, allowing for better control of the spray. Additionally, spray drift management techniques will be employed to reduce the chances of native/non-target species being impacted by the herbicide. These include:
 - Applying the largest droplet size to sufficiently cover the buffelgrass without runoff, which prevents the herbicide solution from misting, dripping, drifting, or splashing onto non-target plants,
 - Using appropriately-sized nozzles and tips to preventing overspray onto native/non-target vegetation, and
 - Applying the herbicide during low wind speeds from 2-10 miles per hour.
- There will be no surface disturbance, as all motorized vehicles used during this project will stay on maintained roads, and workers will walk to the spray sites.

INCIDENTAL TAKE STATEMENT

Sections 7(b)(4) and 7(o)(2) of the ESA do not apply to listed plant species. However, protection of listed plants is provided to the extent that the ESA requires a Federal permit for removal or reduction to possession of 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. Neither incidental take authorization nor recovery permits are needed from us for implementation of the proposed action.

CONSERVATION RECOMMENDATIONS

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

We have no conservation recommendations.

REINITIATION NOTICE

This concludes formal intra-service consultation on proposed Buffelgrass Control on the Santa Rita Experimental Range Project. 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 (not applicable to this consultation); (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.

We appreciate your efforts to identify and minimize effects from this project. Please contact Marit Alanen at (520) 670-6150 (x234) or Jim Rorabaugh at (520) 670-6150 (x230) if you have further questions. Please refer to consultation number 22410-2008-F-0130 in future correspondence regarding this project.

/s/ Jason Douglas for

Steven L. Spangle

cc: Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ (Attn: Joan Scott)

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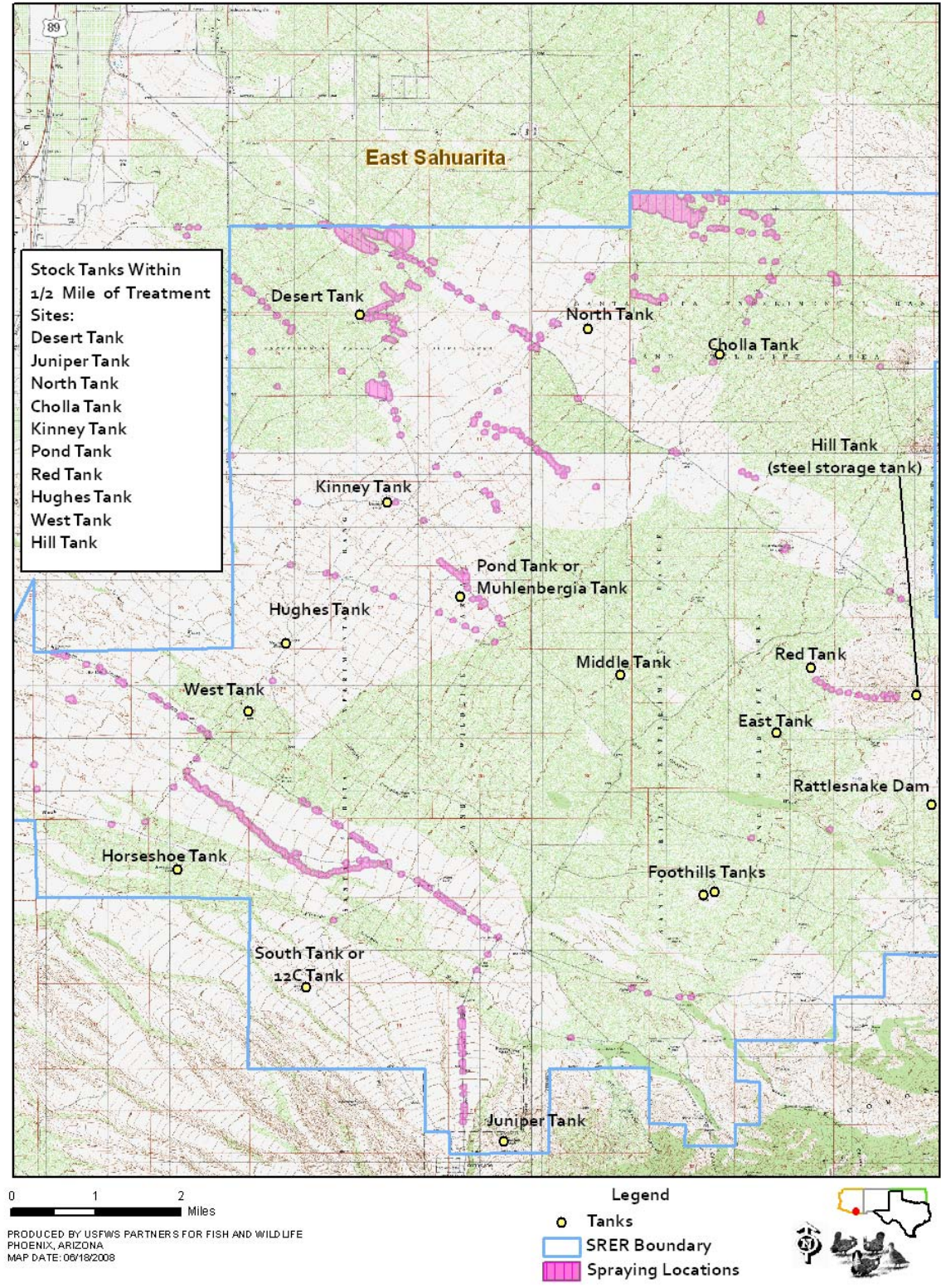


Figure 1. Map showing buffelgrass patches to be treated and stock tank locations on the Santa Rita Experimental Range. Stock tanks within 0.5 mile of a treatment site are listed in the upper left.

APPENDIX – CONCURRENCE

The appendix contains our concurrence with your determination that the proposed action may affect, but is not likely to adversely affect, the Chiricahua leopard frog (*Lithobates chiricahuensis*). This concurrence is based on the full implementation of the proposed action as described in the Description of the Proposed Action section of the Biological Opinion, including the conservation measures proposed by the applicant.

Chiricahua leopard frog

The Chiricahua leopard frog (CLF) inhabits primarily perennial streams, springs, and marshes, as well as stock ponds in southeastern Arizona and southwestern New Mexico, and along the Mogollon Rim and associated mountain ranges in both states. In Mexico, it extends through northeastern Sonora and western Chihuahua. Within stream or spring systems, the CLF is frequently associated with deep pools or ponds.

The closest known extant population of CLFs to the SRER is on the east side of the Santa Rita Mountains in Louisiana Gulch (north of Gardner Canyon). There are no CLF records on the SRER. The closest historical records are from Box, Florida, and West Sawmill canyons, but no frogs have been observed at these localities since 1999 (Box Canyon). Following the guidelines outlined for the CLF in the Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service (FWS 2004), a survey of all stock tanks within 0.5 mile of buffelgrass areas to be sprayed at the SRER was conducted on June 26, 2008. All stock tanks within this buffer were dry. Therefore, we believe the effects to CLF will be insignificant and discountable.

CONSERVATION MEASURES

- In 2009, stock tanks within 0.5 mile of buffelgrass stands to be treated will be surveyed for CLF prior to treatment. If one or more stock tanks are found to be occupied by CLF at that time, treatment of buffelgrass will not occur within 0.5 mile of the occupied stock tank(s).

DETERMINATION OF EFFECTS

We concur with your determination that this project may affect, but is not likely to adversely affect, the CLF for the following reasons:

- No Chiricahua leopard frog localities (historical or current) are known from the action area.
- Surveys for Chiricahua leopard frogs in the action area were negative.

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U.S. Fish and Wildlife Service (FWS). 2004. Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service. U.S. Fish and Wildlife Service Region 2 Environmental Contaminants Program. Albuquerque, NM. 203 pp.