



United States Department of the Interior

Fish and Wildlife Service Arizona Ecological Services Office

9828 N. 31st Avenue Ste C3
Phoenix, AZ 85051

Telephone: (602) 242-0210 Fax: (602) 242-2513



In reply refer to:

AESO/SE

22410-1999-F-0300-R001

22410-2008-F-0498-R001

November 17, 2017

Ms. Debbie Cress
District Ranger, Payson Ranger District
Tonto National Forest
1009 Highway 260
Payson, Arizona 85541

RE: Reinitiation of Consultation for the Continued Authorization of a Term Livestock Grazing Permit on the Diamond Rim Allotments

Dear Ms. Cress:

Thank you for your request for formal consultation/conference 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). We received your March 3, 2017, request for consultation on the same day; and the November 2016 Draft Biological Assessment (BA) for the Diamond Rim Allotments on March 27, 2017. At issue are impacts that may result from the issuance of a 10-year Term Livestock Grazing Permit authorizing continued livestock grazing on the Diamond Rim Allotments located in Gila County, Arizona. The proposed action may affect the threatened Chiricahua leopard frog (*Lithobates chiricahuensis*) and its designated critical habitat.

In your letter, you requested our concurrence that the proposed action is not likely to adversely affect the threatened Gila trout (*Oncorhynchus gilae*), Mexican spotted owl (*Strix occidentalis lucida*), and narrow-headed gartersnake (*Thamnophis rufipunctatus*). You also determined that the proposed action is not likely to adversely affect the Mexican spotted owl's designated critical habitat and the narrow-headed and northern Mexican (*Thamnophis eques megalops*) gartersnake's proposed critical habitat. We concur with your determination and the basis for our concurrence is found in Appendix A.

You also determined that the action would have "no effect" on northern Mexican gartersnake. "No effect" determinations do not require our review and are not addressed further.

Your letter concluded that the proposed project may affect and is not likely to adversely affect the proposed headwater chub (*Gila nigra*). The proposal to list the headwater chub as a threatened species (USFWS 2015) was withdrawn on April 7, 2017 (USFWS 2017). Consultation on this species is no longer required and will not be addressed further in this letter.

This biological opinion is based on information provided in the official biological assessment (BA), 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, livestock grazing, and its effects, or on other subjects considered in this opinion. A complete record of this consultation is on file at this office.

Consultation History

- November 17, 2004: Completed consultation for Livestock grazing in the Little Green Valley Complex (22410-1999-F-0300-R1).
- July 1, 2008: Reinitiated Little Green Valley Complex consultation for the Chiricahua leopard frog (22410-1999-F-0300-R2).
- April 4, 2013: Initiated consultation on the Reauthorization of the Little Green Valley Complex Grazing Allotments, Prescribed Fire and Fuel Treatments, Introductions of Native Wildlife, and Habitat Renovations on the East Verde River.
- January 21, 2015: Your agency withdrew the consultation request.
- December 21, 2016: We participated in a site visit to several areas within the Cross V (East Verde Pasture), Green Valley Allotment (Moore Pasture), and Indian Gardens (Dick Williams Pasture) that support habitat for listed species.
- January 3, 2017: We received an unofficial draft BA for the Diamond Rim Allotments.
- March 6, 2017: We received your request for formal consultation and an official draft BA.
- March 9, 2017: We provided comments on the unofficial draft BA.
- March 27, 2017: We received a corrected version of the official draft BA.
- April 3, 2017: We initiated formal consultation while our agencies agreed to continue working though and addressing outstanding consultation questions in the BA.
- April 20, 2017: We met to discuss the Proposed Action section.
- August 16, 2017: We asked for an extension to the week of September 18, 2017.
- September 20, 2017: An updated BA addressed maintenance and creation of livestock tanks.
- October 20, 2017: We sent you a draft biological opinion for review.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Tonto National Forest (Forest) proposes to continue authorization of livestock grazing for 10-years (the length of this biological opinion) on five allotments using an adaptive management strategy as defined in the Forest Service Handbook (FSH) 2209.13, Chapter 90. The Cross V, Green Valley, Indian Gardens, Payson, and Star Valley allotments, referred to as Diamond Rim Allotments, consist of approximately 163,752 acres and compose the central third of the Payson Ranger District. The proposed action would authorize management of these allotments as one operational unit or individual allotments to achieve resource objectives and management goals that are consistent with the Tonto's Land and Resource Management Plan (Forest Plan) standards, guidelines, and objectives.

Proposed permitted numbers would vary up to a maximum of 619 cow/calf pairs yearlong and 40 head of yearling carryover, equivalent to 10,050 animal unit months (AUMs) yearlong. Initial stocking will allow the base herd to increase incrementally through natural increase. The Forest anticipates that it will take several years to slowly increase the total size of the herd to the full numbers authorized by the permit. This will allow the Forest to adjust grazing schedules according to site-specific measures such as utilization, precipitation and growing conditions, forage recovery, need for rest or potential deferment, and the development of additional infrastructure to provide for adequate distribution of livestock across the area. Stocking levels will be based on a stock and monitor approach. Adjustments within the grazing season (i.e., calendar year of livestock grazing on an allotment(s); livestock would be moved into different pastures within the allotments throughout that grazing season) may be necessary based on monitoring results and successful implementation of management practices and would be achieved cooperatively with the Forest and the permittee.

Forage utilization would be managed at a level corresponding to light to moderate intensity (i.e., 30-40% on herbaceous key forage species; grazing intensity as depicted as a utilization level at the end of the growing season). Use of browse species and annuals would be limited to not more than 50% of current annual growth in order to provide for grazed plant recovery, increases in herbage production, and retention of herbaceous litter to protect soils. When utilization exceeds 40% on key species such as native perennial grasses in key areas, the Forest will modify management practices or take administrative actions necessary to reduce utilization during subsequent grazing seasons.

Grazing Schedule

The Forest proposes to continue yearlong use of the allotments and associated pastures incorporating single or multiple herds. Pastures would be available yearlong; they will not be used continuously for the entire year and may be used at any time during the year until forage utilization guidelines are met. All pastures that are available for grazing will be used in a rotational grazing system to allow for periodic rest during the growing season and complete recovery in order to accomplish other resource goals and objectives related to fire, fuels, or habitat needs.

Layout of the pastures generally favors use of upper elevation (above 5,500 feet) pastures in the summer months and low elevation pastures (below 5,000 feet) in winter months. However, some upper or lower elevation pastures could be used during either season depending on rainfall, growing conditions, vegetation type, and to prevent the establishment of patterns of repeated use. The goal will be to allow the complete deferment of individual pastures for up to a year or periodically, based on utilization levels, current resource conditions, and recovery. Pasture rotations will be determined between the Forest and permittee and documented in the Annual Operating Instructions (AOI). All pastures would be considered for use within the seasonal limitations of the forage resources in that pasture.

- Low elevation pastures: Catholic, Diamond West, Dry Pocket, Green Valley Hills, Hell's Half Acre, Holding East and West, Hole in the Ground, King's Ridge, Lion Springs, Lower Neal, Picket Pen, Star Valley, Upper Neal, Round Valley, and Winter Division.
- High elevation pastures: Bonita, Boy Scout, Brody, Dead Horse, Diamond East, Dick Williams, Dry Dude, Ellison, Girl Scout, Moore, Myrtle, Ponderosa, Robert's Mesa North and South, and East Verde.
- Mid-elevation pastures: Houston Mesa, Bean Patch, Beaver Valley, Flowing Springs (River), Butcher, Trap, and Birch Mesa, Shoofly.
- Pastures Closed to Grazing: Fen (Peat Bog), Indian Gardens administrative site.

Modifications to the AOI may be implemented at any time throughout the grazing season in response to resource or unforeseen environmental conditions including but not limited to: water availability, forage conditions, drought, fire, and management objectives. These include using monitoring results to continually modify management in order to achieve desired conditions and to provide the flexibility to adapt management to current conditions. Such changes may include annual administrative decisions to adjust the number of livestock, dates for grazing (season of use), class of animal, or pasture rotation. These changes would not exceed the limits for timing, intensity, duration, and frequency as defined in the grazing permit.

Some pastures will have grazing restrictions and include the following:

- The Fen (Peat Bog) in the Green Valley Allotment will continue to be excluded from grazing completely in order to protect this site.
- The Round Valley pasture will be closed to grazing for several years. Grazing will not commence until significant juniper removal and re-seeding projects have been separately analyzed, completed, and the range is restored.
- The riparian area of Tonto Creek in the Dick Williams pasture would only be grazed between the dates of October 1 and May 1, thus excluding livestock grazing from the riparian area from May 2 through September 30. Livestock may have access to the Dick Williams Pasture at any time; however, an existing fence paralleling the east portion of Tonto Creek as well as a pasture boundary fence on the west side of the creek will ensure livestock are excluded from a two mile stretch of Upper Tonto Creek in summer months. Livestock grazing during allowed timing will be within the normal limits of utilization for a riparian zone stated in the Forest Plan. The purpose of this timing restriction/exclusion is to minimize impacts to riparian vegetation, water quality, and recreation. The existing fence excluding this area would be maintained by the permittee prior to such use and would allow the permittee to use

Dick Williams pasture in months outside authorized dates for Tonto Creek. This management action will also lessen potential impacts to narrow-headed and northern Mexican gartersnake proposed critical habitat along the two mile reach of Tonto Creek. An existing livestock enclosure will be maintained around Horton Springs (approximately five acres in size) to mitigate concerns regarding cattle impacts to campers and riparian areas. Within this enclosure, the spring may be protected by double fence to keep elk out of the spring itself. The fence will be maintained by the Forest.

- The Indian Gardens Administrative site, which is 45 acres in size, will remain a Forest Service administrative site to be used by the Forest. Livestock will not have access to this site in order to preserve the forage resource for Forest Service livestock. The fence will be maintained by the Forest.
- An existing enclosure would be maintained around the Shoofly Ruins by the Forest to protect the heritage site from additional grazing impacts.
- Weeping lovegrass may be managed with specific guidelines and utilization standards that would take into account the effects of intensive management of this species on all resource values (i.e. wildlife, forestry, soils, hydrology, fire, recreation).
- A monitoring plan would be maintained as part of the Allotment Management Plan.

Adaptive Management

Adaptive management uses monitoring results to determine whether identified improvements are necessary or need to be modified. If monitoring indicates that desired resource conditions are not being achieved in the desired time frame or areas for this allotment, there are tools or administrative actions that would be used to modify management. Such modifications or changes may include annual administrative decisions to adjust the specific number of livestock and/or AUMs, specific dates for grazing, class of animal, or pasture rotations. These changes would not exceed limits for timing, intensity, duration, and frequency as defined in the term grazing permit. Adaptive management would be implemented through the AOIs, which would adjust livestock numbers and the timing of grazing so that use is consistent with current productivity and capacity and is meeting management objectives. Administrative actions that the Forest may take include the following:

- Extending or shortening time in a pasture based on utilization levels in uplands and riparian areas;
- Assessing the readiness of a pasture and changing its position in the rotation for the season;
- Changing timing or season of pasture use;
- Resting a pasture for one or more growing seasons;
- Implementing high intensity, short duration, or other grazing system;
- In the event of extended drought, severe fire, or depleted rangelands, completely removing livestock until rangelands have recovered;
- Decreasing or increasing herd size within the limits of the permitted numbers;
- Temporarily closing off water in a portion of a pasture to manipulate grazing pressure and intensity of use;
- Using salt and mineral blocks to aid in distribution, especially away from critical areas such as riparian areas;

- Excluding livestock from specific areas temporarily or permanently for other resource objectives;
- Changing or limiting season of use to minimize impacts to riparian vegetation and water quality.

Improvements

Existing range improvements are shown in Figure 1. Proposed improvements include cleaning existing earthen livestock tanks, creating new earthen livestock tanks or placing new above ground drinkers, routine maintenance of existing fencing or above ground drinkers, and constructing new livestock fencing. Range improvements like tank cleaning, creating new tanks, or installing partial fencing can reduce undesirable effects of grazing to riparian habitat, protect and enhance wildlife habitat, improve the rangeland resource, and improve livestock distribution.

There are no site-specific locations for creating new water developments. Conservation measures (see Conservation Measures under the Proposed Action section) will be followed when conducting routine maintenance of existing tanks or fences, and constructing new water sites or fences to minimize impacts to threatened and endangered and Forest Service sensitive species. All improvements would be constructed to Forest Service standards (FSH 2209.22 – Structural Range Improvement Handbook) and inspected for approval by Forest Service personnel, with appropriate permit modifications.

Monitoring

Effectiveness Monitoring

Effectiveness monitoring includes measurements to track conditions and trends of upland and riparian vegetation, soil, and watersheds. Examples of effectiveness monitoring indicators include, but are not limited to, pace transects, pace quadrat frequency, dry weight rank, ground cover, Parker 3-step, repeat photography, and Common Non-forested Vegetation Sampling Procedures, which measure frequency, cover, species composition, production, and utilization. Monitoring would occur at established permanent monitoring points. Both qualitative and quantitative monitoring methods would be used in accordance with the Forest's Interagency Technical References, Region 3 Rangeland Analysis and Management Training Guide, and the Region 3 Allotment Analysis Guide. These data are interpreted to determine if management is achieving desired resource conditions, if changes in resource condition are related to management, and to determine if modifications in management are necessary. Effectiveness monitoring will occur at least once over the 10-year term of the grazing permit or more frequently, if deemed necessary.

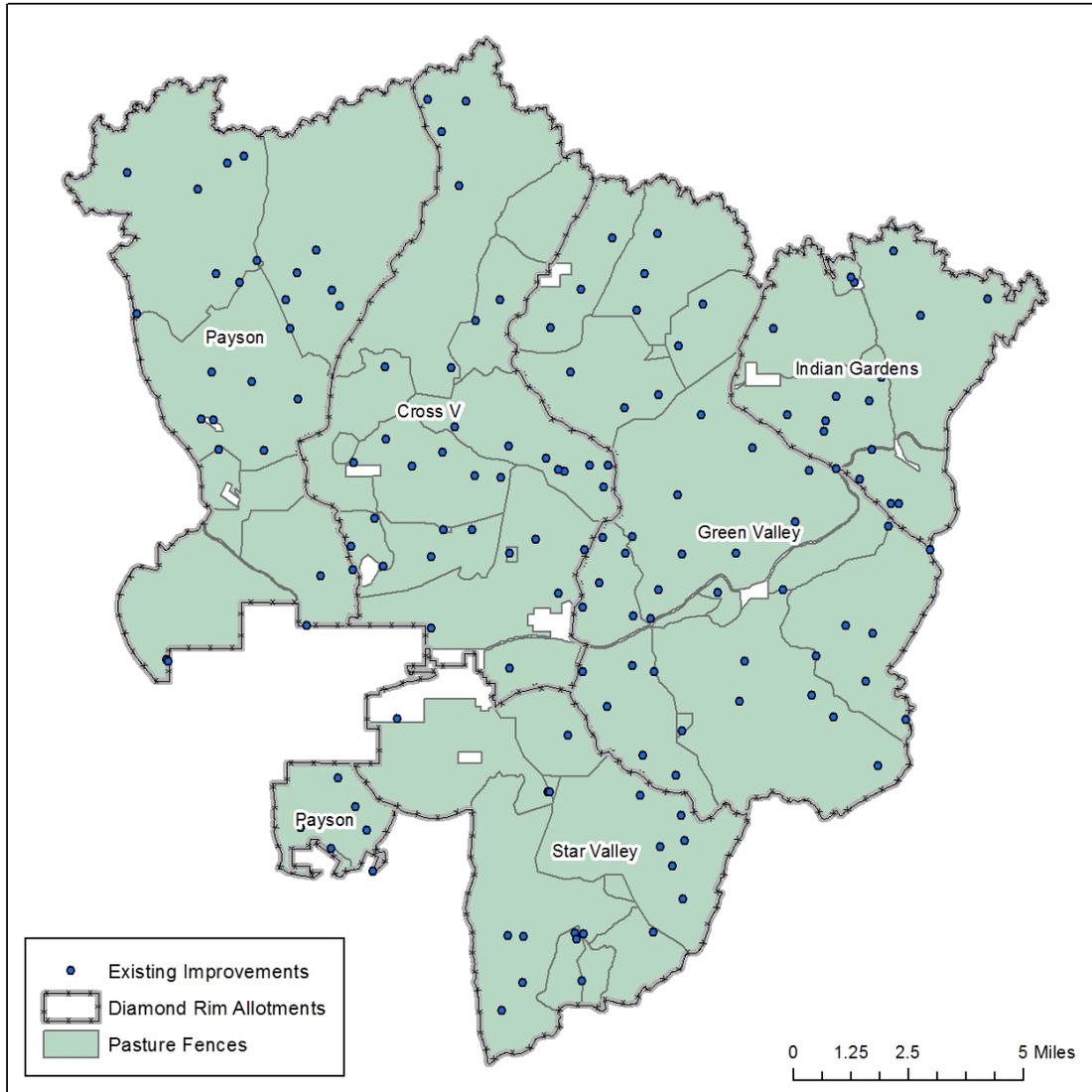


Figure 1. Existing Range Improvements on Diamond Rim Grazing Allotments.

Implementation Monitoring

Implementation monitoring will occur yearly and would include such things as inspection reports, forage utilization measurements in key areas, livestock counts, and facilities inspections. Utilization measurements are made following procedures found in the Interagency Technical Reference and with consideration of the Principles of Obtaining and Interpreting Utilization Data on Southwest Rangelands, or the most current acceptable method. The purpose of implementation monitoring is to determine if grazing meets conservative use guidelines in upland and riparian areas.

Utilization would be monitored on key forage species, which are native perennial grasses or browse species that are palatable to livestock. At a minimum, monitoring would include use in key areas, but may include monitoring outside of key areas. The Forest, in partnership with the permittee and other organizations, will be responsible for monitoring livestock grazing

utilization. Over time, changes in resource conditions or management may result in changes in livestock use patterns. As livestock use patterns change, new key areas may be established and existing key areas may be modified or abandoned in cooperation with the permittee.

Compliance monitoring is a form of implementation monitoring that documents whether or not livestock are distributed in correct pastures and areas authorized for grazing. Inspections and compliance monitoring visits to an allotment will be coordinated with the permittee. Information would be collected through routine pasture inspections and end of season utilization monitoring. Specific schedules for monitoring would be flexible from year to year based upon resource needs, which could change with climatic variations and management changes. Monitoring for plant cover, vigor, recruitment, and diversity, using techniques described in aforementioned publications, would ensure that wildlife needs and riparian and watershed conditions were moving toward desired conditions.

Monitoring methods could include, but are not limited to, utilization and stubble height monitoring, annual riparian monitoring, and photo point protocols. Data would be used, along with supporting information, to determine when livestock must be moved from one pasture to another and to make any necessary adjustments to livestock numbers and/or season of use as determined in the AOI.

Key areas

Key areas are described in “sampling vegetation attributes” (TNF 2016) as indicator areas that are able to reflect what is happening on a larger area as a result of on-the-ground management actions. A key area should be an area representative of the range as a whole, an area where livestock use occurs, located within a single ecological site and plant community, and a minimum of 100 yards from fence lines, exclosures, roads, and trails. Key areas may be identified in the Allotment Management Plan.

While monitoring techniques as described above would be conducted in key areas, these would not be the sole locations for gathering information from the grazing allotment to make decisions about the timing, intensity, duration, or frequency of livestock grazing in a given grazing season. The overall condition of the allotment, and such things as distribution patterns or rangeland improvement condition, could be assessed at any given time to help make those decisions.

Riparian Utilization Monitoring

Riparian components in key reaches would be monitored using riparian utilization measurements (implementation monitoring) following methods in Sampling Vegetation Attributes and Utilization Studies and Residual Measurements (TNF 2016) or the most current acceptable method.

In addition, riparian utilization monitoring will be completed annually within the perennial reaches of the Diamond Rim Allotments to ensure that cattle grazing standards are not exceeded and stream channels and soil conditions remain stable or are improving. Further, the Forest will continue monitoring recreational impacts to the upper Tonto Creek watershed and cooperate with Arizona Division of Environmental Quality to reduce water quality impacts due to land use practices with Forest control.

In order to achieve Forest Plan Standards and Guidelines, the following use guidelines for riparian components are as follows:

- *obligate riparian tree species* – limit use to < 50 percent of terminal leaders (top 1/3 of plant) on palatable riparian tree species accessible to livestock (usually \leq 6 feet tall);
- *deergrass* – limit use to < 40 percent of plant species biomass;
- *emergent species* (rushes, sedges, cat-tails, horse-tails) – maintain six to eight inches of stubble height during the grazing period.

Utilization limits for herbaceous riparian vegetation are intended to do two things: 1) protect plant vigor and 2) provide physical protection of streambanks or the sediment on the greenline that could develop into a bank feature. Deergrass was selected as the key species to monitor because it is the most common obligate, riparian, native, perennial grass on the Forest. Additionally, deergrass exhibits a number of traits that make it an ideal stream-stabilizing plant. The above ground attributes of deergrass aid in preventing soil loss through decreasing flow velocity; they also trap sediment that aids in the rebuilding of stream banks. Furthermore, deergrass is a bunchgrass with an extensive root system that acts to stabilize streambanks (TNF 2016).

If utilization reaches limits of recommended allowable use, livestock would be moved from the critical area or pasture, considering time of year and extent of area involved. Actual use records in combination with utilization measurements will inform whether it may become necessary to minimize or remove access to riparian habitat, if grazing pressure becomes a limiting factor in the use of pastures.

Management Practices and Mitigation Measures

Range

Livestock management practices such as herding and salting are critical to achieve proper livestock distribution within each unit/pasture. The permittee would be required to furnish sufficient riders or herders for proper distribution, protection, and management of cattle on the allotment. Tonto National Forest Grazing Practices are as follows:

- Forest Plan Standards and Guidelines applicable to livestock grazing would be followed. Salt and/or supplements would be placed where forage is abundant and current grazing use levels are low. Salt and/or supplements would not be placed any closer than 0.25 mile from available water, recreation sites, or designated trails except where prior written approval had been obtained from the District Ranger.
- No salting would occur within or adjacent to identified heritage sites. Salt would be removed from pastures when cattle have left an area, and not placed within a pasture until the cattle arrive. Additionally, salt will not be placed in the same location(s) each year.
- When entering the next scheduled pasture, all livestock would be removed from the previous pasture within two weeks (dependent on terrain).
- Permittee would ensure that enough time is allowed to remove livestock to meet the pasture move date(s) and avoid unauthorized and excess use.
- Permittee would ensure all infrastructure is in functioning condition prior to entering the next scheduled pasture.

Riparian

The Forest proposes the following as riparian mitigation measures:

- Livestock would not be trailed through riparian areas.
- Salt and/or mineral supplements would be placed at least 0.25 mile from riparian areas.
- The current grazing management criterion incorporates riparian and upland utilization standards to promote healthy riparian areas and provide cover, shading, and reduce erosion. These include: 50% of current year's growth for upland browse species; 40% of plant species biomass and maintain 6-8 inches of stubble height on deer grass for riparian herbaceous species; 50% of leaders browsed on upper 1/3 of plants up to 6 feet tall for riparian woody species.
- Range improvements that may be necessary as a result of adaptive management to address sensitive species and their habitats (such as the Gila trout) could be implemented, such as off-channel watering systems or fencing.

Conservation Measures under the Proposed Action

- New watering developments (earthen stock tanks, above ground drinkers, troughs, etc.) would not be developed within 300 feet of perennial streams and would not be developed in any species' proposed or designated critical habitat, at any special status species occupied site or protected habitat, or constructed during sensitive breeding seasons.
- In the action area, livestock grazing or livestock management activities will occur within Mexican spotted owl protected activity centers (PACs) or northern goshawk post-fledging family areas (PFAs), but fence construction or maintenance utilizing mechanized equipment would not occur inside PACs and PFAs during each species' breeding season or within 1,000 feet of an active eagle nest (exceptions may occur on a case by case basis or where recent surveys indicate non-breeding or infer absence).
- New spring developments would be constructed with the spring box designed so that residual flow is left at spring head to prevent dewatering.
- New fencing would be constructed using a "wildlife friendly" design which includes upper three strands barbed wire, top wire not to exceed 42 inches and lowest strand of smooth wire set at 16-18 inches to allow wildlife to safely pass under.
- Permittees will notify Forest Range and Wildlife staff 60 days prior to the maintenance cleaning of any stock tank or drinker occupied by or within dispersal distance of a Chiricahua leopard frog occupied site.

Action Area

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR § 402.02). In delineating the action area, we evaluated the farthest reaching physical, chemical, and biotic effects of the action on the environment. For the purpose of this project, the action area is defined as the boundary of the Diamond Rim Allotments that includes the allotment boundaries of Cross V, Green Valley, Indian Gardens, Payson, and Star Valley (Figure 2). This area encompasses 163,752 acres on the Payson Ranger District.

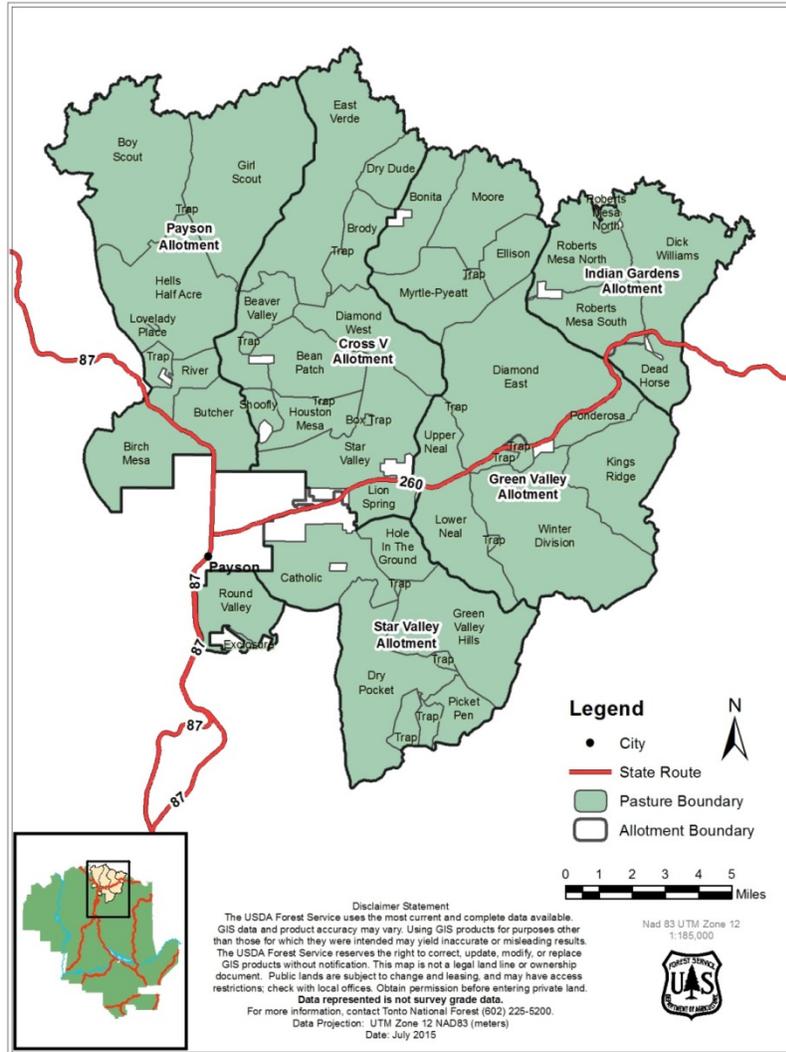


Figure 2. Map of Cross V, Green Valley, Indian Gardens, Payson and Star Valley Allotments and associated pastures that are referred to as the Diamond Rim Allotments.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY AND ADVERSE MODIFICATION DETERMINATIONS

Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this Biological Opinion relies on four components: (1) the *Status of the Species*, which evaluates the Chiricahua leopard frog’s range-wide condition, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the Chiricahua leopard frog in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the Chiricahua leopard frog; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the

effects of any interrelated or interdependent activities on the species; and (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the species' current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the species in the wild. The jeopardy analysis in this Biological Opinion considers the range-wide survival and recovery needs of the species and the role of the action area in its survival and recovery as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Adverse Modification Determination

This Biological Opinion relies on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02¹. In accordance with policy and regulation, the adverse modification analysis in this Biological Opinion relies on four components: 1) the *Status of Critical Habitat*, which evaluates the range-wide condition of designated critical habitat for the Chiricahua leopard frog in terms of physical and biological features², the factors responsible for that condition, and the intended value of the critical habitat for survival and recovery of the species; 2) the *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the value of the critical habitat for survival and recovery of the species in the action area; 3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the physical and biological features and how that will influence the value of affected critical habitat units for survival and recovery of the species; and 4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the physical and biological features and how that will influence the value of affected critical habitat units for survival and recovery of the species.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the species' critical habitat are evaluated in the context of the range-wide condition of the critical habitat, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would not preclude or significantly delay the current ability for the physical and biological features to be functionally established in areas of currently unsuitable but capable habitat) such that the value of critical habitat for the conservation of the species is not appreciably diminished.

¹ See 81 FR 7214.

² The term "primary constituent elements" was introduced in critical habitat designation regulations (50 CFR 424.12) to describe aspects of "physical or biological features", which are referenced in the statutory definition of critical habitat. The Services have removed the term "primary constituent elements" and returned to using the statutory term "physical or biological features" (81 FR 7414). Existing critical habitat designations will not be republished to reflect this change; however, in future rules we will discontinue using the term "primary constituent elements" and instead will use "physical and biological features".

STATUS OF THE SPECIES AND CRITICAL HABITAT

Chiricahua Leopard Frog

The Chiricahua leopard frog was listed as a threatened species without critical habitat in 2002 (USFWS 2002). Included was a special rule under Section 4(d) of the Act to exempt operation and maintenance of livestock tanks on non-Federal lands from the section 9 take prohibitions of the Act. The Ramsey Canyon leopard frog (*Lithobates subaquavocalis*) has been subsumed into *Lithobates chiricahuensis* (Crother 2008) and recognized by the FWS as part of the listed entity (USFWS 2009, USFWS 2012). As a result, the FWS reassessed the status of and threats to the currently described species *Lithobates chiricahuensis*, including the population previously described as the Ramsey Canyon leopard frog. A revised final rule was published on March 20, 2012 (77 FR 16324) that listed the species as threatened rangewide with designated critical habitat and included the special rule from the original listing. Final designation of critical habitat includes 39 areas in Arizona and New Mexico. A recovery plan for the species was finalized in 2007 (USFWS 2007).

The range of the Chiricahua leopard frog extends through the southeastern sections of Arizona and adjacent Sonora, Mexico, at elevations ranging from 1,219-4,023 feet, and from montane central Arizona east and south along the Mogollon Rim to montane parts of west-southwestern New Mexico, at elevations ranging from 3,500-8,040 feet. This species inhabits federal, tribal, and privately-owned land.

The species has been extirpated from about 80 percent of its historical localities in Arizona and New Mexico. The species is still extant in the major drainage basins in Arizona and New Mexico where it occurred historically; with the exception of the Little Colorado River drainage in Arizona and possibly the Yaqui drainage in New Mexico. However, it has not been found recently in many rivers within those major drainage basins, valleys, and mountains ranges, including the following in Arizona: White River, West Clear Creek, Tonto Creek, Verde River mainstem, San Francisco River, San Carlos River, upper San Pedro River mainstem, Santa Cruz River mainstem, Aravaipa Creek, Babocomari River mainstem, and Sonoita Creek mainstem. In southeastern Arizona, no records from 1995 to the present exist for the Pinaleno Mountains or Sulphur Springs Valley. As of 2009, there were 84 sites in Arizona at which Chiricahua leopard frogs occur or are likely to occur in the wild, with an additional four captive or partially captive refuge sites. At least 33 of the wild sites support breeding. In Mexico, 19 and 8 localities are known from Sonora and Chihuahua, respectively. The species' current status in Mexico is poorly understood; however, it has been found in recent years in western Chihuahua.

The primary habitat type for the Chiricahua leopard frog includes oak, mixed oak, and pine woodlands, although its habitat ranges into areas of chaparral, grassland, and desert, particularly for the southern populations. This species requires permanent water sources, including streams, rivers, backwaters, ponds, and stock tanks that are mostly free from introduced fish, crayfish, and bullfrogs. Natural aquatic systems include rocky streams with deep rock-bound pools, river overflow pools, oxbows, permanent springs, permanent pools in intermittent streams, and beaver dams. Human-influenced aquatic systems include earthen stock tanks, livestock drinkers,

irrigation sloughs, mine adits, abandoned swimming pools, and ornamental backyard pools (USFWS 2007).

Threats to this species include introduced bullfrogs, crayfish, and predatory fish, chytrid fungus (*Batrachochytridium dendrobatidis*), habitat fragmentation, major wetland manipulations, water pollution, and over-grazing. The most serious threats to the Chiricahua leopard frog include predation by nonnative organisms, especially American bullfrogs (*Lithobates catesbeianis*), spiny-rayed fishes, and crayfish (*Oronectes virilis*); and a fungal skin disease (chytridomycosis or “Bd”) that is killing frogs and toads around the globe. Today, invasive species such as introduced fishes, crayfish, and bullfrogs are one of the most important threats to the Chiricahua leopard frog on the local scale (USFWS 20012). The introduced crayfish is having major negative effects on native populations of frogs in North America (Kats and Ferrer 2003), probably contributing to the statewide decline of Chiricahua leopard frogs in Arizona (USFWS 2007). Bullfrogs are also important predators of native frogs, and recent eradication efforts in southern Arizona (Atascosa Mountains and Cienega Valley) appear to have established conditions that are favorable to the reestablishment of the Chiricahua leopard frog.

Chytridiomycosis and nonnative organisms, coupled with habitat fragmentation and loss resulting from water diversion, groundwater pumping, and pollution, have meant that recovery criteria outlined in the recovery plan have not been met for this species. Climate change and increases in UV radiation will likely impact this species in the future. Other threats include drought, floods, wildfires, degradation and destruction of habitat, water diversions and groundwater pumping, disruption of metapopulation dynamics (relationships among populations of frogs), increased chance of extirpation or extinction resulting from small numbers of populations and individuals, and environmental contamination.

The Chiricahua Leopard Frog Recovery Plan identifies eight recovery units in portions of Arizona, New Mexico, and Mexico. The Payson Ranger District, including the action area, is within Recovery Unit 5 (Mogollon Rim – Verde River Recovery Unit) (FWS 2007). Recovery Unit 5 has five management areas. These management areas have been assessed to have a high potential for reestablishing and managing for Chiricahua leopard frogs within the recovery unit. These management areas are West Mogollon Management Area, East Clear Management Area, Alder Creek-West Chevelon Canyon Management Area, Upper East Verde River Management Area, and Gentry Creek Management Area.

Recovery criteria to delist the Chiricahua leopard frog include:

1. At least two metapopulations located in different drainages, plus at least one isolated and robust population in each recovery unit;
2. Protection of these populations and metapopulations;
3. Connectivity and dispersal habitat protection; and
4. Threats and causes of decline have been reduced or eliminated, and commitments of long-term management are in place in each RU such that the Chiricahua leopard frog is unlikely to need protection under the ESA in the foreseeable future.

The total number of known sites occupied by Chiricahua leopard frogs in Arizona increased from 49 in 2002 to 90 in 2009 (USFWS 2011), although later reported as 84 occupied sites in 2009 (USFWS 2013). The Service has assessed Chiricahua leopard frog populations in Arizona as trending between “roughly stable” and “experiencing substantial increases” (USFWS 2011).

Critical Habitat

The 2012 Chiricahua leopard frog critical habitat rule designated 39 critical habitat units (approximately 10,346 acres) in the eight RUs within the range of the species in Arizona and New Mexico (USFWS 2012). The purpose of the designation of critical habitat is to conserve the physical or biological features that are essential to the conservation of the species and which may require special management consideration or protection. Based on our current knowledge of the physical or biological features and habitat characteristics required to sustain the species' life-history processes, we determined that the primary constituent elements (PCEs) specific to the Chiricahua leopard frog are:

1. Aquatic breeding habitat and immediately adjacent uplands exhibiting the following characteristics:

- a) Standing bodies of fresh water (with salinities less than 5 parts per thousand, pH greater than or equal to 5.6, and pollutants absent or minimally present), including natural and manmade (e.g., stock) ponds, slow-moving streams or pools within streams, off-channel pools, and other ephemeral or permanent water bodies that typically hold water or rarely dry for more than a month. During periods of drought, or less than average rainfall, these breeding sites may not hold water long enough for individuals to complete metamorphosis, but they would still be considered essential breeding habitat in non-drought years.
- b) Emergent and or submerged vegetation, root masses, undercut banks, fractured rock substrates, or some combination thereof, but emergent vegetation does not completely cover the surface of water bodies.
- c). Nonnative predators (e.g., crayfish (*Orconectes virilis*), American bullfrogs (*Lithobates catesbeiana*), nonnative predatory fishes) absent or occurring at levels that do not preclude presence of the Chiricahua leopard frog.
- d) Absence of chytridiomycosis, or if present, then environmental, physiological, and genetic conditions are such that allow persistence of Chiricahua leopard frogs.
- e) Upland areas that provide opportunities for foraging and basking that are immediately adjacent to or surrounding breeding aquatic and riparian habitat.

2. Dispersal and non-breeding habitat, consisting of areas with ephemeral (present for only a short time), intermittent, or perennial water that are generally not suitable for breeding, and associated upland or riparian habitat that provides corridors (overland movement or along wetted drainages) for frogs among breeding sites in a metapopulation with the following characteristics:

- a) Are not more than 1.0 mile overland, 3.0 miles along ephemeral or intermittent drainages, 5.0 miles along perennial drainages, or some combination thereof not to exceed 5.0 miles.
- b) In overland and non-wetted corridors, provides some vegetation cover or structural features (e.g., boulders, rocks, organic debris such as downed trees or logs, small

mammal burrows, or leaf litter) for shelter, forage, and protection from predators; in wetted corridors, provides some ephemeral, intermittent, or perennial aquatic habitat.

c) Are free of barriers that block movement by Chiricahua leopard frogs, including, but not limited to, urban, industrial, or agricultural development; reservoirs that are 50 acres or more in size and contain predatory nonnative fishes, bullfrogs, or crayfish; highways that do not include frog fencing and culverts; and walls, major dams, or other structures that physically block movement.

With the exception of impoundments, livestock tanks, and other constructed waters, critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries.

Special management needs for designated Chiricahua leopard frog critical habitat are expected in order to address the current and future threats and to maintain or restore the PCEs. Special management of aquatic breeding sites will be needed to ensure that these sites provide water quantity, quality, and permanence or near permanence; cover; and absence of extraordinary predation and disease that can affect population persistence. In dispersal habitat, special management will be needed to ensure frogs can move through those sites with reasonable success.

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 combined Payson, Cross V, Star Valley, Green Valley and Indian Gardens allotments, referred to as the Diamond Rim Allotments, consist of approximately 163,752 acres. The allotment complex is bounded on the north by the Mogollon Rim, to the west by AZ State Route 87, to the south by Round Valley Subdivision and Tonto Creek and to the east by the Christopher Mountain/Ellinwood grazing allotment. Elevations vary from about 3,200 feet in Tonto Creek to about 7,800 feet at the top of the Mogollon Rim.

The five allotments are located primarily within the Transition life zone (Lowe 1964). The primary vegetation types are pinyon-juniper/oak woodland, ponderosa pine, mixed-conifer, chaparral, and lovegrass (i.e. the Dude Fire burn area). Terrain varies from mesas and rolling slopes to the steep face of the Mogollon Rim, and steep canyons of Hell's Gate Wilderness. Precipitation ranges from about 12-18 inches in the Sonoran desert and semi-desert grassland vegetation type in the southern-most point of the complex to about 29-32 inches in the Mixed Conifer vegetation type along the Mogollon Rim to the north.

Status of the Chiricahua leopard frog and critical habitat within the action area

The action area is located in the Upper East Verde Management Area in Recovery Unit 5 outlined in the Chiricahua leopard frog Recovery Plan (USFWS 2007). Suitable habitat types within the Diamond Rim Allotments include stock tanks, springs, and streams; however, little data exist describing how many stock tanks or springs within the proposed area 1) are no longer functional, 2) are inhabited by nonnative aquatics like bullfrogs or barred salamanders, or 3) store amphibian diseases like chytrid fungus. Surveys reported 27 stock tanks and 21 springs in functional condition with presence of water during dry months of the year. Provided these sites do not have high densities of nonnative aquatic species, they could be considered suitable lentic sites for frogs. The approximate 46 miles of perennial or intermittent streams within the action area could also be considered suitable lotic sites provided they lack high densities of nonnative sport fish, crayfish, or bullfrogs. Unfortunately, all perennial stream miles within the action area contain some level of nonnative aquatics with the exception of Big Canyon, located on the eastern-most allotment, Indian Gardens. The presence of chytrid fungus has been known to occur within the project area. Although no stratigized sample efforts have taken place within the action area, in 2013, Arizona Game and Fish Department (AGFD) opportunistically collected 20 tissue samples from Chiricahua leopard frogs from four localities within the action area, two of which came back positive for chytrid (Lower Moore Tank and Cabin Draw).

Information from Chiricahua leopard frog protocol surveys were collected through July 2016 by permitted biologists from Payson Ranger District, AGFD, and Phoenix Zoo. According to the data, three of five Diamond Rim Allotments are currently occupied by Chiricahua leopard frogs: Cross V, Green Valley, and Indian Gardens; suitable habitat can likely be found in the Star Valley and Payson allotments. Since 1995, Chiricahua leopard frogs have been observed one time or another at 19 sites across these three allotments (22410-99-F-0300-R1, 22410-2008-F-0498) (Figure 3); however, frogs were observed at only ten sites in 2015 and two sites in 2016. Lack of surface water availability in occupied stock tanks and disease may be the causes for the local decline, in addition to the presence of nonnatives like bullfrogs, barred tiger salamanders, and crayfish.

The permittee for the Diamond Rim Grazing Allotment has collaborated with the Forest Service, AGFD, and others in helping to implement Chiricahua leopard frog recovery actions. They have participated in Chiricahua leopard frog recovery meetings, survey/status trainings, Chiricahua leopard frog introductions, and have installed improvements to minimize effects of cattle grazing to Chiricahua leopard frog as result of FWS section 7 consultations with the Forest Service. Specific efforts included constructing and maintaining fencing to protect Ellison and Lewis Creek frog habitat from cattle and elk impacts. They have also assisted AGFD in placing log jams in unfenced riparian areas to reduce livestock impacts to riparian habitat and also created stock tanks that have become colonized by Chiricahua leopard frogs and used as Chiricahua leopard frog release sites.

Cross V Allotment

Pieper Hatchery Spring and Borrow Pit Tank are two Chiricahua leopard frog populations within this allotment resulting from headstarting activities by the AGFD and Phoenix Zoo from 2010 to 2014. Pieper Hatchery Spring is a small but stable site where breeding is reliably documented

most years and frogs were detected in 2016. Conversely, Borrow Pit Tank (known by AGFD as “Bonita Tank”) received 130 juvenile frogs in July 2014, and frogs were only reported in extremely low numbers during the 2015 surveys; despite surveys in 2016, no observations were reported.

Green Valley Allotment

Since 1995, a total of 14 Chiricahua leopard frog populations have been known to inhabit stock tanks and drainages within this allotment. In the mid 1990’s, Ellison Creek was considered the last occupied Chiricahua leopard frog site in the Upper East Verde Management Area, and frogs were thought to be locally extirpated by 1999. In 2006, low numbers of Chiricahua leopard frogs were re-discovered in Ellison Creek and a tributary to Ellison Creek known as “Trib 4”; however, frogs were not observed in Ellison Creek after 2006. From 2009 through 2014 the AGFD and Phoenix Zoo released 1,588 tadpoles, 1,839 juveniles, and 6 adult Chiricahua leopard frogs across five drainages and five stock tanks within the allotment. A total of six sites were occupied in 2015 and two in 2016.

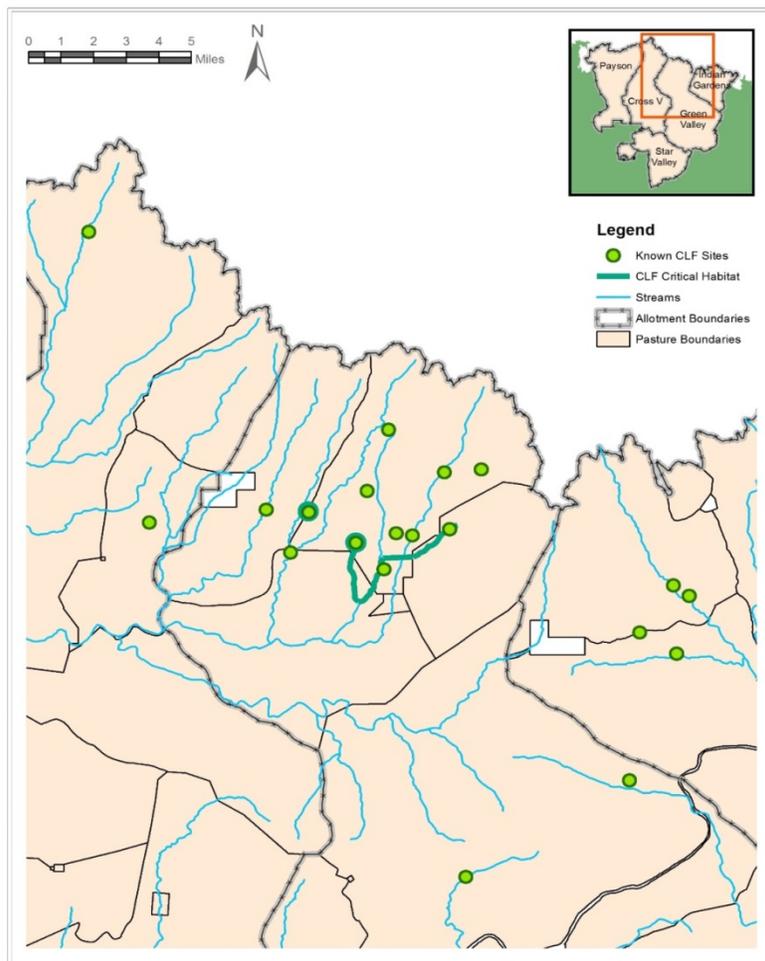


Figure 1. Nineteen known localities of Chiricahua leopard frog populations detected since 1995 on the Cross V, Green Valley, and Indian Gardens Allotments (copied from the BA).

Indian Gardens Allotment

Currently, there are four known Chiricahua leopard frog sites within this allotment resulting from headstarting activities by the AGFD and Phoenix Zoo from 2010-2011 and 2014. Post monitoring surveys from 2010-2015 have resulted in only low numbers of frogs observed (<8) across all four sites. A total of two sites were occupied in 2015 and only one site in 2016.

Additional information from 2008 and earlier describing the status of the species and actions affecting the species and its habitat within the Diamond Rim Allotments (formerly Little Green Valley allotments) can be found in our 2004 and 2008 biological opinions (22410-99-F-0300-R1, 22410-2008-F-0498).

Critical habitat

The Ellison and Lewis Creek Critical Habitat Unit occurs within the action area. This unit includes 83 acres of Tonto National Forest land and 15 acres of privately owned land; it is considered essential to the conservation of the species because it contains important breeding habitat needed for the species' recovery. Included in this unit are potential breeding sites at Moore Saddle Tank #2, Ellison Creek just east of Pyle Ranch, Lewis Creek downstream of Pyle Ranch, and Low Tank. Intervening drainages that provide connectivity among the latter three sites are also designated as critical habitat and include: (1) unnamed tributary to Ellison Creek from its confluence with an unnamed drainage downstream to Ellison Creek (2) then directly west across the Ellison Creek floodplain and over a low saddle to Lewis Creek below Pyle Ranch; (3) then downstream in Lewis Creek to its confluence with an unnamed drainage; and (4) then upstream in that unnamed drainage to Low Tank.

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

Chiricahua Leopard Frog

Overview

Because cattle grazing and tank maintenance will occur in areas occupied by the Chiricahua leopard frog throughout the Diamond Rim Allotments (especially stock tanks within the Cross V, Green Valley, and Indian Gardens allotments), we think it is reasonably certain over the life of the project that cattle and tank maintenance will adversely impact Chiricahua leopard frogs, metamorphosing frogs, and/or eggs masses, and its designated critical habitat.

Direct and indirect effects

Because Chiricahua leopard frogs are most often found and breed in stock tanks (and to a lesser extent along streams) within the action area, and these areas are also used by cattle that require maintenance, we anticipate direct and indirect adverse impacts to frogs and their habitat.

Stock tanks and their management are important for Chiricahua leopard frogs because they can provide frog habitat without predators, but they are also sources of adverse effects due their use by cattle and need for maintenance. Nonnative species of fish, amphibians, and crayfish intentionally or unintentionally stocked into livestock tanks (Rosen *et al.* 2001) can predate upon Chiricahua leopard frogs, metamorphosing frogs, tadpoles, and egg masses. Stock tanks can also be intermediary “stepping stones” in the dispersal of nonnative species from larger source populations to new areas (Rosen *et al.* 2001). Stock tanks that receive heavy livestock use may become polluted to such a point they may become toxic to frogs. Dense bank and aquatic vegetation, important habitat for the Chiricahua leopard frog, can be trampled or overgrazed by cattle.

Alternatively, well-managed stock tanks provide important Chiricahua leopard frog habitat, especially when the tank remains devoid of nonnative species, provides adequate vegetative cover, and provides reliable water sources in periods of prolonged drought. Given these benefits of well-managed stock tanks, these stock tanks are an important component to Chiricahua leopard frog recovery and are expected, in the long-term, to contribute to Chiricahua leopard frog conservation on the Diamond Rim Allotments. Development of new, well-managed stock tanks has the potential of creating Chiricahua leopard frog habitat to help improve the species’ distribution and abundance.

The maintenance and cleaning of stock tanks and creation of new stock tanks can provide both benefits and adverse effects to Chiricahua leopard frogs. Stock tank creation generates habitat for frogs, and maintenance removes sediment build up and can eliminate harmful non-native predators. But the process of either draining and/or cleaning tanks via bulldozer, backhoe, or other heavy equipment can also reduce habitat temporally and/or impact frogs (USFWS 2007). Although tank maintenance typically occurs infrequently and when tanks are dry or nearly dry, Chiricahua leopard frogs have been detected in nearly dry tanks, taking refuge in the cracks of the mud three to eight inches from the surface (TNF 2016). As a result, it is reasonable to anticipate fatality, injury, or harassment (fleeing the tank) to Chiricahua leopard frogs from tank maintenance (USFWS 2007) due to the abundance of tanks across the action area, dynamic distribution of frogs, and difficulty in detecting frogs hiding in the mud underneath the surface.

Livestock management on the Diamond Rim Allotments is expected to allow suitable Chiricahua leopard frog habitat to persist as a result of distributing livestock across the entire grazing space and managing and regulating grazing on herbaceous plants species; however, we anticipate some adverse effects cannot be avoided. Fleischner (1994) found that “because livestock congregate in riparian ecosystems, which are among the most biologically rich habitats in arid and semiarid regions, the ecological costs of grazing are magnified at these sites.” Stromberg and Chew (2002) and Trimble and Mendel (1995) also discussed the propensity for livestock to remain within or adjacent to riparian communities. Trimble and Mendel (1995) stated that “cows, unlike sheep, appear to love water and spend an inordinate amount of time together lounging in streams

and ponds, especially in summer (surface-active season for reptiles and amphibians), sometimes going in and coming out several times in the course of a day.” These livestock behaviors can be expected to occur on the Diamond Rim Allotments, especially because they are located in the arid Southwest where periods of drought are expected. Adaptive management and on-the-ground monitoring proposed for this project are designed to minimize livestock congregations near waters.

The trampling of amphibian species (in all life stages) by livestock has been documented (see Bartelt 1998; Ross *et al.* 1999); however, with this proposed action, the most likely impact of trampling will be to Chiricahua leopard frog egg masses due to their static existence. In the past, the Tonto National Forest has taken measures to reduce the likelihood of trampling egg masses by limiting cattle access to pool habitat, using dead and downed trees and constructing exclosures around other oviposition sites (USFWS 2008). Exclosures at Ellison Creek (trib 4), Lewis Creek, and Lower Moore Tank have helped to limit cattle access, but do not occur at all the places where frogs, eggs, and cattle may occur together throughout the action area. Because Chiricahua leopard frog distribution is expected to be dynamic over time, it is reasonable to anticipate over the length of the 10-year proposed action that cattle will directly and indirectly impact all stages of Chiricahua leopard frogs and their reproduction through trampling, collision, injury, and similar disruptive actions.

Therefore, as a result of cattle access to stock tanks and streams and maintenance/creation of stock ponds where Chiricahua leopard frogs occur, breed, deposit eggs, and grow, we are reasonably certain that mortality/injury/predation of frogs (including egg masses, early-stage tadpoles, or dormant-season metamorphosed frogs) and alteration of frog behavior will occur at some rate over the length of the 10-year grazing permit. Additionally, we are reasonably certain that adverse effects to bankside and aquatic vegetation from cattle grazing in occupied habitat, causing loss of cover and altering frog behavior, will occur during the duration of the proposed action. We anticipate these direct and indirect effects could occur on any of the current or future habitat areas within the Diamond Rim Allotments.

While watershed effects such as increased siltation are often associated with livestock grazing of upland habitats, we are reasonably certain that monitoring, conservative use, and adaptive management proposed by the Tonto National Forest for the Diamond Rim Allotments will minimize any potential effects of upland grazing on occupied habitat in the area of reintroduction sites, and as a result, we think these effects will be insignificant.

Chiricahua Leopard Frog Critical habitat

Overview

Reduced duration in riparian areas, conservative use, monitoring, subsequent rest, fencing, and standard Forest practices are anticipated to minimize impacts to streams/ponds and vegetation and the existence of overall wetted areas where Chiricahua leopard frog critical habitat occurs. However, the chytridiomycosis fungus (Bd) has been detected at several sites within the action area since 2004, and there is a likelihood of cattle or other unexpected activity assisting in the spread of this fungus over the length of the proposed action

Effects to Critical Habitat

We do not anticipate that the proposed action will adversely affect the existence of standing bodies of fresh water, such as natural and manmade ponds, and slow moving streams (PCE 1a). The standards and guidelines within the Forest Service's *Wildlife, Fish, and Rare Plant Habitat Management - 2600 Manual* should ensure that areas (stock tanks) are not dewatered or impaired to the point that they cannot support frogs.

We do anticipate that cattle will be able to eat, trample, and affect emergent and submerged vegetation that Chiricahua leopard frogs rely upon for cover (PCE 1b). Cattle will be able to access this vegetation within critical habitat. However, portions of critical habitat, such as Lower Moore Tank, contain rocky banks that limit vegetation growth, and Lewis Creek contains fencing that limits cattle impacts to vegetation. Through some site-specific management features and implementation of conservation use and monitoring, the proposed action will minimize cattle impacts to streamside vegetation; however, we expect this impact will be measurable and result in an adverse effect to this PCE.

We anticipate that the Tonto National Forest, through collaboration with the permittee and AGFD, will limit the distribution and abundance of nonnative predators (PCE 1c). Education of Forest Service employees about sensitive Chiricahua leopard frog areas and development and distribution of maps helps to identify the importance of preventing inadvertent transfer of these exotic species. The Forest is also partnering with AGFD in removing nonnative bullfrogs within the action area. Additionally, there is no expectation of cattle transferring these species over long distances from one stream to another.

Because of the existence of the chytrid fungus (Bd) on the Diamond Rim allotments, there is a reasonable likelihood management of livestock grazing and cattle will contribute to its spread over these allotments. The Tonto National Forest and the permittee implement measures to reduce the likelihood and extent of this occurring, such as disinfecting equipment or preventing transfer of mud on shoes, or other means that could transfer the fungus. However, cattle have the ability to come in contact with chytrid fungus and may contribute to the spread of disease.

Cattle have the potential to impact upland foraging and basking areas surrounding breeding aquatic and riparian habitat (PCE 1e); however the regulation, management, and monitoring of grazing is expected to limit the impact. While cattle could impact vegetation important for foraging, some of those impacts could also generate open basking areas. We expect that the limitation, regulation, and monitoring of vegetation use will allow both foraging and basking areas to persist for frogs, and therefore the impact will be insignificant.

We anticipate that the dispersal and nonbreeding habitat associated with ephemeral, intermittent, or perennial water (PCE 2a) connecting Chiricahua leopard frog metapopulations will not be adversely affected by the proposed action. Through regulation, management, monitoring, and movement of cattle, the proposed action is not anticipated to change the presence of streams or stock tanks that can connect Chiricahua leopard frog populations. In general, range management actions are more likely to maintain the persistence of stock tanks and perennial waters throughout these allotments.

The proposed action of livestock grazing is not expected to alter structural features (boulders, rocks, debris, downed trees, etc.) or vegetative cover for dispersing Chiricahua leopard frogs (PCE 2b). Cattle would not be able to alter the presence of structural features important for frog cover and shelter. The regulation, monitoring, and movement of cattle are anticipated to allow the persistence of suitable vegetative cover. As a result, we expect that the impact of cattle grazing on vegetative cover and structural features used by dispersing Chiricahua leopard frogs will be insignificant.

The proposed cattle grazing will not create barriers that block movement of frogs such as urban, industrial developments or large reservoirs with nonnative predators (PCE 2c). There is no aspect of the proposed action that is expected to create barriers or large reservoirs.

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.

Future non-Federal actions within the action area that are reasonably certain to occur include urban growth and development (the allotment surrounds private land in the Payson community that will likely experience further development), recreation, road maintenance, fuels-reduction treatments, elk grazing, and other associated actions. These actions have the potential to reduce the amount and quality of habitat for the Chiricahua leopard frog, and contribute as cumulative effects to the proposed action. Anglers have moved fish, tiger salamanders, and crayfish among tanks and other aquatic sites to establish a fishery or a source of bait or, in some cases, bait is released at an aquatic site during angling. Water, salamanders, and perhaps fish and crayfish could all be carriers of chytrids. In addition to possibly introducing chytrids, such activities would also facilitate introduction on non-native predators detrimental to Chiricahua leopard frogs.

CONCLUSION

After reviewing the current status of the Chiricahua leopard frog and its designated critical habitat, the environmental baseline for the action area, the effects of the proposed authorization of livestock use on the Diamond Rim Grazing Allotments, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the Chiricahua leopard frog, and is not likely to destroy or adversely modify its designated critical habitat. We base this conclusion on the following:

- Chiricahua leopard frog populations have persisted along with cattle grazing at these allotments over the last decade; and cattle use of vegetation is regulated, managed, monitored, and rested to prevent overgrazing of vegetation adjacent to streams/ponds that can be used by Chiricahua leopard frogs.
- Chiricahua leopard frog populations throughout its range have expanded to over 80 occupied sites from the last summary. These populations are dynamic, and any small

decline resulting from the proposed action would be a small proportion of their overall rangewide condition.

- Stock tanks, an important component of livestock grazing operations, provide important habitat for Chiricahua leopard frogs and will be maintained and possibly developed.
- Livestock are excluded from key Chiricahua leopard frog habitats, including portions designated as critical habitat.
- The Forest Service, AGFD, and the permittee have collaborated and are expected to continue to collaborate toward Chiricahua leopard frog recovery, which includes attending recovery meetings to prioritize and organize recovery efforts, working to prevent/minimize the spread of nonnative predators and chytrids, maintaining stock tanks, and participating in possible future introductions.
- Critical habitat primary constituent elements associated with water and habitat will persist and will not be permanently altered under the proposed action due to regulated conservative to moderate grazing, management, monitoring, and rest.

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.

The measures described below are non-discretionary, and must be undertaken by the Forest so that they become binding conditions of any grant or permit issued to the permittee, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest has a continuing duty to regulate the activity covered by this incidental take statement. If the Forest (1) fails to assume and implement the terms and conditions or (2) fails to require the permittee to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement. [50 CFR § 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

We are reasonably certain that the proposed action will cause incidental take over the life of the project in any of the following impact scenarios:

1. Harassment, direct mortality, or injury from livestock trampling, moving, dislodging, smothering, or coming into contact with Chiricahua leopard frog adults, metamorphosed frogs, tadpoles, or egg masses.
2. Harassment and harm to individual Chiricahua leopard frogs and their productivity caused by livestock degradation to bankline and emergent vegetative cover and other forms of habitat alteration leading to increased pool sedimentation and decreased cover/shelter.
3. Harassment, direct mortality, or injury of Chiricahua leopard frog adults, metamorphosed frogs, tadpoles, or egg masses from maintenance of livestock tanks (e.g., dredging or silt removal, major repair of berms).
4. Harassment and direct mortality to Chiricahua leopard frog adults, metamorphosed frogs, tadpoles, or egg masses due to unintentional benefit to, or facilitation of, nonnative bullfrogs, fish, salamanders, or crayfish that immigrate to newly constructed livestock tanks from nearby populations, existing or introduced.

Chiricahua leopard frog metapopulations are expected to be dynamic due to natural events and/or management efforts. Discovery of new Chiricahua leopard frog populations, recolonizations of extirpated sites, extirpation of occupied sites, weather caused influences, introductions, etc. are all factors that can increase or decrease frog distribution and abundance. Therefore, we expect that over the life of this proposed action, sites where incidental take may occur and the impact of that incidental take will change across the allotments. Incidental take may occur to individuals; however populations may still persist and even increase. Or possibly, incidental take may occur when populations are depressed, causing more noticeable effects to a population. The above anticipated types of incidental take considers the dynamic nature of frog occupancy; thus, we do not believe reinitiation is needed whenever a new population of Chiricahua leopard frogs is found, or frogs in a particular livestock tank are periodically absent.

We anticipate incidental take of Chiricahua leopard frogs, egg masses, tadpoles, and metamorphosed frogs will be difficult to detect for the following reasons: (1) dead or impaired individuals or egg masses are difficult to find and losses may be masked by seasonal fluctuations in environmental conditions; (2) the status of the species could change over time through immigration, emigration, and loss or creation of habitat; and (3) frogs, metamorphosed frogs, tadpoles, and egg masses are small, well camouflaged, and occur in or under water of varying clarity. For these reasons, we will attribute take at the sub-population level (otherwise referred to as occupied sites).

Incidental take is considered to be exceeded if 1) there is any direct or suspected evidence that any of the four impact scenarios described above from cattle grazing and tank maintenance are

believed to have happened, and 2) the distribution and abundance of Chiricahua leopard frog populations on the Diamond Rim Allotments decline to the following extent. Occupancy of Chiricahua leopard frog sites has varied on the Diamond Rim Allotments. A total of 19 different sites have been occupied since 1995, across the Indian Garden, Cross V, and Green Valley allotments, many initiated from introductions. Based on the 2016 surveys, 4 sites were known to be occupied: 2 on the Green Valley Allotment, 1 on Cross V, and 1 on Indian Garden Allotment. Therefore, we consider incidental take will be exceeded if evidence of any of the scenarios is identified or suspected to have occurred and occupied Chiricahua leopard frog sites are reduced to occurring on only 1 of the 5 Diamond Rim Allotments over any consecutive 2-year period of time over the 10-year life span of this biological opinion.

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 or destruction or adverse modification of critical habitat for the reasons stated in the Conclusions section.

REASONABLE AND PRUDENT MEASURES (RPMs)

Chiricahua leopard frog

The following reasonable and prudent measures are necessary and appropriate to minimize take of Chiricahua leopard frogs:

1. Ensure the continued integrity of all pasture boundary or livestock enclosure fence lines when adjacent to areas known to be occupied by Chiricahua leopard frogs, and ensure that unscheduled livestock are removed as soon as reasonably possible.
2. Take appropriate actions to help prevent nonnative species such as sportfish, crayfish, or bullfrogs from becoming established in livestock water developments that occur in the allotment complex and reduce the likelihood of transferring chytrid fungus.
3. Conduct Chiricahua leopard frog surveys to determine the distribution of occupied frog sites across appropriate habitat on the Diamond Rim Grazing Allotments, with an emphasis on the Cross V, Indian Garden, and Green Valley allotments.
4. Conduct stock tank maintenance in a manner to reduce and minimize impacts to frogs.
5. The Forest Service shall monitor incidental take resulting from the proposed action and report to us the findings of that monitoring.

TERMS AND CONDITIONS (T&Cs)

In order to be exempt from the prohibitions of section 9 of the Act, the Forest Service 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

The following terms and conditions implement reasonable and prudent measure #1 (fence maintenance) for the Chiricahua leopard frog:

- 1.1 Immediately prior to pasture use, the Tonto National Forest shall inspect pasture boundary and livestock enclosure fence lines that are adjacent to areas known to be occupied by Chiricahua leopard frogs. Ensure that any fence repairs are completed prior to pasture use.
- 1.2 The Tonto National Forest shall ensure that any livestock that are observed in unscheduled areas associated Chiricahua leopard frog habitat are removed from those areas within 48 hours of their discovery. If fence repairs are needed, complete repairs in a timely manner in order to prevent immediate repeat incidents, and evaluate and implement appropriate long-term solutions to avoid future breaches.

The following terms and conditions implement reasonable and prudent measure #2 (minimize nonnative species and chytrid fungus) for the Chiricahua leopard frog:

- 2.1 The Tonto National Forest will continue implementing annual Chiricahua leopard frog surveys (see Term and Condition #3.1). As a part of those surveys the Forest will also evaluate the distribution, occurrence, and abundance of nonnative species, their risk to Chiricahua leopard frog populations, and appropriate management.
- 2.2 If nonnative species are detected in stock tanks within dispersal distance to occupied Chiricahua leopard frog sites or suitable habitat, the Tonto National Forest shall initiate a multi-stakeholder planning effort to remove the nonnative species from the stock tank as quickly as possible. If a complete drying of a stock tank is deemed as the most effective management tool to address the threat of nonnatives, the Forest may time this action so as to not place an unnecessary burden on the permittee. Chiricahua leopard frog dispersal distance is generally considered to be 1.0 mile overland, 3.0 miles along ephemeral or intermittent drainages, 5.0 miles along perennial drainages, or some combination thereof not to exceed 5.0 miles.
- 2.3 The Tonto National Forest shall be vigilant in tracking the literature on chytrid fungus in order to stay current on the best management practices to prevent or

minimize the spread and transfer of chytrid fungus between and within Diamond Rim Allotments and into the Diamond Rim Allotments.

- 2.4 The Tonto National Forest and the permittee shall implement measures to reduce the likelihood and extent of transferring chytrid fungus throughout the Diamond Rim Grazing Allotments. Tactics include but are not limited to tracking existing locations of chytrid fungus; educating forest staff, permittees, and visitors on chytrid fungus; and implementing strategies to prevent transfer such as disinfecting equipment or preventing transfer of mud on shoes.

The following terms and conditions implement reasonable and prudent measure #3 (frog surveys) for the Chiricahua leopard frog:

- 3.1 The Tonto National Forest shall continue to implement Chiricahua leopard frog surveys (with the approved survey protocol) throughout appropriate habitat on the Diamond Rim Allotments, as established following the 2008 biological opinion on the Little Green Valley Complex (22410-1999-F-0300-R2) (i.e. one-half of all stock tanks on alternating years). If a different strategy is appropriate, the Tonto National Forest will discuss with the FWS to seek mutual agreement and approval.

The following terms and conditions implement reasonable and prudent measure #4 (stock tank maintenance) for the Chiricahua leopard frog:

- 4.1 The Tonto National Forest will take measures to minimize effects of tank maintenance by using the protocol outlined in Appendix A of the recovery plan (USFWS 2007).

The following terms and conditions implement reasonable and prudent measure #5 (incidental take monitoring) for the Chiricahua leopard frog:

- 5.1 The Tonto National Forest shall monitor the project area and other areas that could be affected by the proposed action to ascertain take of Chiricahua leopard frogs, tadpoles, metamorphosed frogs, and egg masses and/or loss of its habitat that causes harm or harassment to the species. Because detections of incidental take are difficult with aquatic species, the Tonto National Forest will look for evidence based upon habitat conditions, occurrence/absence of frogs/tadpoles/metamorphosed frogs, etc. This monitoring may be accomplished while using the Chiricahua leopard frog survey protocol.
- 5.2 The Tonto National Forest shall discuss and explore with AGFD, FWS, and the permittee, the necessity and feasibility of implementing remote camera surveillance of occupied Chiricahua leopard frog tanks in order to document habitat changes overtime, respond to potential impacts to frog habitat as quickly as possible (i.e. fence breaches, drying, unscheduled use, vandalism, etc.), and reduce/minimize incidental take.

- 5.3 The Tonto National Forest shall notify (written correspondence, e-mail, or phone call) our office as soon as practicable of any observation of any pasture boundary or exclusion fence line failure or fence line disrepair that is adjacent to known occupied Chiricahua leopard frog habitat within the Diamond Rim Grazing Allotments; including information on the corrective actions that were implemented and when pursuant to the T&C and RPM items 1.a. and 1.b. above.
- 5.4 The Tonto National Forest shall notify (written correspondence, e-mail, or phone call) our office as soon as practicable after its observed occurrence of any observation of unscheduled livestock in Chiricahua leopard habitats within the Diamond Rim Grazing Allotments; what corrective actions were implemented and when, pursuant to the RPM 1 above.
- 5.5 The Tonto National Forest shall notify (written correspondence, e-mail, or phone call) our office as soon as practicable of the observed occurrence of chytrid fungus or the discovery of nonnative species in any newly constructed stock tank to provide for collaborative emergency planning and corrective action, as required in RPM 2 above.
- 5.6 The Tonto shall submit an annual summary report to our office by January 1 each year during project implementation. These reports shall briefly document, for the previous calendar year, the results of any monitoring efforts conducted, a summary of any situations (and their corrective actions), that pertain to above items, and the fence line inspection findings from the previous year. The report shall also make recommendations for modifying or refining these terms and conditions to enhance listed species protection.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of 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. The Tonto National Forest must immediately provide an explanation of the causes of the taking and review with the FWS 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, 4901 Paseo del Norte NE, Suite D, Albuquerque, NM 87113; 505-248-7889) 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. We recommend the Tonto National Forest implement guidelines for livestock pond use and maintenance. The “Recommended Measures to Enhance Success”, Part 2 “Actions Available for Leopard Frog Recovery” in Appendix A and “Livestock Grazing and Management” in Appendix I of the Recovery Plan provide guidance regarding minimizing effects of livestock grazing activities, including livestock pond use and maintenance, on the Chiricahua leopard frog.
2. We recommend the Tonto National Forest continue to enhance bankline and aquatic vegetation, and habitat complexity at sites with extant Chiricahua leopard frog populations, where needed.
3. We recommend the Tonto National Forest continue to collaborate with other stakeholders to eliminate nonnative predators at or near Chiricahua leopard frog populations that pose a threat to those populations, and/or prevent existing sites with suitable Chiricahua leopard frog habitat from becoming occupied by nonnative species.
4. We recommend the Tonto National Forest continue to collaborate in identifying, restoring, or creating as needed, and protecting currently unoccupied recovery sites in the Upper East Verde Management Area necessary to support viable populations and metapopulations of Chiricahua leopard frogs.
5. We recommend the Tonto National Forest continue to collaborate in establishing new, or re-establishing former, populations of Chiricahua leopard frogs at selected recovery sites.
6. We recommend the Tonto National Forest continue to collaborate in augmenting populations in the Upper East Verde Management Area, as needed, to increase persistence.
7. We recommend the Tonto National Forest continue to collaborate in monitoring extant Chiricahua leopard frog populations and habitats, and implementation of the recovery plan.
8. We recommend the Tonto National Forest continue to support research needed to support recovery actions and adaptive management.
9. We recommend the Tonto National Forest continue to encourage and develop support for the recovery efforts for the Chiricahua leopard frog in the Upper East Verde Management Area through collaborative public and private partnerships.

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 actions outlined in the 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.

Certain project activities may also affect species protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected under the Bald and Golden Eagle Protection Act (Eagle Act). The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the FWS. The Eagle Act prohibits anyone, without a FWS permit, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you think migratory birds and/or eagles will be affected by this project, we recommend seeking our Technical Assistance to identify available conservation measures that you may be able to incorporate into your project.

For more information regarding the MBTA and Eagle Act, please visit the following websites. More information on the MBTA and available permits can be retrieved from <http://www.fws.gov/migratorybirds> and <http://www.fws.gov/migratorybirds/mbpermits.html>. For information on protections for bald eagles, please refer to the FWS's National Bald Eagle Management Guidelines (72 FR 31156) and regulatory definition of the term "disturb" (72 FR 31132) published in the Federal Register on June 5, 2007 (<http://www.fws.gov/southwest/es/arizona/BaldEagle.htm>), as well at the Conservation Assessment and Strategy for the Bald Eagle in Arizona (<http://www.swbemc.org/>).

In keeping with our trust responsibilities to American Indian Tribes, we encourage you to continue to coordinate with the Bureau of Indian Affairs in the implementation of this consultation and, by copy of this biological opinion, are notifying the Tonto Apache and Hopi Tribes of its completion. We also encourage you to coordinate the review of this project with the AGFD.

We appreciate the Tonto National Forest's efforts to identify and minimize effects to listed species from this project. Please refer to the consultation number, 22410-2008-F-0498-R001 in future correspondence concerning this project. Should you require further assistance or if you have any questions, please contact Greg Beatty (602-242-0210) or Brenda Smith (928-556-2157).

Sincerely,

Steven L. Spangle
Field Supervisor

cc (electronic):

Fish and Wildlife Biologist, Fish and Wildlife Service, Tucson, AZ (attn: Scott Richardson, Jeff Servoss, Cat Crawford)

Fish and Wildlife Biologist, Fish and Wildlife Service, Flagstaff AZ (attn: Brenda Smith, Shaula Hedwall, Dave Smith)

Fish and Wildlife Biologist, Fish and Wildlife Service, Phoenix, AZ (attn.: Mary Richardson, Kathy Robertson, Ryan Gordon)

Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ

Regional Supervisor, Arizona Game and Fish Department, Mesa, AZ

Director, Environmental Programs, Bureau of Indian Affairs, Phoenix, AZ

Wally Davis Jr., Director, Cultural Resources, Tonto Apache Tribe, Payson, AZ

Leigh J. Kuwanwisiwma, Director, Cultural Resources, Hopi Tribe, Kykotsmovi, AZ

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Appendix A: Concurrences

This appendix contains our concurrences with your “may affect, not likely to adversely affect” determinations for the threatened Gila trout (*Oncorhynchus gilae g.*); the northern Mexican (*Thamnophis eques megalops*) and narrow-headed (*Thamnophis rufipunctatus*) gartersnakes and their proposed critical habitats; and the Mexican spotted owl (*Strix occidentalis lucida*) and its critical habitat.

Gila trout

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the Gila trout. We base this concurrence on the following:

- Because perennial stream locations along Dude Creek where Gila trout are found contain steep slopes and do not contain abundant herbaceous species sought by cattle, but rather less palatable plants such as scrub oak, we anticipate cattle presence along this occupied stretch of stream will be limited. In combination with the difficult terrain and lack of herbaceous forage, cattle presence along riparian areas will be short-term (about 1-2 months), regulated (50% of terminal leaders on top 1/3 of riparian woody plants < 6 feet tall; 30-40% of herbaceous plant biomass; maintaining 6-8 inch stubble height), monitored, and rested. Due to the expected reduced cattle presence along Dude Creek because of the rugged terrain and the short duration, regulation, and monitoring of cattle use within Gila trout habitat, and the low likelihood of cattle trampling and killing/injuring Gila trout or its eggs, direct effects from livestock grazing are unlikely, and therefore discountable.
- Gila trout may occur along Webber, Chase, and Tonto creeks as a result of future introductions within the period of time covered by this biological opinion. Cattle presence and use along these streams will be managed through short-duration presence (about 1-2 months), regulated use of vegetation (50% of terminal leaders on top 1/3 of riparian woody plants < 6 feet tall; 30-40% of herbaceous plant biomass; maintaining 6-8 inch stubble height), monitoring, and a year of rest following use. Due to the expected managed cattle presence and vegetation use along these three streams, we anticipate a low likelihood of cattle trampling and killing/injuring Gila trout or its eggs, and therefore direct effects from livestock grazing are unlikely, and therefore discountable.
- While cattle may occur along streambanks where Gila trout occur (Dude Creek) or may occur (Webber, Chase and Tonto creeks) in the future following introductions, cattle presence and impact will be managed, regulated, and monitored. Cattle presence and use along these streams will be managed through short-duration presence (about 1-2 months), regulated use of vegetation (50% of terminal leaders on top 1/3 of riparian woody plants < 6 feet tall; 30-40% of herbaceous plant biomass; maintaining 6-8 inch stubble height), monitoring, and a year of rest following use. Should unanticipated impacts to vegetation occur, fencing or off-channel watering are identified as methods to implement to prevent indirect effects. As a result, we anticipate that the management, regulation, rest, and monitoring implemented along these streams will cause any indirect impacts to Gila trout

habitat (stream function, sedimentation, etc.) from livestock grazing to be insignificant.

- We expect any routine fence or stock tank creation or maintenance will have no effect to Gila trout or its habitat. Livestock fencing is placed in the uplands (often to protect riparian areas and streams). Fence repair typically consists of replacing/tightening barbed wire and installing/replacing posts and using off-road vehicles, chainsaws, and mechanical equipment over 1-3 days. Creation or maintenance of water developments will be greater than 300 feet from perennial water. Because fence and stock tank creation/maintenance will occur outside of the stream channels where Gila trout occur, and because ground disturbance for fence post placement is minor, we do not expect any effects to Gila trout or its habitat from fence/stock tank building or maintenance.

Narrow-headed gartersnake and proposed critical habitat

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the narrow-headed gartersnake and proposed critical habitat. We base this concurrence on the following:

- We do not anticipate direct effects from short-term (about 1-2 months) and regulated cattle grazing (50% of terminal leaders on top 1/3 of riparian woody plants < 6 feet tall; 30-40% of herbaceous plant biomass; maintaining 6-8 inch stubble height) will adversely affect narrow-headed gartersnakes. Due to the expected rarity of narrow-headed gartersnakes, the short duration of cattle occurrence within gartersnake habitat, the subsequent year of rest following use, and the low likelihood of cattle trampling and killing/injuring snakes, direct effects from livestock grazing to narrow-headed gartersnakes are unlikely, and therefore discountable.
- Because of the limited duration of cattle grazing in riparian areas (about 1-2 months), regulated use of vegetation (50% of terminal leaders on top 1/3 of riparian woody plants < 6 feet tall; 30-40% of herbaceous plant biomass; maintaining 6-8 inch stubble height), monitoring, and rest, we anticipate changes to riparian woody and herbaceous vegetation and stream habitat from cattle grazing will be minimized. As a result, narrow-headed gartersnake habitat (vegetation, streams, water quality, prey, etc.) will persist for its life history needs (cover, shelter, food, etc.), and any indirect effects to narrow-headed gartersnakes will be insignificant.
- Because routine fence creation or maintenance will be placed in the uplands (often to protect riparian areas and streams) outside of primary narrow-headed gartersnake habitat, we anticipate impacts will be minimized. Fence repair typically consists of replacing/tightening barbed wire and installing/replacing posts and using off-road vehicles, chainsaws, and mechanical equipment over 1-3 days. Because fence creation/maintenance will occur outside of the stream channels and be of short duration; combined with narrow-headed gartersnake rarity, we expect any disturbance is unlikely and therefore the effect to narrow-headed gartersnakes will be insignificant. Similarly, due to minimal ground cover disturbance installing and repairing fence posts, we anticipate any impact to narrow-headed gartersnake habitat will be insignificant.

- Because of the expected rarity of narrow-headed gartersnakes and their preference for lotic systems with prey (fish), we do not anticipate tank maintenance or creation of water developments (>300 feet from perennial water) will impact individual snakes or their habitat. As a result any impact to narrow-headed gartersnake behavior or habitat is expected to be discountable.
- Because of the limited duration of cattle presence in riparian areas, regulated use of vegetation, rest, and monitoring, we anticipate streamflow, habitat, function, and substrate (PCE 1a) will not be noticeably affected. Stream sections containing rugged cobble/bedrock, discouraging their use by cattle, and cattle riparian presence/use will be limited to about 1-2 months followed by a full growing season of rest. Combined with opportunities for winter dormant season grazing; limitations on use of riparian woody plants (50% of terminal leaders on top 1/3 of plants < 6 feet tall) and herbaceous plant species (30-40% of plant biomass); maintaining 6-8 inch stubble height; and monitoring; we expect impacts to stream habitat including flow, function, substrate, sediment, or habitat (riffles, runs, etc.) will be insignificant.
- Because there is no anticipated water withdrawal from proposed critical habitat streams for cattle, cattle have access to adjacent stock tanks during drought conditions, and cattle use and duration is limited, regulated and monitored, we do not expect livestock grazing will noticeably alter stream flow or function, and as result anticipate the effect to proposed narrow-headed gartersnake PCE 1b (natural stream flow regime and function) will be insignificant.
- Because of the regulated and limited cattle presence in riparian areas, we anticipate shoreline inorganic and organic matter (proposed narrow-headed gartersnake critical habitat PCE 1c) will not be noticeably affected. We do not anticipate cattle being able to alter the abundance of organic and inorganic streamside boulders, rocks, downed trees or logs, debris jams. Because of the limited approximate 1-2 month duration of cattle presence along critical habitat reaches (including exclusion of two miles), monitoring, and regulated use of herbaceous material with stubble height standards, we anticipate the impacts to herbaceous vegetation, leaf litter, and small mammal burrows will be minimized. As a result, we anticipate impacts to organic and inorganic matter will overall be insignificant due to the limited cattle presence and managed use of vegetation.
- Because proposed critical habitat is comprised of lotic sites with short duration (about 1-2 months) and regulated use by cattle, we do not expect livestock to pollute narrow-headed gartersnake habitat or native prey (proposed narrow-headed gartersnake critical habitat PCE 1d). Cattle use will be limited in duration within the proposed critical habitat (where only flowing streams occur, preventing concentration of pollutants), use will be regulated and monitored, and followed by a year of rest. Currently, the baseline presently consists of native salamanders, toads, frogs, and fish within proposed critical habitat. We anticipate that due to the regulated and limited use by cattle, combined with rest and flowing water, the impact of cattle on water quality will be insignificant.

- Because no anticipated infrastructure (buildings, etc.) associated with livestock grazing will occur within proposed narrow-headed gartersnake critical habitat, we do not expect adverse effects to terrestrial space within proposed narrow-headed gartersnake critical habitat (critical habitat PCE 2). Livestock grazing will not change or restrict the amount of open space adjacent to streams, nor will it alter the presence of existing features such as boulders, logs, trees, etc. Fencing will not prevent movement of narrow-headed gartersnakes. Creation of new stock tanks will not occur within proposed critical habitat boundaries. Growth of herbaceous and woody vegetation will be regulated by short duration, conservative use, opportunities for dormant season use, monitoring, and rest. We anticipate that because livestock grazing and its management will not alter the amount of open space, and its impact on herbaceous and woody vegetation will be minimized, that the overall impact to terrestrial space and structural characteristics will be insignificant.
- Because of managed and monitored livestock distribution, abundance, and use within riparian areas, we do not expect cattle will be able to noticeably influence the aquatic species distribution and abundance within proposed narrow-headed gartersnake critical habitat (PCE 3). The current prey base consists of a variety of native (chub, sucker, dace) and exotic fish species (trout, green sunfish, catfish). The limited, managed, and monitored use of livestock within proposed critical habitat (aquatic habitat and riparian areas) is not anticipated to alter the shoreline vegetation, sediment, or other stream habitat features to a degree that would noticeably alter aquatic prey species. As a result, we anticipate that livestock impacts to the abundance and distribution of narrow-headed gartersnake prey species will be insignificant.
- Because existing proposed narrow-headed gartersnake critical habitat streams within the action area have combinations of exotic and native fish species and cattle are not known transporters of living aquatic species between streams over long-distances, we do not expect livestock to impact species occurrence within any streams that do not have nonnative fish species (PCE 4), and therefore any effects are expected to be insignificant.

Northern Mexican gartersnake proposed critical habitat

We concur with your determination that the proposed action may affect, but is not likely to adversely affect northern Mexican gartersnake proposed critical habitat. We base this concurrence on the following:

- Because of the limited duration of cattle presence in riparian areas, regulated use of vegetation, monitoring, and a grazing exclusion along a two-mile stretch of Tonto Creek, we anticipate riparian habitat and stream function (proposed northern Mexican gartersnake critical habitat PCE 1 and 1a) will not be noticeably affected. By limiting cattle presence/use in riparian areas to 1-2 months followed by a full season of rest, combined with opportunities for winter dormant season grazing; limitations on use of riparian woody plants (50% of terminal leaders on top 1/3 of plants < 6 feet tall) and herbaceous species (30-40% of plant biomass); maintaining 6-8 inch stubble height; and

monitoring; we expect impacts to aquatic or riparian vegetation, including stream flow, function, or habitat (pools, backwaters, etc.) will be insignificant.

- Because only lotic habitats are included within proposed critical habitat in the action area, we do not anticipate impacts to lentic wetlands (proposed gartersnake critical habitat PCE 1b - tanks, springs, cienegas).
- Because of the regulated and limited cattle presence in riparian areas, we anticipate shoreline inorganic and organic matter (proposed northern Mexican gartersnake critical habitat PCE 1c) will not be noticeably affected. We do not anticipate cattle being able to alter the abundance of organic and inorganic streamside boulders, rocks, downed trees or logs, debris jams. Because of the approximate 1-2 month duration of cattle presence along critical habitat reaches (including exclusion of two miles), monitoring, and regulated use of herbaceous material with stubble height standards, we anticipate the impacts to herbaceous vegetation, leaf litter, and small mammal burrows will be minimized. As a result, we anticipate impacts to organic and inorganic matter will be insignificant due to the limited cattle presence and managed use of vegetation.
- Because proposed critical habitat is comprised of lotic sites with short duration (about 1-2 months) and regulated use by cattle, we do not expect livestock to pollute northern Mexican gartersnake habitat or native prey (proposed northern Mexican gartersnake critical habitat PCE 1d). Cattle will be limited in duration within the proposed critical habitat (where only flowing streams occur, preventing concentration of pollutants), use will be regulated and monitored, and followed by a year of rest. Currently, the baseline presently consists of native salamanders, toads, frogs, and fish within proposed critical habitat. We anticipate that due to the regulated and limited use of cattle, combined with rest and flowing water, the impact of cattle on water quality will be insignificant.
- Because no anticipated developments associated with livestock grazing will occur within proposed northern Mexican gartersnake critical habitat, we do not expect adverse effects to terrestrial space within its proposed critical habitat (critical habitat PCE 2). Livestock grazing will not change or restrict the amount of open space adjacent to streams, nor will it alter the presence of existing features such as boulders, logs, trees, etc. Fencing will not prevent movement of northern Mexican gartersnakes. Creation of new water developments will not occur within proposed critical habitat boundaries. Growth of herbaceous and woody vegetation will be regulated by short duration, conservative use, opportunities for dormant season use, monitoring, and rest. We anticipate that because livestock grazing will not alter the amount of open space, and its impact on herbaceous and woody vegetation will be minimized, that the impact to terrestrial space and structural characteristics will be insignificant.
- Because of managed and monitored livestock distribution, abundance, and use within riparian areas, we do not expect cattle will be able to noticeably influence the aquatic species distribution and abundance within proposed northern Mexican gartersnake critical habitat (PCE 3). The current prey base consists of a variety of native (chub, sucker, dace) and exotic fish species (trout, green sunfish, catfish). The limited, managed, and

monitored use of livestock within proposed critical habitat (aquatic habitat and riparian areas) is not anticipated to alter the shoreline vegetation, sediment, or other stream habitat features to a degree that would noticeably alter aquatic prey species. As a result, we anticipate that livestock impacts to the abundance and distribution of northern Mexican gartersnake prey species will be insignificant.

- Because existing proposed northern Mexican gartersnake critical habitat streams within the action area have combinations of exotic and native fish species and cattle are not known transporters of living aquatic species between streams over long-distances, we do not expect livestock to impact species occurrence within any streams that do not have nonnative fish species (PCE 4), and therefore any effects are expected to be insignificant.

Mexican spotted owl and designated critical habitat

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the Mexican spotted owl and designated critical habitat. We base this concurrence on the following:

- Because no human disturbance or livestock management activities/construction (such as fencing repair/creation or stock tank cleaning) will occur in Mexican spotted owl PACs (Protected Activity Centers) during the breeding season (unless non-nesting is confirmed) (March 1 to August 31) and no new water developments will be developed within PACs, we expect no disturbance to nesting Mexican spotted owls from livestock management activities. Alteration of Mexican spotted owl behavior outside of PACs during the breeding season or during the non-breeding season is expected to be of short duration or when the effects will not result in loss of productivity or survivorship. As a result, any direct impacts to Mexican spotted owl behavior that may occur during or outside of the breeding season from the proposed action are expected to be insignificant.
- The proposed action is not anticipated to adversely impact the key habitat components of Mexican spotted owl recovery habitat and critical habitat primary constituent elements (i.e. forest, forest structure, debris, riparian vegetation, prey species). Livestock grazing at conservative levels (utilization of herbaceous vegetation at 30 – 40%) is anticipated to meet this objective, and management activities will maintain the woody and herbaceous vegetation necessary for prey species habitat and the residual biomass that will support fire within the frequent fire-adapted forests on the allotment. Any stock tank development will not occur within Mexican spotted owl critical habitat. As a result, we expect the indirect effect of livestock grazing and management on Mexican spotted owl recovery and to designated critical habitat will be insignificant.
- Because livestock forage utilization will be maintained at moderate and conservative levels and grazing will occur through a rotational management system (either deferred or deferred, rest-rotation grazing), it will allow for plant growth and recovery. Grazing intensity on summer or winter range browse species would be managed up to moderate levels (30-50% utilization), while herbaceous utilization would be managed at conservative levels (30-40%). Management at these levels is anticipated to provide

sufficient herbaceous forage and hiding cover for owl prey and to maintain soil conditions and water quality. Potential owl foraging areas near Tonto Creek, Horton Spring, Ellison Creek (trib 4), and Lewis Creek will also be protected from potential livestock grazing effects due to maintaining existing exclosures. As a result, we anticipate implementing moderate and conservative use, maintaining existing closures in possible foraging habitat, and using deferred (or deferred rest-rotation) grazing will result in insignificant effects to Mexican spotted owl recovery and critical habitat.