



**Biological Assessment**  
**Hicks-Pikes Peak Allotment Grazing Authorization**  
**Project**

**Globe Ranger District, Tonto National Forest,**  
**Gila County, Arizona**

**April 27, 2020**



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## Introduction

The Globe Ranger District of the Tonto NF proposes to 1) continue to authorize livestock grazing on the Hicks-Pikes Peak grazing allotment, under, updated terms.

The purpose of this biological assessment (BA) is to review the proposed Hicks-Pikes Peak allotment management actions in sufficient detail to determine to what extent the actions may affect any threatened, endangered, or proposed species and their critical habitat (CH) present in the action area. Consultation coverage for the proposed action is for the life of the term grazing permit (10 years) or until new species listings within the project area require consultation. This BA is prepared in accordance with legal requirements set forth under Section 7 of the ESA (16 U.S.C. 1536) and follows the standards established in Forest Service Manual Direction (FSM 2672.4-2672.43).

## Definition of Action Area

A biological assessment action area includes all areas that will be affected directly or indirectly by the Federal action. For this analysis it includes the allotment boundary, and the Upper Salt River from the bridge crossing the river at State Hwy. Route 288 upstream to the allotment boundary where the river meets the eastern edge of the Ortega Pasture upstream from Cherry Creek. The action area includes the areas within the allotment boundaries, the Upper Salt River (river), its floodplain, and associated riparian habitats on both sides of the river; the total area is about 66,900 acres.

## Threatened, Endangered, and Proposed Species Considered

Species occurrence records from Tonto National Forest (Tonto NF), Arizona Game and Fish Department (AZGFD) and the U.S. Fish and Wildlife Service (USFWS) were used to identify listed species which may occur or have CH within the action area. Table 1 includes the species and/or CH that are considered present within the action area and analyzed in more detail within this document.

**Table 1: Species and Critical Habitat evaluated within the project action area.**

Common Name	Species	Status	Determination
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	ESA LE	May affect, not likely to adversely affect
Southwestern willow flycatcher CH	<i>Empidonax traillii extimus</i>	DCH	May affect, not likely to adversely affect
Yellow-billed cuckoo and Proposed CH	<i>Coccyzus americanus</i>	ESA LT, PCH	May affect, not likely to adversely affect
Narrow-headed garter snake and proposed CH	<i>Thamnophis rufipunctatus</i>	ESA LT, PCH	May affect, not likely to adversely affect
Razorback sucker CH	<i>Xyrauchen texanus</i>	ESA LE, DCH	May affect, not likely to adversely affect
ESA – Endangered Species Act; LE – Listed Endangered; DCH – Designated Critical Habitat; LT – Listed Threatened; PCH – Proposed Critical Habitat.			

## **Current management direction**

The permittee incorporates a rotational grazing strategy to allow rest on grazed plants. Grazing utilization and intensity are monitored during the grazing year. This is evaluated by estimating the amount of a grazed plant left intact, vigor of plants, precipitation, and growth stage of key species. There is a utilization limit, which was scientifically derived and concurred on in consultation with United States Fish and Wildlife Service, of 30 to 40 percent for upland grasses, 50 percent for desirable browse species, 50 percent for woody riparian species, and 30 percent for herbaceous riparian species. Livestock numbers have slowly increased, but averaged between 290 to 670, since 2006. This range falls within conservative estimates based on acreage and estimated forage production.

In 2018, a decision memo was signed which split the Ortega pasture into two pastures, East Ortega and West Ortega, by constructing a pasture division fence. Additionally, a drift fence was constructed on East Ortega pasture to keep livestock from accessing riparian habitat along the Salt River. These fences allowed grazing to resume in East Ortega pasture under the current grazing authorization, from September through December 2018.

## **Project Description and Location**

The Hicks-Pikes Peak Allotment is located on the Globe Ranger District, eight miles north and northwest of Globe, Arizona in Gila County (Figure 1). It encompasses a total area of 66,838 acres spread out over 21 pastures. Pastures range from over 10,000 acres to less than 500 acres. The Salt River forms part of the allotment's northern boundary, and Pinal Creek flows through the allotment from south to north. In total, there are 56 miles of creeks and washes flowing through Hicks-Pikes Peak. Topographical features range from nearly level valley and elevated plains to very steep mountains and escarpments. About 70 percent of the allotment is composed of nearly level to moderately steep slopes ranging from zero to 40 percent. Elevations range from about 2,200 feet to 6,600 feet. The mean annual precipitation at the nearby town of Globe is about 16 inches (elevation 3550 feet). The precipitation on the allotment, based on Terrestrial Ecosystems gradient analysis, ranges from approximately 13 inches at the lower elevations to 22 inches at the higher elevations.

A large part of this range is composed of decomposed granite soil, which is extremely susceptible to erosion. The vegetation communities in the allotment are primarily Sonoran Desert scrub in lower elevations (as low as 2,200 feet), semi-desert grasslands and chaparral in middle elevations, and pinyon-juniper-oak woodlands in high elevations (as high as 5,385 feet).

The proposed action consists of five components: authorization, range improvements, monitoring, response to monitoring, and livestock management practices and mitigations for other resources. The proposed action follows current guidance from Forest Service Handbook 2209.13, Chapter 90 (Grazing Permit Administration; Rangeland Management Decision making).

## **Authorization**

The Globe Ranger District of the Tonto National Forest proposes to continue to authorize livestock grazing on the Hicks-Pikes Peak Allotment under the following terms:

Proposed yearly maximum authorized use will vary between 650 to 800 adult cattle year-long. Adult cattle may include cows with calves, non-lactating cows, or bulls. Additionally, 700 to 1100 weaned calves up to 18 months of age (yearlings) would be authorized for up to any 7 months within a 12 month period. Yearlings can be any cattle that meet the above criteria, regardless if they are born on the allotment or purchased elsewhere. The proposed term grazing permitted number of cattle for the Hicks Pikes Peak Allotment is shown in Table 2.

**Table 2: Hicks Pikes Peak Allotment -- Proposed Term Grazing Livestock Numbers**

<b>Class of Livestock</b>	<b>Begin Date</b>	<b>End Date</b>	<b>Permitted Number of Livestock</b>
Adult cattle (cows with calves, non-lactating cows, or bulls)	March 1	February 28	800
Yearlings (cattle weaned calves and up to 18 months of age)	November 1	May 31	1100

Initial stocking levels would begin with currently authorized livestock numbers which are 326 adult cows grazed yearlong and 511 yearlings grazed for any 7 months within a 12 month period. As range improvements are installed, or as conditions on the allotment allow, authorized numbers may be increased up to the proposed maximum stocking numbers (refer to Table 2). Stocking adjustments would be planned and authorized by the Globe District Ranger, not to exceed the maximum permitted number of livestock. Factors affecting annual authorized livestock numbers may include precipitation, pasture rotation, forage production, current range conditions (i.e. forage and growing conditions), water availability, resource monitoring and permittee needs<sup>1</sup>.

The northern allotment boundary currently follows the Salt River from boundary with Sedow allotment and extends across the Salt River between Redmond Mountain and Pinal Creek, which partially makes up Lower Shute pasture. If cattle were to cross the Salt River during low flows, it would mean cattle may find access to neighboring allotments off the Globe Ranger District. Hicks-Pikes Peak livestock would not be authorized to cross the Salt River, onto other Forest Service administered lands, and a drift fence would be installed to keep cattle out of the Salt River. An existing fence would keep cattle from accessing Pinal Creek.

## Grazing System

Grazing will occur through a rotational system, either deferred or rest rotation grazing, which will allow plants the opportunity for growth or regrowth. Until necessary range improvements, such as fences and water developments, are installed on the allotment, grazing would continue under the current modified deferred grazing strategy. As new pastures are defined with new fences, and water developments are constructed, incorporating rest into each years' grazing plan will become possible. Adult cattle will be managed in three different herds and yearlings will be managed in a separate herd. Bulls may also be separated and run independently for part of the year.

Until fencing is established in each Unit, cattle would be rotated through three units, as described below. Reminder, the remaining portion of Lower Shute pasture that crosses the Salt River remains part of the allotment, but will not be actively grazed.

- **Ortega Unit:** One adult cattle herd would graze in North Horseshoe Bend, East Horseshoe Bend, Hope, East Ortega, and West Ortega pastures. West Ortega pasture would not be grazed until a drift fence is constructed to prevent livestock from accessing the Salt River (see proposed structural range improvement F2). Pastures may be grazed with up to 300 head of livestock.
  - West Ortega pasture will be grazed between August 1 and April 30 with up to 300 head of livestock. East Ortega pasture will be grazed between August 1 and April 30<sup>th</sup>.
  - When West Ortega pasture is constructed, this smaller pasture would allow rotational or deferred grazing, and the potential to split the herd.

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<sup>1</sup> More information can be found in the Monitoring and Response to Monitoring sections of this chapter.



- **Windmill Unit:** One adult cattle herd would graze in North Windmill, South Windmill, South Horseshoe Bend, West Horseshoe Bend, Upper Shute, East Lower Shute, West Lower Shute, and Redmond pastures. Both Lower Shute pastures would not be grazed until a drift fence is constructed to prevent livestock from accessing the Salt River (see proposed structural range improvement AF4). Pastures may be grazed with up to 250 head of livestock.
  - Windmill pasture will eventually be split into three pastures: North, South, and Main pastures.
  - Horseshoe Bend pasture will be split into East, West, North, South pastures.
  - Upper Shute will be split into two, with the other pasture named Redmond.
  - Lower Shute pasture would eventually be split into two pastures; East Lower Shute and West Lower Shute. Both Lower Shute pastures will be grazed between August 1<sup>st</sup> to April 30<sup>th</sup>.
  - As Lower Shute pasture is split, these smaller pastures would allow rotational or deferred grazing, and potential to split the herd.
  
- **Pikes Peak Unit:** Adult cattle herd would graze in Holly, Rip, Kenny, West, Lower Devore, Murphy, and Hicks pastures. Pastures may be grazed with up to 250 head of livestock.
  
- **Pinal Unit:** Up to 1,100 yearlings would graze in North Steer, South Steer, Upper Big, Yellow, Windmill, and Lower Big pastures. Bulls may be separated from the Hicks or Pikes Peak Unit and graze in the Pinal Unit as pastures are available.
  - Up to 1100 head of livestock would graze in the Pinal Unit from November through May 1. Grazing will occur between November and May 31 with up to 700 head of yearlings.
  - Bulls may be separated from other Units and placed in pastures, when available, but will not exceed 1100 head of livestock limit within this unit.
  - Livestock will not access Pinal Creek.

Annual operating instructions will specify pasture rotation schedules each year and include timing, livestock numbers, and duration. A rotation schedule will be developed with the permittee and incorporated into the allotment management plan to provide an estimate of grazing schedules. This schedule can be altered annually and authorized in the Annual Operating Instructions by the District Ranger.

### Vegetation Utilization

Grazing will be managed to achieve long-term goals in pasture key areas and ensure allowable vegetation use thresholds are not exceeded (Table 3).

**Table 3: Allowable Vegetation Use Thresholds**

Vegetation	Use Threshold
Upland herbaceous	30-40 percent of current year's growth
Upland browse	50 percent of current year's growth
Riparian herbaceous	Limited to 40 percent of plant species biomass and maintain 6 to 8 inches of stubble height of species like deergrass
Riparian woody	Limited to 50 percent of leaders browsed on upper one third of plants up to 6 feet tall

The Forest Plan limits use to 20 percent of tree and shrub annual production by volume. The percent of leaders browsed was chosen as a surrogate guideline in place of percent volume because volume is an extremely difficult parameter to assess on an annual basis. The method used for determining percent of leaders browsed is an expedient

and repeatable sampling technique. Mathematical relationships between the number of twigs browsed and the percent of current annual growth removed have been established in previous studies (Stickney 1966).

## Range Improvements

### Existing Structural Improvements

Existing range improvements on the Hicks Pikes Peak allotment are depicted along with proposed improvements in Figures 1 and 2. Maintenance of these improvements would be assigned to the grazing permit holder and will be maintained to standards in the Forest Service Structural Range Improvement Handbook (Forest Service Handbook 2209.22 R3). Additional maintenance standard details will be included in the Allotment Management Plan. Not all improvements were constructed or maintained to current standards. As improvements are reconstructed, they will be rebuilt to new standards (i.e. wire spacing). Existing improvements would not need to be modified until reconstruction is needed. Occasional off-system road travel to inspect or maintain these improvements would be authorized. Where no road exists to reach a specific improvement, a route has been designated for this use. Off-road vehicle use by the grazing permit holder is discussed further in the Livestock Management Practices and Mitigation for Other Resources section.

### Proposed Structural Improvements

Structural range improvements would be constructed in order to facilitate livestock distribution throughout the allotment and assist in achieving the desired conditions and management objectives set forth in this analysis.

It is not necessary for the proposed additional water developments to be completed in a specific order or timeframe. The following improvements are identified to be installed within the first two years following a decision on this project. These improvements would have heritage resource surveys completed before a decision is signed. (Table 4 and 2).

Table 4: Proposed Structural Range Improvements to be implemented within the First Two Years

Identifier	Description	Pasture
W2	An above ground water line running from existing Lower Mud Spring with approximately 1.5 miles of above ground water line with 1 trough, 1 storage tank and a corral.	Ortega
F2	Install a drift fence near the Salt River to provide a barrier to keep cattle from accessing the river.	West Ortega

### Additional Infrastructure

In addition to the structural range improvements listed above, additional infrastructure may be constructed, if needed, in the future. The effects of adding any additional infrastructure such as fencing or waters to achieve resource objectives in the future are disclosed in and tiered to this environmental analysis. No additional analysis for these improvements would be required, with the exception of appropriate Heritage clearances, if the improvements fall within the sideboards listed below. Heritage clearances for both the improvement and the access to the improvement would be obtained before implementation of any future improvements.

## Sideboards for Additional Infrastructure

Improvements may be authorized as necessary to achieve desired conditions without additional environmental analysis within the following specifications:

- All new range improvements within the Salt River Canyon Wilderness will be constructed beyond the flood plain of the Salt River.
- New range improvements in the Salt River Canyon Wilderness will be constructed with non-reflective materials.
- In areas with a visual quality objective (VQO) of preservation, or retention, new pipelines will be buried or placed out of sight of a casual forest observer where practicable.
- When traveling off road to range improvements outside of the Salt River Canyon Wilderness, the permittee will use a variety of routes, especially as they exit system roads, so as not to create new unauthorized routes that may be mistaken by other motorized users as authorized routes.
- Motor vehicle and or ATV/UTV access to range improvement sites would be on existing roads where practicable. Off-road vehicle use by pickup, trailer, ATV, UTV, or motorcycle needed to transport materials or machinery to maintain or inspect structural range improvements (fences, corrals, pipelines, wells, windmills, storage tanks, water delivery systems, troughs, earthen tanks) assigned in Part 3 of the term grazing permit as the permit holder's responsibility for maintenance is authorized. Existing routes or the shortest, most direct route to the improvement must be used and new route construction (i.e. blading a path) is not allowed without additional authorization. Cross-country motorized travel is not allowed when conditions are such that cross-country travel would cause unacceptable natural and/or heritage resource damage.
- Disturbance to obligate riparian vegetation should be minimized including but not limited to willows, cottonwoods, and sycamores.
- Spring developments would not dewater the spring and must maintain a residual flow for riparian obligate vegetation and wildlife species.
- Natural spring developments and their surrounding riparian vegetation are important winter stop over areas for Migratory Birds and provide important habitat for many riparian dependent species. Exclusion fences built in the vicinity of these areas should be built between at least one quarter and one half acres around the natural spring to maintain the riparian vegetation, where possible, and comply with Forest Service Policy (Forest Service Handbook 2526.03).
- District Ranger would authorize construction of any new range improvements through a permit modification.
- Existing improvements, as identified in Appendix D, may be maintained or removed from the allotment prior to installation of new improvements.

### **Improvements Design Features and Specifications**

All existing and new improvements will follow these design features. These design features are taken from the Forest Service Structural Range Improvement Handbook (Forest Service Handbook 2209.22 R3) or other Forest Service policy and Best Management Practices.

#### *Springs*

- All spring source facilities and headboxes should be adequately protected (i.e. buried or encased) or fenced. Headboxes will be constructed of concrete, metal, treated wood or other durable material. Initial pipeline, inside the box, should be fitted with a tee to prevent debris from entering the pipe.
- Horizontal wells must contain a shut off valve and reducer. Entire exterior of the well can be earth covered to prevent freezing.

### *Pipelines*

- Diameter of pipe should be large enough to carry the flow of the water development but not less than 1 inch.
- Inlet and outlet pipe are protected by anchoring to trough with a single post next to the vertical pipe and a brace or pole supporting the horizontal pipe. Inlet and outlet pipeline will be buried as much as possible for their protection.
- All above ground pipeline supported structures will be maintained to keep pipe at gradient and prevent sagging.
- Pipelines with air and drain valves will be covered with fine screen to prevent rodents and dirt from entering pipeline. Screens must be replaced as needed.
- Pipeline leaks will be repaired, or damaged section will be replaced with materials similar to materials from original construction.
- Pipelines with valve cover boxes will be kept covered and repaired when needed.

### *Troughs and Storage tanks*

- Troughs will be kept at heights that make them useable to livestock. Steel troughs should be kept off of the ground. Troughs which become elevated or uneven from trampling or erosion are periodically backfilled to maintain a useable height, authorization may be needed.
- Excess water in trough will be contained in an overflow pipe at least 50 feet away or nearest drainage. End of overflow pipe must be protected from trampling by livestock.
- New water developments will be constructed in uplands, at least 400 feet away from riparian areas, to encourage livestock use out of the bottoms.
- All existing or future water developments that have open tops (i.e. troughs, open top storage tanks) must have escape and access ramps (Forest Plan Page 42). All escape ramps will be built of expanded metal or similar materials and extend to bottom of trough and sides. Ramp will be firmly secured to trough rim so it will not be knocked loose by animals. Access ramps will be constructed of durable material such as concrete or metal. Slope will not exceed 45 degrees. Further design specifications may be required from “Water for Wildlife” by Taylor and Tuttle 2007.
- Where practical, leave water in troughs for wildlife when not in use by cattle.
- Troughs, storage tanks, and pipelines will be drained and cleaned periodically to prevent moss and debris buildup and damage from freezing.
- Poles, posts, and trough framing materials used in water development construction will be maintained, repaired, or replaced as needed.

### *Stock Tanks*

- Stock tanks will be kept clear of debris, floating logs, dead animals, etc. Spillways will be cleaned and maintained to prevent washing out or becoming plugged. Rodent damage and damaging vegetation on dams will be reported to Forest officer. Other specific requirements will be outlined through a letter.

### *Fences*

- All broken wire will be spliced and repaired and re-stretched to keep tension. Wire splices will be made with 12 gauge size tie wire or type of wire used in initial construction.
- Broken or rotted posts, braces or stays will be replaced where needed to maintain wire tension.
- Top wire on all range fences should be kept at 42 inches in height, and bottom wire should be smooth and 18 inches above ground. General maintenance will adhere to original construction, unless required by Forest Official. Reconstruction will be to these outlined standards.

### *Gates*

- Wire gate tension should be sufficient to prevent gate from sagging and still be opened and closed. Gate loops are made of smooth wire, not barbed wire.

### *Corrals*

- Broken or rotten sections of corrals will be replaced as needed to maintain useable condition.

## **General**

- All improvement components (e.g., rusted out troughs, broken sections of pipe, wire etc.) replaced during maintenance or reconstruction will be removed from Forest and properly disposed of.

## **Monitoring**

The objective of monitoring is to determine if management is being properly implemented and if the actions are effective at achieving or moving toward desired conditions.

Monitoring activities will be carried out by Forest Service staff either during or at the end of grazing season. Grazing permittee is encouraged to participate or conduct monitoring. Monitoring will consist of implementation and effectiveness monitoring in key areas such as: allotment inspections, noxious weed treatments, riparian monitoring, photo-points, utilization height and weight, reading the range, and parker three-step.

### **Implementation monitoring**

This type of short term monitoring determines whether standards and management practices, outlined in desired conditions, are currently implemented. For this type of monitoring to be successfully gathered, indicators will be collected at least yearly and include such things as inspection reports, forage utilization measurements in key areas, livestock counts, and facilities and improvements inspections. Monitoring would be collected in established key areas, but may also include monitoring outside of key areas.

### **Effectiveness monitoring**

Effectiveness monitoring tracks long-term condition and trend of upland and riparian vegetation, soil, and watersheds. Once data are analyzed, it will identify if management practices are effective toward meeting desired conditions. 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 measures; frequency, fetch, dry-weight rank, production, and utilization.

Monitoring would occur at established permanent monitoring points. Effectiveness monitoring should occur at least once over the ten-year term of the grazing authorization or more frequently, if deemed necessary.

### **Riparian Utilization Monitoring**

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 green line 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 Tonto NF. 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 which aids in the rebuilding of stream banks. Furthermore, deergrass is a bunchgrass with an extensive root system which acts to stabilize streambanks (Cornwall 1998; Clary and Kruse 2004).

Monitoring short-term indicators, such as stubble height and woody utilization, during the grazing season, can help determine if grazing use criteria is moving riparian conditions toward management objectives over time (Burton *et al.* 2011).

## Noxious Weed Monitoring

Noxious weeds located in these allotments will be treated as necessary. Permittee and Forest Service would coordinate weed inventory and treatment. Noxious weed monitoring will be carried out at the same time allotment inspections are conducted. As noxious weed populations are found they would be mapped, monitored, and treated. Treatment of invasive species may be carried out in accordance with practices established in Tonto's Environmental Assessment of Integrated Treatment of Noxious or Invasive Weeds as detailed in that decision notice and finding of no significant impact (Forest Service 2012).

## Key Areas

A key area is a portion of rangeland or riparian selected because of its representation of pasture, location, grazing or browsing value, or livestock use. It serves as a monitoring and evaluation point for range condition, trend, or degree of grazing use.

Key areas are further defined by seasonality of monitoring: short term or long term. Short term, or annual monitoring, identifies yearly adjustments to livestock grazing, climate, or other factors. Long term data, gathered on five to ten year intervals, measures change in plant community composition, cover, structure, soil conditions, frequency, and management of grazing through trend. Riparian long term data gathers vegetation and stream channel geomorphology condition and trend. These data are gathered on five to ten year intervals, preferably by riparian specialists.

A key area should be an area representative of the range or riparian areas as a whole, an area where livestock use occurs, located within a single ecological site and plant community, and be a minimum of 100 yards from fence lines, exclosures, roads, and trails. Key areas may be identified in the allotment management plan.

Key Areas for all types of monitoring will normally be one quarter mile from water, located on productive soils on level to intermediate slopes and be readily accessible to grazing. Within key areas, an appropriate key species is selected to monitor average allowable use (Forest Plan p. 42-1). Desired conditions contain measurable goals that will be measured at key areas. 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 and cooperators.

## Monitoring Direction

- Data collection procedures and interpretation would consider guidance contained in the *Principles of Obtaining and Interpreting Utilization Data on Southwest Rangelands* (Smith et al. 2007), Interagency Technical Reference 1734-3 "Utilization Studies and Residual Measurements" and "Sampling Vegetation Attributes" (1996) (Technical Guide) and the Forest Service Region 3 Rangeland Analysis and Management Training Guide (June 1997) (Training Guide), "Guide to Rangeland Monitoring and Assessment (Smith et al 2012).
- Guidance in monitoring techniques will follow accepted Forest Service protocols set by the monitoring handbook.
- Both qualitative and quantitative monitoring methods would be used in accordance with the Technical Guide and Training Guide.
- Utilization measurements are made following procedures found in the Technical Guide, or the most current acceptable method, and with consideration of the *Principles of Obtaining and Interpreting Utilization Data on Southwest Rangelands*. This document will also provide guidance for utilization data collection and interpretation.

- Key areas are described in “sampling vegetation attributes” (1996) as indicator areas that are able to reflect what is happening on a larger area as a result of on-the-ground management actions.
- Riparian components in key reaches would be monitored using riparian utilization measurements (implementation monitoring) following methods in the Technical Guide or the most current acceptable method.

## **Response to Monitoring**

Within the scope of the grazing authorization decision, the forest would adjust management in response to monitoring data, in combination with other factors such as weather patterns, likelihood of plant regrowth, and previous years’ utilization levels. Authorized number of livestock may be adjusted but would not exceed the number authorized in the grazing decision. The grazing decision and associated allotment management plan is implemented through the term grazing permit and annual operating instructions (AOI). Necessary annual adjustments to grazing management on the allotment will be implemented through the AOI, which will adjust use to be consistent with current vegetation productivity and resource conditions. The AOI may change season of use and pasture rest periods, and will also include mitigation measures and Best Management Practices<sup>2</sup> to avoid or minimize effects to wildlife, soil, and water quality. Modifications to the AOI may be implemented at any time throughout the grazing season in response to unforeseen environmental concerns such as drought, fire, flood, etc., or management and livestock operation concerns (see Appendix, Tables 15-19).

## **Livestock Management Practices and Mitigations for Other Resources**

### **Livestock Management**

For grazing throughout Tonto NF General and Salt River Wilderness Management Areas, practices to minimize impacts to other resources include:

- Permittee will furnish sufficient riders or herders for proper distribution, protection, and management of cattle on the allotment.
- Salt and mineral supplement will be used to distribute cattle. All supplements should not be placed any closer than one quarter mile from natural water sources, recreation sites, designated trails, and within or adjacent to identified/known heritage sites.
- Cattle should be drifted instead of trailed wherever possible. Do not trail through riparian areas as much as possible.
- When entering next scheduled pasture, all livestock shall be removed from previous pasture within two weeks of starting move unless otherwise approved.
- Permittee will monitor livestock utilization and move cattle when triggers are met.
- Permittee would ensure all infrastructures are in functioning condition, as described above, prior to entering the next scheduled pasture.
- Permittee may be asked to provide the Forest Service with Actual Use records and/or Improvement Maintenance records.

### **Drought Preparation**

Drought is inevitable in the desert Southwest. Regional Forest Service policy (R3 2219.1) sets a threshold of negative 1.00 SPI which triggers an evaluation of drought conditions. Once this is triggered, an interdisciplinary allotment evaluation is conducted to identify drought effects on an individual plant and landscape basis.

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<sup>2</sup> Additional information about additional Best Management Practices can be found in the Management Practices and Mitigation Measures section of this Proposed Action.

- Local precipitation data: rain gauge data, departures from normal;
- Current range management status: monitoring for desired conditions;
- Stocking levels: current authorized livestock numbers, grazing strategy;
- Available water sources: status of hauling water, stock tank levels, condition of improvements, and well or spring production.

When an allotment's 12 month SPI becomes positive, vegetation resources will be evaluated for indicators of drought recovery. Factors, such as the following, are evaluated:

- Recovery of vegetation: improved plant vigor, restoring litter production, restoring forage production;
- Implementation of grazing: focus on recovery through incremental restocking and pasture rest.

Early communication is important. Work with permittee to develop a drought preparedness guideline to be included in the Allotment Management Plan. These guidelines will help frame initial communications related to the first signs of management impacts due to drought. Guidelines should address potential drought impacts to livestock and vegetation, identify known issues, and strategically plan for different scenarios while actively monitoring.

#### Off-Road Travel

The following on-going activities requiring motor vehicle use off of designated routes would be authorized to conduct livestock grazing activities on National Forest System lands within the Tonto NF:

- Off-road vehicle use by pickup, trailer, ATV, UTV, or motorcycle needed to transport materials or machinery to maintain or inspect structural range improvements (fences, corrals, pipelines, wells, windmills, and storage tanks, water delivery systems, troughs, earthen tanks) assigned in Part 3 of the grazing permit as the permit holder's responsibility for maintenance would be authorized. Existing routes or the shortest, most direct route to the improvement must be used and route construction (i.e. blading a path) would not be allowed without additional authorization.
- Using an off-road vehicle to place supplements in strategic locations for livestock management purposes may be authorized by the District Ranger in the Annual Operating Instructions when requested.

Vehicle use to gather or move livestock off-road would not be authorized. Cross-country motorized travel would not be allowed when conditions are such that cross-country travel would cause unacceptable natural and/or heritage resource damage. Off-road use of heavy equipment (i.e. backhoe, dozer, loader, etc.) may be authorized for range improvement development as needed. Cross-country travel to construct new range improvements and other off-road travel by the permit holder will be analyzed in the environmental analysis for this project. Before new improvements are approved, Heritage clearance would be obtained, including the route to access the development.

No additional Section 106 cultural compliance is required for specific limited-use authorizations already covered by separate decisions under the *National Environmental Policy Act* per The Region 3 Region-wide Travel Management protocol with the Arizona State Historic Preservation Officer. Motor vehicle use in designated wilderness areas would continue to be managed consistent with the provisions of the Wilderness Act [Section 4(d)(4)(2)] that provides for limited exceptions for grazing livestock as further defined in the Congressional Guidelines (Forest Service Manual 2323.22).



## Wilderness

Management Area 2B emphasizes wilderness values. It provides for livestock grazing and recreation opportunities that are compatible with maintaining wilderness values and protecting resources. Section 4(c) of the *Wilderness Act of 1964* defines minimum requirements for administrative actions in wilderness areas, which includes grazing. Wilderness resources must be considered when preparing range improvement construction standards and techniques (Forest Service Manual 2323.26a).

Section 4(d)(4)(2) in Forest Service Manual 2320.5 states that "...wilderness designation should not prevent the maintenance of existing fences or other livestock management improvements, nor the construction and maintenance of new fences or improvements, which are consistent with allotment management plans and/or which are necessary for the protection of the range."

Compliance with the *Wilderness Act* in the Salt River Canyon Wilderness area is important and expected of all users on the allotments. The permittee should strive to maintain the untrammled, natural conditions within wilderness areas. No motorized equipment should be used in wilderness areas without obtaining authorization from the Regional Forester.

## Conservation Measures from the Environmental Assessment

- Ortega and Lower Shute pastures would not be grazed until a drift fence is constructed (see proposed structural range improvement F2).
- An existing fence would keep cattle from accessing Pinal Creek.
- Install a drift fence near the Salt River and Pinal Creek, within Lower Shute Springs pasture. A minimum tools analysis would be completed to authorize fence construction in designated wilderness areas (Improvements AF4).
- All new range improvements within the Salt River Canyon Wilderness will be constructed beyond the floodplain of the Upper Salt River.
- Grazing on the allotment will occur as outlined in Table 4 to limit grazing adjacent to nesting flycatchers during their breeding season and reduce potential for effects from brown-headed cowbird brood parasitism.

Until fencing is established in each Unit, adult cattle would be rotated through three units, as described on page 9.

**Table 4: Grazing season summary table for pastures adjacent to flycatcher habitats along the Upper Salt River and Pinal Creek in the Ortega, Windmill, and Pinal Units.**

Pasture/Unit	Proposed use season from Proposed Action	Estimated Livestock Numbers	Comments	Class
Ortega/Ortega	August 1 to April 30	Up to 300 head	Pasture proposed to be split into 2 pastures, E & W Ortega, no access to Salt River.	Adult
Lower Shutes/Windmill	August 1 to April 30	Up to 250 head	Pasture proposed to be split into 2 pastures, see improvement AF6, no access to Salt River	Adult
Pinal Unit	November to May 31 yearly	Up to 700 head	Livestock will not access Pinal Creek	Yearlings

- When traveling off road to range improvements outside of the Salt River Canyon Wilderness, the permittee will use a variety of routes, especially as they exit system roads, so as not to create new unauthorized routes that may be mistaken by other motorized users as authorized routes.
- Existing routes or the shortest, most direct route to the improvement must be used and new route construction (i.e. blading a path) is not allowed without additional authorization. Cross-country motorized travel is not allowed when conditions are such that cross-country travel would cause unacceptable natural and/or heritage resource damage.
- Disturbance to obligate riparian vegetation should be minimized including but not limited to willows, cottonwoods, and sycamores.
- Natural spring developments and their surrounding riparian vegetation are important winter stop over areas for Migratory Birds and provide important habitat for many riparian dependent species. Exclosure fences built in the vicinity of these areas should be built between at least one quarter and one half acres around the natural spring to maintain the riparian vegetation where possible and comply with Forest Service Policy (Forest Service Handbook 2526.03).

### Vegetation Utilization

Grazing will be managed to achieve long-term goals in pasture key areas and ensure allowable vegetation use thresholds are not exceeded.

- Permittee will monitor livestock utilization and move cattle when triggers are met.
- New water developments will be constructed in uplands, at least 400 feet away from riparian areas, to encourage livestock use out of the bottoms.
- Salt and mineral supplements will be used to distribute cattle. All supplements should not be placed any closer than one quarter mile from natural water sources, recreation sites, designated trails, and within or adjacent to identified/known heritage sites.
- Vehicle use to gather or move livestock off-road would not be authorized. Cross-country motorized travel would not be allowed when conditions are such that cross-country travel would cause unacceptable natural and/or heritage resource damage.

**Table 5: Allowable Vegetation Use Thresholds**

Vegetation	Use Threshold
Upland herbaceous	30-40 percent of current year's growth
Upland browse	50 percent of current year's growth
Riparian herbaceous	Limited to 40 percent of plant species biomass and maintain 6 to 8 inches of stubble height of species like deergrass
Riparian woody	Limited to 50 percent of leaders browsed on upper one third of plants up to 6 feet tall

## Conservation Measures

### Conservation Measures agreed to during the Biological Assessment process

- Provide annual education and information to permittee and ranching personnel about narrow-headed garter snakes including Species Identification, habitats, and instruction that they should never be intentionally killed.
- Grazing on the leased private land parcel at Horseshoe Bend will occur outside of the Salt River Floodplain and flood-prone area, and will not occur within the cowbird critical season (May 1 thru July 30).

## Species Accounts, Status of the Species in Action Area, Effects, Determination, and Rationales

### Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

ESA Status:	Endangered, March 29, 1995
Forest Occurrence:	Tonto, Apache-Sitgreaves, Coconino, Coronado, Gila, Prescott
Recovery Plan:	2003
Critical Habitat:	January 3, 2013

#### Status of the Species

The Southwestern willow flycatcher {herein after referred to as the flycatcher} is a Neotropical migrant that breeds in the southwestern U.S. and migrates to Mexico, Central America, and possibly northern South America during the non-breeding season (Phillips 1948, Stiles and Skutch 1989, Howell and Webb 1995). The historical breeding range of the flycatcher included Arizona, southern California, New Mexico, western Texas, southern Colorado, southern Utah, southern Nevada, and extreme northwestern Mexico (Sonora and Baja) (Unitt 1987). The current distribution of flycatcher breeding populations includes public, private, and Tribal lands in six of the seven States comprising its historical range (it has not been detected recently breeding in Texas) {USFWS 2014}.

The flycatcher was listed as endangered, without CH on February 27, 1995 (U.S. Fish and Wildlife Service {USFWS} 1995). Critical habitat was designated in 1997 and 2005, and a revision to the 2005 rule was proposed in August 2011 and the final rule was published in 2013 (USFWS 2013).

The historical breeding range of the flycatcher in Arizona included portions of all major watersheds (Unitt 1987). Post-1990 investigations show the flycatcher persists, probably in much reduced numbers, along the Salt and Verde Rivers, and Tonto Creek; and the Big Sandy, Bill Williams, Colorado, Gila, Hassayampa, Little Colorado, San Francisco, San Pedro, Santa Cruz, and Santa Maria River systems (AZGFD 2002, Cooper 1996, Durst 2008, Harris 1987, Hubbard 1987, Tibbitts and Johnson 1999).

The flycatcher is an insectivore that catches insects while flying, hovers to glean them from foliage, and occasionally captures insects on the ground. The flycatcher places its nest in relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands, including reservoirs). Most of these habitats are classified as forested wetlands or scrub-shrub wetlands. Across its range, the flycatcher has commonly placed nests in a variety of riparian trees and shrubs. While there are exceptions, generally flycatchers are not found nesting in areas without willows, tamarisk, or both (Finch 2000). Habitat requirements for wintering are not well known, but include brushy savanna edges, second growth, shrubby clearings and pastures, and woodlands near water. Evidence gathered during multi-year studies of color banded flycatchers shows that individuals typically have a high fidelity to the general area where they were hatched but can regularly move among different breeding sites in close proximity within and between years (Netter et al. 1998).

Flycatchers are believed to exist and interact as groups of metapopulations. A metapopulation is a group of geographically separate flycatcher breeding populations connected to each other by immigration and emigration. Flycatcher metapopulations are most stable where many connected sites or large populations exist (USFWS 2002, p. 72).

The flycatcher has experienced extensive loss and modification of breeding habitat, with consequent reductions in population levels. Destruction and modification of riparian habitats have been caused mainly by: reduction or elimination of surface and subsurface water due to diversion and groundwater pumping; changes in flood and fire regimes due to dams and stream channelization; clearing and controlling vegetation; livestock over-grazing; changes in water and soil chemistry due to disruption of natural hydrologic cycles; and increased fire risk due to the establishment of non-native plants. Concurrent with habitat loss have been increases in brood parasitism by the brown-headed cowbird (*Molothrus ater*), which can inhibit reproductive success and further reduce population levels (Mayfield 1977, Robinson et. Al. 1992, Schweitzer 1998, and Whitfield 1993, 1994, 1995) . According to USFWS, the known number of territories has been on the increase from 1998 to 2007; however, some of that increase is a result of increased survey effort. Most recently, the tamarisk leaf beetle has become an increasing and significant threat to flycatcher habitats and recovery (USFWS 2014).

## Recovery

The Southwestern Willow Flycatcher Recovery Plan was finalized in 2002. Recovery actions in the Plan are categorized into nine types: (1) increase and improve occupied, suitable, and potential breeding habitat; (2) increase metapopulation stability; (3) Improve demographic parameters; (4) minimize threats to wintering and migration habitat; (5) survey and monitor; (6) conduct research; (7) provide public education and outreach; (8) assure implementation of laws, policies, and agreements that benefit the Southwestern willow flycatcher and; (9) track recovery progress.

## Status of the Species within the Tonto National Forest

The Tonto NF has the largest number of known Southwestern willow flycatcher territories of all national forests in the Southwest Region of the Forest Service. Tonto NF is within the Gila Recovery Unit and primarily its Roosevelt and Verde Management Units. Flycatcher territories within the Roosevelt Management Unit have ranged between 6 and 209 from 1993 to 2006. In 2007, Tonto NF Surveys reported 81 territories within the Roosevelt Management Unit. Surveys continue at Roosevelt Lake and tributary streams, but are no longer comprehensive. They now occur at priority sites identified annually by the forest and cooperators, and may be either protocol or presence/absence surveys. Most territories occur in riparian areas surrounding Roosevelt Lake and streams tributary to the lake. Tributary streams where territories have been documented include Upper Salt River {herein after referred to as the river}, Cherry Creek, Pinal Creek, and Tonto Creek. Between zero and seven territories have been documented along Pinal Creek on private land adjacent to the Forest. Territories also occur on or near the forest within the Verde Management Unit along the Verde River where from 0-30 territories have been documented. Main detection sites along the Verde River include Inflows to Bartlett and Horseshoe Reservoirs, and Camp Verde.

The number of Flycatcher territories has fluctuated over time on the Tonto NF, in particular at Roosevelt Lake on the Tonto Basin Ranger District. The lowering and raising of the lake has helped to create, and has inundated, large amounts of flycatcher habitat. After the water storage of Roosevelt Lake dropped to a low of 10 percent of its capacity in 2002, the number of flycatcher territories within the Roosevelt Management Unit reached their highest numbers in 2004 (Ellis *et al.* 2008, pgs. 30-31). However, after the lake filled to about 96 percent capacity in 2005, flycatcher habitat became inundated within the conservation space of the lake and individuals began to establish territories along other nearby streams (Ellis *et al.* 2008, pgs. 30-31). Flycatchers were detected furthest upstream on Tonto Creek (near the Town of Gisela) and on Rye Creek at its confluence (flowing together) with Tonto Creek (A. Madara, Tonto NF, pers. comm.). Similarly, on the Salt River, some territories (< 10) were discovered farther upstream at Chalk Creek, Coon Creek, and Redmond Flat, and Horseshoe Bend, and at Gleason Flats (A. Madera, Tonto NF, pers. comm.). Similar numbers of flycatcher territories were detected on Salt River tributaries of Pinal

Creek (on private land) and Cherry Creek (A. Madera, Tonto NF, pers. comm.). In 2017, 44 flycatcher territories were documented in the Roosevelt Lake Habitat Conservation Plan (HCP) area downstream from the action area within and adjacent to the conservation space of Roosevelt Lake. The Rockhouse (habitat creation) Demonstration Site nearby had an additional 21 territories.

## Environmental Baseline

The environmental baseline includes past and present impacts of all federal, state, or private actions within the action area. Proposed federal actions within the action area that have undergone formal or early section 7 consultation are included in the environmental baseline discussion (Table 7). The environmental baseline discussion defines the status of the flycatcher and its habitat within the action area. This discussion serves as a platform to assess the effects of the action to the flycatcher now under consultation.

## History

For over a century, ranchers have used lands in the project vicinity for cattle and sheep grazing. People and communities associated with ranching operations have been an integral part of life in this part of Gila County for over one hundred years. When the Forest Service was established in the western United States, domestic livestock were already grazing within the Tonto NF including the action area. Reduced vegetation cover and soil erosion occurred in many places because of concentrated livestock use and drought conditions. Initially, grazing permits were based on the number of livestock these first ranchers grazed. With very few fences present on the landscape, livestock followed the most palatable forage wherever it occurred.

Over time, domestic livestock management has evolved as more information on the effects of livestock grazing on other resources has become available. In addition to permitting manageable, resource and landscape-appropriate herd sizes, grazing systems that incorporate an element of vegetative rest have been implemented. Current management also incorporates fencing, herding, salting, rotational grazing, and water development to distribute livestock and provide periodic rest to vegetation and water resources. Overall, current resource conditions demonstrate significant improvement over historic conditions. The preliminary EA provides an expanded description of current vegetation, soils, and water resource conditions in relation to livestock grazing.

No readily available detailed records exist about past wildfires or prescribed fires in the action area. However, because the uplands in pastures adjacent to the river and Pinal Creek are primarily upper Sonoran Desert scrub communities, it can be anticipated that the area has experienced low numbers of small wildland fires on these desert uplands. These small fires would have affected plant composition, soil, and watershed conditions at a local scale. Limited vegetation and noxious weed treatments may have occurred in the past at small isolated locations on upland slopes above the river and Pinal Creek, but there are no records. Weed treatments could occur currently if implemented consistent with the 2012 noxious or invasive plants EA consulted on August 6, 2012 (AESO/SE 22410-2009-F-0018).

Table 6: Formal consultations that have occurred from 2005 to present

Formal consultations on the Tonto NF from 2005 through 2018.					
Consultation #	Date of BO	Project	# of Territories Anticipated Taken	Form of Take Anticipated	Critical Habitat
02EAAZ00-2014-F-0463	3/1/16	Tonto NF Travel Management Rule	N/A	N/A	Adverse effect to CH, no adverse modification
02EAAZ 00-2012-F-0423 02EAAZ00-2007-I-0221	7/24/14	Proposed Grazing for three allotments (Tonto Basin, 7/K, Walnut)	N/A	N/A	No adverse effects, no adverse modification
22410-2009-F-0018	8/6/12	Tonto NF Noxious or Invasive Plant Treatment	N/A	N/A	Adverse effect to CH, no adverse modification
2012-F-0011	4/30/12	Southwestern Regional Land	2 territories annually	Harassment	Adverse effect to CH, no adverse modification

		Resource Management Plans Tonto NF			
22410-2004-F-0447	7/27/11	Tonto and Oak Creek Bridge Development	N/A	N/A	Adverse effect to CH, no Adverse modification
22410-2007-F-0218	8/17/09	Ongoing Grazing for Three Allotments	N/A	N/A	No adverse effects, no adverse modification
22410-2006-F-0365	7/17/08	Arizona Forests Utility Corridor Maintenance Phase II	All flycatchers nesting in ~5.5 acres of habitat	Harassment	Adverse effect to CH no adverse modification
22410-2003-F-0430	4/1/08	Issuance of Section 10(a)(1)(B) permit to Salt River Project for Incidental Take associated with operation of Horseshoe and Bartlett Dams	All flycatchers nesting in 200-400 acres within Horseshoe Lake	Harassed, harmed, injured, or killed.	No CH within Horseshoe Lake conservation space, no adverse modification along river.
22410-2006-F-0364	7/5/07	Arizona Forests Utility Hazard Tree Removal Phase I	N/A	N/A	Adverse effect to CH, no Adverse modification.
2-21-03-F-0003	2/21/03	Issuance of Section 10(a)(1)(B) permit to Salt River Project for Incidental Take associated with operation of Roosevelt Lake	All flycatchers nesting in 1,250 acres within Roosevelt Lake	Harmed, injured, or killed.	No CH.

Since 2005, incidental take in the form of harassment was anticipated during implementation of utility hazard tree removal but not from grazing. The proposed hazardous line repair activities were scheduled to occur during the flycatcher breeding season (May 1 to August 31). Some projects occurred that had adverse effects to flycatchers and/or their designated CH on Tonto NF lands, but the Tonto NF was not the lead agency. For example, adverse effects to CH are anticipated due to the proposed Tonto Creek Bridge development, which was consulted on in 2011, but has not been implemented. Similarly, Salt River Project (SRP) dam operations were anticipated to incidentally take flycatchers on Tonto NF managed land. The SRP has developed HCPs for their dam operations at Roosevelt Lake and at Horseshoe and Bartlett Lakes. Adverse effects were also anticipated during implementation of the Travel Management Rule, which was consulted on in 2016, but has not been implemented.

### Status of the Species within the Hicks-Pikes Peak Allotment Action Area

In 2005 grazing was removed from the Salt River and 23,000 upland acres immediately adjacent to the floodplain, which resulted in a USFWS concurrence with a “may affect, but is not likely to adversely affect” determination in the 2005 biological assessment for grazing on the Hicks-Pikes Peak Allotment {USFWS 2005} (USFS 2005).

Upper Salt River, upstream from the Highway 288 Bridge is a free flowing segment of the river. Riparian habitats along this river segment can be described as occurring within a generally canyon bound floodplain. Larger patches of riparian vegetation capable of supporting breeding flycatchers occur where the floodplain becomes wider and where tributaries enter the canyon. These wider patches occur along many, but not all of the approximately 19 river miles within the action area. Prior to 2005, the river was surveyed sporadically from 1997-2006 to detect flycatchers, but none were detected (Ellis *et al.* 2008). Flycatchers were first detected along the river in 2007 and protocol and presence/absence surveys were conducted at some higher quality riparian habitat patches between 2007 and 2012, and again in 2016. Habitat patches on the river occupied by flycatchers between 2007 and 2012 included Horseshoe Bend and Chalk-Coon Creek/Redmond Flat areas. Horseshoe Bend had one territory in 2007 and again in 2016 when it was the only area surveyed. Chalk-Coon/Redmond Flats area had one territory in 2012 and flycatchers were using both sides of the river. Nail Creek had suitable habitat, but no flycatchers in 2011. Flycatcher territories were in mixed exotic/native, and exotic riparian vegetation. Breeding habitat along the river

within the action area consists primarily of mixed exotic/native riparian vegetation dominated by tamarisk with smaller developing inclusions of cottonwood-willow vegetation where the water table remains elevated. (Bush 2017), (SWCA 2011), (Ellis *et al.* 2008).

Flycatcher habitat also occurs along Pinal Creek, which runs near the western edge of the allotment and is tributary to the river near the downstream edge of the action area near the Hwy 288 Bridge. Documented occupied flycatcher habitat along Pinal Creek is on private lands. Flycatcher territories are in high quality cottonwood-willow habitat adjacent to the North Steer, South Steer, and Yellow allotment pastures. In 2011, surveys detected seven flycatcher territories on private lands along Pinal Creek. Territory numbers were four in 2017, 3 in 2018, and 8 in 2019. Downstream from private lands, Pinal Creek runs through the North Steer and Lower Shute Springs allotment pastures, and adjacent to the Klondike Pasture on a neighboring allotment. This stream segment runs for about 6-7 kilometers to where it flows into the river near the Highway 288 Bridge. Except for approximately ½ mile (7 acres) of potentially suitable habitat near the private/forest boundary in AZ. Salt River Peak Quadrangle Map Section 26, riparian habitats in this segment of Pinal Creek are generally of higher stream gradient than where breeding flycatchers are usually found. Flows also become interrupted perennial or intermittent near where Pinal Creek flows into the river. However, Pinal Creek habitats in this stream segment have areas of dense riparian vegetation that provide connectivity between the Roosevelt Lake breeding sites, and the isolated population on private lands upstream along Pinal Creek. Forest riparian habitats along Pinal Creek also provide non-breeding habitats, migratory habitats, and some areas of regenerating/restorable habitat for flycatchers where stream gradients are lower. Riparian habitats in this reach of Pinal Creek may also be used as “refugia” habitats as described in the flycatcher Synthesis Report (Paxton 2007). For example, flycatchers may use Pinal Creek riparian habitats when suitable habitats at Roosevelt Lake become inundated as part of the dynamic environment of riparian habitats surrounding the lake. Four banded flycatchers from Roosevelt Lake were detected on Pinal Creek following habitat inundation at the lake (Ellis *et al.* 2008).

Recent observations indicate riparian habitat conditions along the river have been improving since approximately 1999-2000. This began as livestock were removed from Forest portions of the river, and accelerated as large amounts of sediment were deposited from upstream wildfires. Tonto NF personnel have reported that non-native and native riparian vegetation is establishing at many locations along the river. District river rangers have characterized the river as being in what they describe as a river building phase where floodplain side-channels are filling in with sediment and riparian vegetation is establishing. Riparian vegetation seedlings have been observed establishing along the river and tributary floodplains. During flycatcher surveys from 2007-2011, the Globe District Biologist observed high quality off channel floodplain habitats at Coon-Chalk Creek, Redmond Flat, Horseshoe Bend and segments of Pinal Creek. These included multiple age classes of dense riparian vegetation interspersed with openings, backwater areas, off channel pools, ponds, wet areas, and oxbows, all of which can be important habitat components for flycatchers and other riparian and aquatic wildlife species. Flycatchers were detected between 2007 and 2011 at these breeding patches, and a single territory was detected at Horseshoe Bend in 2016. Flycatchers were not detected in 2016 where Coon Creek flows into the river as they have been in past years. Suitable and potentially suitable habitats also occur near Nail Creek, and Cherry Creek where they flow into the river.

The river within the action area is designated flycatcher CH from near the Highway 288 Bridge upstream to where Cherry Creek flows into the river. Primary Constituent Elements (PCEs) and physical and biological features of CH occur throughout this CH segment wherever the floodplain widens, but their structure, suitability, and configuration may change over time with changing river hydrology and/or resource management actions. The PCEs and biological and physical features of flycatcher habitat generally occur within the 100-year floodplain or flood-prone area, and are interrelated (USFWS 2013).

## **Factors Affecting the Southwestern Willow Flycatcher and its Critical Habitat within the Salt River Allotments Action Area**

Impacts to flycatchers and CH from past and present actions within the Hicks-Pikes Peak Allotment Action Area associated with grazing, ranching and farming activities on private and federal lands, mining, recreation including OHV recreation, truck camping, fishing and white-water rafting. Roads, their use and management can also cause impacts to flycatchers and CH. The action area consists of primarily NFS lands; however, one 40 acre leased, private parcel borders the river at Horseshoe Bend, and mine property, a large horse ranch, and many small and medium size private parcels in the vicinity of Pinal Creek. There is less State or tribal lands.

**Grazing, ranching, farming and other activities on private lands:** Between where Mud Springs Wash and Storm Canyon enter the Salt River at Horseshoe Bend, there is a parcel of private property that has been used historically for grazing and grazing management activities connected to previous permittees managing the Hicks-Pikes Peak Allotment (see Figures Maps 1-2). Livestock use on this parcel appears to have been light since cattle were removed from the adjoining pastures in 2000; however, in the mid-1990s intensive livestock grazing occurred on this parcel and surrounding forestlands. The current livestock permittee has leased this private parcel and it is anticipated that it will be used like a holding pasture/corral for managing livestock on adjoining portions of the allotment including the Ortega and Shute Springs pastures. One or more water troughs on the private parcel appear to have their water source on the Forest at Storm Canyon Well. The private property boundary appears to extend into the river floodplain and current river channel, but this may be a mapping error. Existing fences adjacent to the floodplain have been damaged by scouring and recreationists, and are absent in some places.

Along Pinal Creek intermixed within mine lands are a variety of other private land parcels that can best be described as rural living parcels. They include suburban residences, small ‘ranchettes’, horse properties, and related rural settings. There are substantial existing cowbird feeding attractants and feeding areas such as a variety of farm animals, grain feeding, bird feeders, lawns, barns, and barnyards. When combined, these areas would be similar in effects to presence of a livestock holding pasture or a small feedlot.

**Grazing, ranching, and farming activities on Forest lands:** Grazing and livestock management activities including range improvements on uplands and in tributary drainages upstream from flycatcher habitats may already affect flycatcher habitats, and existing range improvements are already livestock concentration areas. Chapter 1 of the 2019 draft Hicks-Pikes-Peak Environmental Assessment reports that historic over-grazing has had the most extensive effect on watersheds, stream channels and riparian areas. All of the watersheds in the action area remain in Functioning at Risk or Impaired watershed condition, and one of the indicators contributing to these ratings is poor riparian condition. Upland watershed conditions have likely improved somewhat during recent lower grazing use periods, which include some periods of livestock non-use. For example, the Lower Shute Springs and Ortega Pastures, which border flycatcher habitats along the Salt River were not grazed from approximately 2000-2018 and have visible indicators of substantial riparian recovery including growth of non-native and native riparian vegetation. Pinal Creek within the allotment has also had little or no grazing since approximately 2006 and has substantial recovery of riparian vegetation. Pinal Creek also has a supplemental water supply originating on upstream private lands contributing to perennial flow segments, and improved water quality along most of the creek within the allotment. However, much of the livestock water on this allotment is provided by springs and wells located in drainages. The key reaches on this allotment have high potential to support lush riparian areas, but are used as water sources and typically receive high livestock use. Most of the stream channels evaluated recently in the field are in unstable or impaired condition. Two example key reaches are Mud Springs Wash and Sycamore Canyon, which drain into flycatcher CH at Horseshoe Bend on the river.

Brown headed cowbirds are a native bird species that occurs throughout the range of the flycatcher. Cowbirds affect individual flycatchers and flycatcher populations by laying their eggs in flycatcher nests, which the flycatchers then incubates and raises the cowbird young. Livestock, along with other activities, are considered a cowbird feeding area attractant (USFWS 2014), which can attract increased numbers of cowbirds and may increase cowbird parasitism of flycatcher nests at nearby breeding sites. There is no historic information about cowbird parasitism on the allotment, but given high historic stocking rates in the vicinity of the action area, livestock have



likely been a feeding area attractant in the action area historically. At nearby Roosevelt Lake, cowbird parasitism rates have ranged from generally low (3%) to 43 percent when plant vigor at Roosevelt Lake decreased because of drought conditions. Flycatcher nesting habitats in the action area are smaller than those at Roosevelt Lake are, consisting of from 1-2 territories along the river in small patches of riparian vegetation where the floodplain is wide. Studies have reported that several factors including smaller patches of nesting habitat are likely to increase the risk of brood parasitism on flycatcher nests. Recent information from flycatcher surveys along the river observed only that cowbirds were present during some surveys. Cowbird parasitism is currently considered a moderate threat to the flycatcher Range-wide (USFWS 2014).

**Recreation:** In the vicinity of Horseshoe Bend, OHV related recreation activities have in the past, and continue to alter and remove components of CH, especially PCE 1. OHVs including trucks, UTVs and ATVs drive through riparian vegetation to the river's edge to park and recreate. Most recreation includes fishing, truck camping, and OHV riding. At low water, Trucks, UTVs, ATVs, motorcycles, and occasionally dune buggies have been observed crossing the river into riparian habitat where the 2007 territory was located near an oxbow on the north side of the river. People fishing also drive ATVs along the floodplain searching for fishing spots. These activities remove and damage mature and young riparian vegetation preventing or slowing its development, compact soils, cause erosion and sedimentation, and damages floodplain features including, the water table, small ponds, and areas with saturated soils. When these activities occur during flycatcher nesting season it could discourage breeding, dislodge or disturb nests, eggs, or young, causing individual mortality.

A large gate was installed across Forest Road 219 in 2012 primarily to stop motorized access to wilderness, but also to stop damage to the river floodplain, which is occupied and CH for the flycatcher, and other federally listed species and critical habitat. Prior to the gate being installed, people left trash including food scraps, plastic and aluminum cans, bottles, human excrement, toilet paper, and diapers on the floodplain. River rangers removed trash before, during and after rafting season. At other times of the year by forest service employees visiting the site removed trash. There was a 50-gallon burn barrel within CH where trash was occasionally burned. This was removed after installing the gate, and little or no trash was observed after that. The gate was re-opened in 2017 to facilitate easier access for the current livestock permittee to the private parcel, and to portions of the Ortega Pasture near Horseshoe Bend. The permittee constructed a pipe rail barrier to prevent vehicles from accessing the floodplain from forestland where Grapevine Wash enters the river. However, the river floodplain can now be accessed from the private parcel and observations indicate that recreationists have pioneered trails upstream back onto forestlands behind the barrier, to access fishing spots along the floodplain upstream for an uncertain distance, most likely up to one mile upstream. Most damage to the river floodplain at Horseshoe Bend is the result of route pioneering including backing onto or near the floodplain edge, and occasionally driving into, and across, the channel at low water. It is uncertain whether trash will begin to accumulate again along the river floodplain now that the gate is open, but forest service employees have observed small amounts of trash recently.

The upper Salt River is a popular white-water rafting river during the months of March and April with lower use levels in late February and early May in high runoff years. Rafters camp anywhere along the river, but there are 21 mapped camps within the action area. River camps are generally on beaches, or open or sparsely vegetated areas on terraces just above the floodplain. During March and April, rafters may trample trim, or occasionally cut riparian or upland vegetation to get to frequently used camp areas. This may overlap with the early part of flycatcher breeding season.

People using canoes and kayaks float down the river infrequently during late spring, summer, and fall months. A few individuals and small groups also walk into the river from Redmond Wash and Coon Creek. They occasionally leave trash, and at least one trail has been observed cut through riparian vegetation near Coon Creek, which is flycatcher CH (Bush 2016).

**Mining:** Past mining and related activities occurred throughout portions of the entire allotment, but mining impacts on what is now flycatcher habitats occurred within the Pinal Creek watersheds along Pinal Creek upstream and upslope of Forest Lands. In 1875, silver was discovered in nearby Richmond Basin. Subsequently, the Mack Morris Mine was established and a ten-stamp mill was installed on Pinal Creek to process its ore (Dobyns 1981). In the

early 1880s, three water jacket furnaces were built on Pinal Creek. Pinal Creek was also subjected to placer mining (Dobyns 1981). There were also smelters and mills in operation in Globe and Miami. All these mining operations required huge amounts of wood for fuel and building purposes, which resulted in severe removal of timber in the surrounding areas (Dobyns 1981).

When rains came, there was little groundcover left to slow the water. In February 1891, two large floods occurred in the watershed south of Globe, Arizona, and had a devastating effect on the channels in the local Pinal Creek watershed (Dobyns 1981). Overland flow and subsequent erosion of the uplands overwhelmed streams. Soil surface layers and large areas of floodplain were washed away. Stream channels down cut, widened, and lost connectivity with the underground water table, leaving the wide, unstable, dry channels existing along Pinal Creek today (Dobyns 1981).

Riparian habitats with documented flycatcher presence now occur on private mine lands along approximately 6 kilometers of Pinal Creek adjacent to the North Steer, South Steer, Big, Yellow, Lower Devore, and Hicks, Pastures of the Allotment. These private lands were excluded from being designated as CH because they are managed through the Pinal Creek Management Plan resulting in a water and land use plan specific to protecting flycatcher habitat (78 FR 344, January 3, 2013).

Pinal Creek riparian habitats on private lands can currently be described as a Fremont cottonwood, Gooding's willow riparian gallery forest including other riparian tree species. Tamarisk, mesquite, tree-of-heaven and other shrubs occur in the midstory (Freeport-McMoRan Corporation 2012). From 0-8 flycatcher territories have been documented within these riparian habitats from 2003-2006 (Ellis *et al.* 2008), {78 FR 344, January 3, 2013}, (Freeport-McMoRan Corporation 2012, 2018).

Groundwater contaminated during past and recent mining operations nearby is captured behind an underground retention barrier on private lands of lower Pinal Creek, near Wheatfield, AZ. Water is treated in a plant where mining related heavy metals such as lead, and other contaminants are removed. After treatment, a portion of the water is released back into Pinal Creek on private lands downstream of the groundwater barrier (Freeport-McMoRan Corporation, 2012). These flows continue downstream along Pinal Creek through forestlands for approximately 6-7 kilometers to where Pinal Creek flows into the river near the Hwy. 288 Bridge. Visits to this area from 2010-2014 indicate that fence conditions along Pinal Creek would allow livestock from adjacent allotment pastures to access riparian habitat on both forest and private lands along Pinal Creek whenever livestock were in adjacent pastures (U.S. Forest Service, 2010, 2011, 2014). Seasonal livestock grazing (November 1 to March 31) is part of the Pinal Creek Management Plan on private mine land (Freeport-McMoRan Corporation, 2012).

Due to remediation efforts that intercept, treat, and release higher quality water downstream, Pinal Creek is now perennial throughout much of the action area, except for 1-2 kilometers near where it flows into the river. This segment now has intermittent and/or subsurface flows. These efforts along with fencing and lack of grazing on forest segments downstream has resulted in substantial growth of native broadleaf riparian vegetation along with some non-native species. However, some residual effects of mining remain within the stream channel on forest riparian habitats downstream. Designated uses of the creek were changed to an effluent dominated stream and the stream was recently assessed as attaining some uses, as described in the water quality section of the Hicks-Pikes Peak Environmental Assessment. The middle and lower Pinal Creek sixth code watersheds are in impaired watershed condition. Some observers have attributed the current lack of surface flows and surface water connectivity of Pinal Creek with the river to remediation activities, but it may be a combination of past and present actions including residual impacts from past grazing and mining activities described above combined with other factors including river hydrology.

More recently, unauthorized activities related to water monitoring were observed on forestlands along Pinal Creek downstream from mine property. The primary observation was trail-building activities to make it easier for water sampling personnel to get to their sampling site at Inspiration Dam. This resulted in a five-foot wide path cut through Pinal Creek riparian habitat. Activities included cutting cottonwoods, willows, and other vegetation with

chainsaws (Madera 2011 SWWF Survey). The mine property-forest boundary fence was not maintained in 2011 and livestock were observed on forest and mine property.

**Roads and road management:** Existing roads occur throughout the action area, some of which drain into flycatcher habitat. These include State highway 188 and moderately to lightly traveled forest roads used primarily for recreation, but also ranching and mining. Minor forest roads in ephemeral drainages drain directly into flycatcher CH on the river, and into occupied habitat on private lands along Pinal Creek. They also drain into potentially suitable, migratory, and connectivity habitats on forest lands along Pinal Creek. Forest Road (FR) 219 is in and adjacent to ephemeral and intermittent stream channels which have riparian vegetation and drain into CH at Horseshoe Bend. Approximately 2 miles of FR 219 drains into the river, and it is the major road access to Horseshoe Bend for recreationists, permittees and ranch hands, the Forest Service, and other users. The county maintains the road most of the way to the river. Approximately six numbered roads drain into CH on the river. Two numbered roads drain into Pinal Creek. Uses and maintenance of these roads likely contributes to downstream erosion, sedimentation, and other effects. The extent of cross-country travel in areas draining into flycatcher habitat in the action area is uncertain. User created routes can be observed, especially in some areas draining into Horseshoe Bend, but cross-country travel in many areas draining into flycatcher habitats may be limited by steep and complex topography.

Tonto NF is drafting the Travel Management Rule, which has a goal of reducing non-essential roads for watershed and resource protection and designates a system of roads and trails for motorized vehicle use on the forest. The Forest consulted on this project in 2015 and received the biological opinion in 2016 (02EAAZ00-2014-F-0463). The biological opinion agreed that short-term effects to the flycatcher could be expected, but did not anticipate that implementation of the Travel Management Rule proposed action was reasonably certain to result in incidental take.

In general, the permittee would be required to follow Travel Management policies and limit the use of motorized vehicles to those roads and trails designated on the Motor Vehicle Use Map after the final travel management decision is signed and the Motor Vehicle Use Map is published. However, according to the final Travel Management Rule, motor vehicle use exempted from designation includes “Motor vehicle use that is specifically authorized under a written authorization issued under Federal law or regulations” (36 CFR 261.13(H)). Grazing permits fall under this exemption. In compliance with R3 Supplement to Forest Service Handbook 2209.13 15.13b, legitimate motorized use, including cross-country access, needed for conducting activities required under term grazing permits would be authorized unless compelling natural and/or heritage resource issues require postponement or modification of the activity.

**Drought:** In the Salt River Canyon area, drought occurs from 3-4 out of every ten years (Davis et al. 1986). Drought has affected flycatcher nesting success at nearby Roosevelt Lake (Ellis *et al.* 2008), and has likely affected riparian vegetation and floodplain resources during previous droughts along the river within the action area.

## **Southwestern Willow Flycatcher Effects Analysis**

In the final rule to designate the flycatcher as endangered, USFWS describes activities that could potentially harm the flycatcher and result in take of the subspecies. Activities listed that involved grazing were: 1) livestock grazing that results in direct or indirect destruction of riparian habitat; and 2) activities such as continued presence of livestock and fragmentation of flycatcher habitat that facilitate brood parasitism by the brown-headed cowbird (USFWS 1995). Effects of authorizing grazing, brood parasitism, range improvements, and grazing related cross country travel on the Hick-Pikes Peak Allotment are discussed below.

### **Grazing Effects - Flycatcher**

Livestock grazing in flycatcher habitats in the action area could potentially have effects when livestock consume and/or trample vegetation slowing or preventing its growth and development into suitable habitat that could be occupied. Riparian trees within browsing reach, shrubs, saplings, and seedlings would be affected. Grazing would destroy plants, reduce growth and alter structure of individual plants, and make habitat patches more open. Grazing may also fragment habitat patches and modify habitat patch structure increasing edge effects (USFWS 2009, 2014).

Grazing livestock can push pathways through riparian vegetation reducing its density and suitability as breeding habitat. If this happens during the flycatcher breeding season nests can be spilled causing individual mortality when eggs or nestlings are lost. Reducing habitat density can also increase opportunities for predation on flycatchers by a variety of animals including snakes and hawks.

Grazing impacts to the floodplain also affect flycatcher habitat. Grazing livestock can trample/trail and compact soils, reduce off channel floodplain backwaters and reduce or eliminate surface pools and ponds, and increase drying of saturated soils. Intensive floodplain grazing can also contribute to lowered groundwater tables affecting seed germination, growth and suitability of flycatcher habitat, and favoring development of non-native riparian species such as tamarisk over native riparian communities (USFWS 2002). Such impacts can reduce riparian vegetation development and potential flycatcher habitat suitability, and could indirectly affect proximity of habitat to water, saturated soils, and flycatcher food resources (insect prey populations).

The extent of grazing effects on specific flycatcher habitat characteristics such as dense riparian vegetation and high water tables are not known (USFWS 2002). However, flycatchers nest in dense riparian vegetation, forage primarily within the floodplain, and are susceptible to predation and cowbird brood parasitism, therefore effects can be expected when grazing modifies riparian vegetation or floodplain characteristics. Effects would vary with extent timing and intensity of grazing.

Consideration of grazing on watershed uplands adjacent to flycatcher riparian habitats is essential to those riparian habitats (USFWS 2002). Uplands and aquatic systems are linked and grazing on uplands above riparian systems can affect vegetation and soils, cause bank destabilization, increased runoff, and changes in runoff patterns, thereby causing increased sedimentation, increased erosion, and reduced capacity of soils to hold water (Johnson 1992, Weltz and Wood 1994 as cited in USFWS 2002 and USFWS 2014). Grazing can contribute to changes in the water holding capacity of the watershed, thereby increasing the volume of flood flows while decreasing their duration (Brown et al. 1974, Gifford and Hawkins 1978, Johnson 1992 as cited in USFWS 2002). As a result, groundwater levels may decline and surface flows may decrease or cease (Cheney et. al. 1990, Elmore 1992 as cited in USFWS 2002). These changes may cause riparian habitats to become drier and affect development of flycatcher nesting and foraging habitat, prey resources, connectivity, and migratory habitats.

Although authorizing grazing may affect flycatchers and their habitats indirectly, livestock will not have access to Salt River or Pinal Creek riparian habitats and therefore there will be minimal direct grazing effects in flycatcher habitats as long as fences and management/monitoring continue to keep livestock out of these riparian habitats. Indirect effects along the Upper Salt River are discussed as part of the CH section.

Indirect effects from grazing cattle along 4-5 kilometers of the Lower Shute Springs pasture bordering Pinal Creek would occur near flycatcher habitats during years when this pasture is grazed. Grazing up to 250 cattle for up to 9 months could occur within this pasture, but actual cattle numbers and grazing period lengths would vary with annually with changing resource conditions. Grazing could occur on uplands adjacent to the floodplain, but outside of Pinal Creek riparian habitats. This segment of Pinal Creek is approximately 4 kilometers downstream from where existing flycatcher territories occur on private lands along Pinal Creek. Indirect grazing effects could reduce the quality of migratory habitat along Pinal Creek and reduce site connectivity between the isolated flycatcher population upstream on Pinal Creek and the large population at Roosevelt Lake. Indirect grazing effects could also reduce the quality of riparian habitats along lower gradient portions of Pinal Creek, which could become potentially suitable or be used as refugia habitats (Paxton et al. 2007) during periods when Roosevelt Lake habitats become inundated.

Potential indirect watershed effects caused by grazing uplands draining into flycatcher habitats along Pinal Creek, and the river would be reduced by implementing upland and riparian allowable vegetation use thresholds, which can provide a residual protective vegetation layer contributing to maintaining watershed condition. Indirect grazing effects will also be reduced by grazing the Lower Shute Springs Pasture at different times each year as part of a deferred grazing system. Erosion and sedimentation caused by grazing actions is anticipated to be undetectable from existing erosion from naturally erosive granitic soils, and remaining effects from past management practices

on allotment soils and vegetation. The supplemental water source and other conservation measures upstream on private lands along Pinal Creek may also contribute to reducing specific downstream effects including potential effects associated with a drying floodplain described above.

## **Cowbird Parasitism Effects – Flycatcher**

### **Background**

In 2014, the five year review of the flycatcher concluded that brood parasitism by brown-headed cowbirds continues to be a moderate threat. The review recommended caution in the future because a large proportion of flycatcher breeding sites (84%) currently have less than five territories and are established where riparian habitats are less expansive and potentially more susceptible to parasitism than large populations with more habitat. Caution about future vegetation impacts from the tamarisk leaf beetles, which can defoliate tamarisk vegetation and significantly reduce nesting success was also noted (USFWS 2014).

The 2005 version of the Framework for Streamlining Informal Consultation for Livestock Grazing Activities (USFWS 2005) determined that restricting livestock activities within 2 miles of occupied flycatcher habitat during a critical season (April 1 through July 31) would remove the majority of threat of cowbird parasitism. This was based on guidance from the recovery plan (USFWS 2002) who showed that cowbird abundance may at least be reduced by landscape-level actions because cowbird abundance has been shown to decline with increasing distance from anthropogenic food sources over distances as short as 2-4 km (Verner and Rothstein 1988, Tewksbury et al. 1999, Curson et al. (2000) ). The Southwestern Willow Flycatcher Recovery Team noted that as their guidelines are applied and results are monitored, the 2-mile criterion may change, and that this may precipitate a need to re-evaluate any effects determinations made in this (2005) guidance document.

A 2009 flycatcher supplement to the 2005 Framework removed specific set distances to maintain cattle from flycatcher nesting sites primarily because studies showed that distances cowbirds travel from feeding areas to riparian areas where female flycatchers lay their eggs vary among breeding sites with a small proportion of female cowbirds commuting 14 km or more each way daily (Curson et al. 2000). Distances can vary based on many factors, including cowbird attracting activities on surrounding lands, location and abundance of suitable feeding areas in relation to suitable breeding and egg laying areas, host populations, landownership patterns, and other factors. It is also important to have site-specific information about flycatcher productivity and parasitism rates in order to make the best decisions (USFWS 2009).

The recent flycatcher status review summarized information from other sources indicating that cowbird parasitism levels, as indicated from extensive monitoring across the flycatcher's range, can vary widely (USFWS 2014).

An updated Framework for Streamlining Informal Consultation for Livestock Grazing Activities was approved in 2015. The flycatcher brood parasitism information was similar to the 2009 flycatcher supplement summarized above, but had a different critical season (May through July), and did not incorporate information from the recent 5-year status review of the flycatcher (USFS 2015).

Forest permitted livestock have been excluded from grazing along most of river and Pinal Creek in the action area since approximately 2000. The amount of area excluded has varied from entire pastures (Shute and Ortega), to portions of pastures, bordering Pinal Creek where access to the creek is limited by fences or natural barriers such as cliffs, steep rocky terrain, or rock outcrops. In areas where natural barriers and fences discourage livestock presence, exclusion is not always complete, and some livestock grazing in excluded areas is observed. Riparian habitat damage has been observed, but has been minor and intermittent in most instances, and can be attributed to livestock and recreation. Habitat damage has occurred near Horseshoe Bend and along Pinal Creek in areas where gates are left open, fences lack recent maintenance, or have been cut or modified occasionally. Fences are cut to access wilderness and/or riparian areas along the river with vehicles.

## General Effects

Brood parasitism by brown-headed cowbirds can negatively affect individual flycatchers and populations by reducing reproductive performance. The cowbird lays its eggs in the nests of other species. The “host” species then incubate the cowbird’s eggs and raise the young. Because cowbird eggs hatch after relatively short incubation and hatchlings develop quickly, they often out-compete the hosts’ own young for parental care. Cowbirds may also remove eggs and nestlings of host species from nests (or injure nestlings in nests), thereby acting as nest predators (USFWS 2014). Cowbirds parasitize the nests of over 220 species of North American songbirds (nestwatch.org 2018). The cowbird is a native North American bird and their impacts are unlikely to endanger host species unless they are accompanied by major ecological changes. Two such possible changes are: an increase in the abundance and distribution of cowbirds, and a loss or deterioration of *host* breeding habitat. Both may be occurring as a result of settlement and land uses over time, but the latter is recognized as the major cause of the southwestern willow flycatcher’s decline (USFWS 2002).

## Allotment Specific Effects

Livestock grazing authorized in the proposed action, will occur within the Ortega and Lower Shute Springs pastures. Grazing has been excluded from these pastures since 2000. A drift fence was constructed on East Ortega Pasture to keep livestock from accessing riparian habitat along the Salt River (Figure 2, Map Appendix). Additional drift fence segments will be built near Horseshoe Bend (F2), Redmond Flat (AF4), Nail Creek (AF4), Shute Springs Creek (AF4), and along Pinal Creek (AF4) {Figure 2, Map Appendix}. Drift fence segments tied into natural barriers (steep terrain features such as cliffs) are anticipated to keep cattle from accessing the river and Pinal Creek riparian habitats within the 100-year floodplain and flood prone areas. However, livestock will be able to graze uplands as close as 100-200 meters from the river in some locations when the Ortega and Lower Shute Springs pastures are used. Under the 2005 Hicks-Pikes Peak USFWS concurrence, cattle did not graze these pastures and were from approximately 1-3 miles from flycatcher habitats on the river.

Drift fences may have to be added in additional locations to keep cattle from accessing the river if fences as mapped prove inadequate to keep livestock off the river and Pinal Creek floodplains.

Water developments and fences, which can concentrate livestock, may create areas of heavy use within 200 meters of river flycatcher habitat. New water developments will be placed from between 0.6 kilometers (Horseshoe Bend) and 0.8 kilometers of the river as mapped in the proposed action. All improvement locations on maps are approximate they can be constructed at any location meeting the sideboards for additional infrastructure listed in the Hicks-Pikes Peak EA. Mineral and salt supplements, which may also attract cattle may be placed closer to flycatcher habitats under the proposed action, but must be constructed at least ¼ mile (400 meters) from natural water sources such as the river. Approximately 12 new water troughs would be placed within or near 2 kilometers of flycatcher habitats along the river.

The flycatcher status review (USFWS 2014) noted that landscape management focusing on reducing cowbird feeding areas (e.g. corrals) or by increasing the distance between feeding area attractants (e.g. livestock) and bird nesting areas may be useful and long-lasting methods to reduce cowbird abundance at a landscape level in some situations, as an alternative to cowbird trapping (USFWS 2002, Appendix F, pp. 15-16; Goguen and Matthews 2000, p. 1868). Implementing the proposed actions has the potential to increase the probability of cowbird presence on the landscape, and cowbird parasitism at flycatcher nests along the river and Pinal Creek.

Studies summarized in (USFWS 2014) reported on factors potentially influencing the susceptibility of flycatcher nests to brown-headed cowbird parasitism and noted that habitat configuration was a factor, as was distance of a nest to the edge of a habitat patch, and a smaller habitat patch size. The configuration of most breeding patches along the river, which so far have generally supported from 1-2 territories is small, linear and with variable habitat quality. A loss of individuals at a small breeding patch may make it less likely that other nearby habitat patches, such as those developing at other locations along the river, would become occupied (Paxton et al. 2007). The current size of occupied habitat patches range-wide is skewed heavily toward small patches and small population

sizes and this situation inhibits recovery (USFWS 2014). In summary, riparian habitat patches along the river can be anticipated to be at a high risk of cowbird parasitism because they occur in small, linear patches, near patch edges.

There are few other cowbird attractants currently present in the Ortega and Lower Shute Springs pastures; therefore, placing up to 300 cattle in proximity to flycatcher habitats in the action area could be expected to increase the probability of parasitism at occupied breeding patches along the river during the ten-year consultation period. Pinal Creek habitat where it borders the Lower Shute Springs and northern portion of the North Steer Pasture is similar, but these habitat patches have lower habitat quality and are less likely to be occupied by flycatchers. Upstream from the boundary between Forest and private land, flycatcher territories are documented along Pinal Creek. They are within mature riparian forest on private land adjacent to the Yellow and South Steer pastures. In this area, many land uses that could attract cowbirds and that are not associated with the proposed action are present. They include rural residences, horse properties, and mining related activities. In most of these areas livestock grazing is already occurring in adjacent forest pastures and on private land where the flycatcher territories are located.

Potential increased effects of cowbird parasitism along the river and Pinal Creek are expected to be reduced by grazing adjacent pastures primarily outside the cowbird critical season as described in (USFS 2015, Pg. 28). Table 7 summarizes proposed grazing period agreements with livestock operators for grazing in pastures adjacent to flycatcher breeding habitats along the Salt River and Pinal Creek.

**Table 6a: Days grazed per pasture near flycatcher breeding habitats, during cowbird critical season (CCS), May 1 through July 31 (USFS 2015).**

Month	Days Grazed (DG) in (CCS): West Lower Shute Pasture	DG in East Lower Shute Pasture	DG in West Ortega Pasture	DG in East Ortega Pasture	DG in Pinal Unit*	Comments
May	0	0	0	0	<b>31 DG</b>	Territories on private land along Pinal Creek adjacent to South Steer and Yellow pastures.
June	0	0	0	0	0	No grazing in proximity to flycatcher habitat
July	0	0	0	0	0	No grazing in proximity to flycatcher habitat

\* Pinal Unit: Yearlings would graze in North Steer, South Steer, Upper Big, Yellow, and Lower Big pastures.

Table 7a,b Narratives: From May 1 through July 31 Forest permitted livestock from the Hicks-Pikes Peak Allotment would not be authorized to graze within the Ortega or the Lower Shute Springs Pastures. Proximity of permitted livestock to flycatcher habitat during the cowbird critical season is displayed in Table 7b and Supplemental Map 3. In May, cattle would be in Forest pastures within the Pinal Unit east and west of Pinal Creek adjacent to flycatcher habitat on Freeport private land. In June and July, cattle would not be in Forest pastures on the Hicks-Pikes Peak allotment adjacent to flycatcher habitat near Pinal Creek. Grazing in these pastures adjacent to flycatcher habitat would occur during the remaining months of the year as described in the proposed action.

**Table 7b: Proximity of Tonto NF authorized grazing on the Hicks-Pikes Peak allotment to flycatcher habitats during the cowbird critical season (May 1 – July 31) {Supplemental Map 3}.**

Location/Pasture	Habitat	Proximity	Comments
Lower Shute Pasture/ Upper Shute Pasture boundary	To previously occupied CH on Salt River (SR)	2.2 km	Territories at Chalk Creek. on Salt River Range of distances = 2.2 - 4.0+ km. Lower Shute grazed between 8-1 thru 4-30.

Same	To nearest CH on SR	0.8 km	Unsurveyed habitat vicinity of Redmond Flat
West Ortega /Horseshoe Bend pasture boundary	To previously occupied CH	2.7 km	Territories at Horseshoe Bend. Range of distances = 2.7 through 5.3 km. Lower Shute grazed between 8-1 thru 4-30.
East Ortega/Hope Pasture boundaries	To nearest occupied CH	2.7 km	Territories at Horseshoe Bend. Range of distances = 2.7 through 6.5 km. Grazed 8-1 thru 4-30.
Lower Shute/Upper Shute boundary on forest, to Pinal Creek	To potentially suitable habitat	1.5 km	Segments of Pinal Creek with lower stream gradient between canyon sections. Lower Shute grazed between 8-1 thru 4-30.
Same as previous	To documented territories	> 2 km	Territories on Freeport private Actual = 5.1 km. Grazed 8-1 thru 4-30.
Yellow	To nearest occupied-private	0.4 km	Territories on Freeport private Range 0.4-2.9 km. Grazed between 11-1 thru 5-31
North Steer	To nearest occupied-private	0.7 km	Territories on Freeport private Range 0.4-2.9 km. Grazed between 11-1 thru 5-31
same	To nearest PSH	0.2 KM	To nearest Potentially Suitable Habitat (PSH) Range 0.2-2.6 km. Grazed between 11-1 thru 5-31.
South Steer	To nearest occupied-private	0.6 km	Territories on Freeport private Range 0.6-4.5 km. Grazed between 11-1 thru 5-31

The 2014 flycatcher status review also noted that the results of long-term flycatcher nest monitoring studies reinforce recommendations reached in the Recovery Plan (USFWS 2002, p. F-28, G-4) that it is most important to focus attention on improving the amount and quality of flycatcher habitat, and landscape conditions, while impacts such as cowbird parasitism are generally less severe.

## Livestock Management Practices - Flycatcher

### Range Improvements

Constructing range improvements such as water developments, fences, corrals, or other developments may have local impacts to soils and watersheds. The practice of clearing vegetation on either side of a fence during construction can expose soil and locally increase erosion and sedimentation. Livestock travel along recently cleared or maintained fence lines, which can result in locally heavy trampling and trailing. These activities could add to the other watershed effects along the river. Effects from constructing range improvements can be minimized by implementing management practices in uplands above flycatcher CHs such as seeding and raking vegetation into areas where soils have been exposed. Brush can be scattered into cleared fence lines to minimize erosion and discourage livestock from using fence lines as travelways. Any effects from constructing range improvements are anticipated to be small, localized, short-term disturbance to soils during construction (Hicks-Pikes Peak Allotment Soils Report). The total number of proposed new improvements on uplands above flycatcher CHs that may be constructed subsequently inspected and maintained would be approximately seven fence segments, 15 water troughs, and their pipelines (F2-west, AF4, AF6, W2, AW24, AW33, AW34, AW36, and AW39). There is one corral and water development near Pinal Creek (AW9 and AW10) {Figure 2, and Map Appendix, Maps 1-2}. Existing improvements would continue to be inspected, maintained, and used during the consultation period.

Once improvements are constructed and grazing is implemented in the Ortega and Lower Shute Springs pastures, some improvements will have a component of beneficial effects because the fences will prevent cattle from accessing and crossing the Salt River, and grazing within flycatcher CH. Fences will contribute to improving cattle distribution and the water troughs will help provide additional livestock water away from the river. As stated by Clary and Kruse (2004), "Encouraging livestock away from riparian areas is, in many cases, a key management activity. Development of off-stream water sources is often the easiest way to do this." However, placing new water developments in areas that have received little use may cause new areas of heavy use (McAuliffe 1998). Levels of moderately higher livestock use would be expected to occur in areas within one-quarter mile (400 meters) from water trough locations.



## Consequences of livestock management activities on private land at Horseshoe Bend

Consequences to the flycatcher from livestock grazing could occur on the 40-acre parcel of private land leased by the grazing permittee. Infrastructure on the parcel improved in 2018 indicate its use will be similar to a holding pasture or large corral facility to facilitate managing livestock grazing on surrounding allotment pastures. Existing improvements on the parcel suggest that this was also its historical use. Improvements on the private parcel related to grazing management include fences, gates between the private parcel and allotment pastures, water troughs with at least one connected to an existing forest water development in Storm Canyon, a water storage tank, a cattle guard, and a recently constructed smaller cattle holding facility. Livestock management activities anticipated to occur on this parcel could include a variety of livestock transport, movement and husbandry practices including use of vehicles such as trucks, trailers, and occasionally heavy equipment.

The effects attributable to actions occurring on the private parcel that would likely cause effects to individual flycatchers are increased cowbird parasitism on any flycatcher territories at Horseshoe Bend during the consultation period. Livestock are expected to be present within the Ortega and Lower Shute Springs pastures, and within the private, leased parcel during the period between August 1 through April 30, but not during the most recently described cowbird critical season from May 1 through July 31 annually. Outside of the cowbird critical season, livestock would be expected to be on uplands within 200 meters from the active (2016) flycatcher territory. Consequences on flycatcher critical habitat will be discussed in the critical habitat section below.

### Off-Road Travel

As described in the Proposed Action, the grazing permittee may be authorized to travel off-road in a motor vehicle for purposes of managing the allotment. These actions include off-road travel to construct new range improvements, and, maintain, and inspect range improvements including fences, corrals, pipelines, wells, windmills, water delivery systems, troughs, and earthen tanks, and any other range improvements. Travel is authorized using a pickup, trailer, ATV, UTV, or motorcycle to maintain or inspect improvements, and heavy equipment including a backhoe, dozer, loader, etc. to construct new improvements and to maintain improvements. This use, if authorized, could occur in any part of the allotment outside of the designated Salt River Canyon Wilderness area. A Minimum Tools Analysis and authorization will be applied for from the Regional Forester for motorized equipment use in the Salt River Canyon Wilderness. If approved constructing and maintaining new range improvements within the Wilderness using vehicles and equipment may also be approved.

Repeated tracking by motor vehicles can directly impact soil by removing the protective vegetation layer to bare soil and loosening soil aggregates through tire churning, rutting and soil displacement thus exposing the soil to accelerated erosion resulting in loss of soil productivity. The impacts are most pronounced during periods when the soil is wet. Motor vehicle use indirectly causes accelerated erosion and sediment transport to connected streams following storm events. Repeated motor vehicle travel on soils with moderate or high erosion risk is most likely to cause accelerated erosion, runoff and sediment delivery into connected stream courses, posing a risk to long-term soil productivity. On soils with slight erosion risk, the direct impact of motorized vehicle activity is lower but could cause a loss of soil productivity when vegetative ground cover is removed, soil is compacted, or rutting occurs. Off-road travel would occur on a very limited basis, dispersed in time and space, and areas of high erosion risk and traveling when the soil is wet can be avoided. As such, risks to soils from this activity would be expected to be minor and short-term (Hicks-Pikes Peak Allotment Soils Report).

Because effects from permittee authorized off-road travel on soils and watersheds are expected to be minor and short term, indirect effects from off-road travel on flycatcher CH can also be expected to be small, localized and infrequent.

Off-road travel is not anticipated to occur in Upper Salt River or Pinal Creek floodplains or riparian habitats on forest service lands; therefore direct effects from off-road travel on individual flycatchers is not expected to occur.

## Cumulative Effects - Flycatcher

Cumulative effects include effects of future State, tribal, local, and private actions, not involving a Federal action, which are reasonably certain to occur within the action area of the federal action. We found one future activity within the action area that is reasonably certain to occur.

Cumulative effects are expected to occur on a 40-acre parcel of private land at Horseshoe Bend that is within the project action area and includes riparian habitats along the Salt River. This parcel is leased by the Hicks-Pikes Peak grazing permittee and its infrastructure and uses were described previously. One action has been observed and is expected to occur in this area, upstream, and a few other sites within the action area. At these sites recreationists, primarily people fishing, and day users, leave trash, which could attract cowbirds (similar to a campground). During the baseline period, trash accumulations were moderate within small areas near Horseshoe Bend, upstream, and near Coon Creek and Redmond Wash. Current trash accumulations at Horseshoe Bend are small, and future accumulations are uncertain and will depend on future recreation use levels, increasing if recreation use increases. Cumulative effects on flycatcher critical habitat will be discussed in the critical habitat section below.

## Determinations for the Southwestern Willow Flycatcher

We have determined that the proposed action on the Hicks-Pikes Peak allotment May affect, but is not likely to adversely affect the southwestern willow flycatcher because:

- The effects of cowbird parasitism on flycatchers from implementing the proposed actions are expected to be small because livestock will not graze within the Lower Shute Springs and Ortega pastures adjacent to flycatcher habitat during cowbird critical season (May through July) as described in (USFS 2015), {Table 7a, b, and Supplemental Map 3}.
- Livestock will be present within between 400-600 meters km of Pinal Creek territories during the month of May, but not June or July. Any effect is anticipated small and therefore insignificant because unlike habitats along the Upper Salt River, the landscape within and surrounding the Pinal creek territories is saturated with activities that attract cowbirds and they have been documented on many of the surveys documenting flycatchers on Pinal Creek. Cattle are expected to be scattered throughout adjacent forest pastures, not concentrated near the private-forest boundaries.
- Livestock grazing will be excluded from flycatcher habitat eliminating most direct effects; effects associated with damaged fences or fences needing added segments or additional design features are anticipated to be insignificant because they would affect small areas, be short-term, and correctible.
- Indirect watershed effects are expected to be small because grazing use thresholds would provide a residual layer of vegetation to protect soils and reduce erosion and sedimentation.
- Pastures rested or deferred from grazing will provide additional vegetation cover to protect soils from grazing related erosion and sedimentation.
- Adaptive management would be implemented on uplands adjacent to flycatcher habitats to maintain and improve watershed conditions (see responses to monitoring, Table 14).
- Grazing exclusions reduce indirect watershed effects by contributing to resilient conditions within the floodplain and flood-prone areas enabling rapid recovery from any grazing related erosion and sedimentation.
- Grazing related erosion and sedimentation is expected to be a small part of overall erosion and sedimentation. It is not expected to alter the natural flow regime, or measurably alter river functions such as periodic flooding or processing sediment loads in the action area.

# Southwestern Willow Flycatcher Critical Habitat

## Critical Habitat Description

We depict CH within the project area in Map Appendix, Map 1. Critical habitat within the Tonto NF is within the Gila Recovery Unit. Within this recovery unit, there are seven management units, two of which occur on Tonto NF. The project action area is within the Roosevelt Management Unit, Salt River Reach, located upstream from Roosevelt Lake. It extends from approximately the State Route 288 Bridge over the river upstream to the confluence of the river and Cherry Creek. The southern portion of the Verde Management Unit consisting of about 3,300 acres is also within Tonto NF, but is located along the Verde River near Horseshoe and Bartlett Reservoirs north and west of Phoenix.

Flycatcher CH was most recently designated in 2013 (USFWS 2013). Earlier CH proposals and designations occurred in 2005 and 1997. Critical habitat within the action area generally occurs within the floodplain or flood-prone areas of the River. The Salt River CH segment along with a segment along Tonto Creek are the only designated segments on Tonto NF within the Roosevelt Management Unit (USFWS 2012). The large riparian habitats downstream from the allotment within the Conservation Space of Roosevelt Lake, portions of Pinal Creek on private land, and an adjoining small area of the forest were originally proposed to be designated as Critical Habitat. Due to Salt River Project and Tonto NF management, and a flycatcher management plan on Pinal Creek private lands, these proposed areas were excluded from being designated as flycatcher CH in 2013. This section of the BA discusses factors affecting designated Critical Habitat in the action area along the Upper Salt River.

## Flycatcher Critical Habitat Environmental Baseline

Within the action area, approximately 1,170 acres of Critical Habitat occur along the Salt River within its 100-year floodplain and flood prone areas. Physical or Biological Features (PBFs) essential to the conservation of the species and which may require special management considerations or protection and resulting Primary Constituent Elements (Primary Constituent Elements) (PCEs) of Critical Habitat occur at Horseshoe Bend, Redmond Flat, Coon-Chalk, and Nail Creeks, and are anticipated to occur in unsurveyed areas along the River.

PBFs for the flycatcher include (a) Lower gradient streams, (b) a wide range of invertebrate prey, (c) flowing streams with a wide range of streamflow conditions that support expansive riparian vegetation, (d) elevated subsurface groundwater tables and appropriate floodplain fine sediments, (e) riparian tree and shrub species that provide cover and shelter for nesting, breeding, foraging, dispersing, and migrating flycatchers, and (f) a variety of riparian tree and shrub species. Resulting PCEs can be summarized as (1) Riparian Vegetation, and (2) Insect Prey Populations. Occupied and suitable CH currently occurs at Horseshoe Bend, Coon-Chalk Creek confluence areas and Redmond Flat. Habitat that appears to have the most potential to develop into suitable-occupied CH in the future is located near the confluences of the river with Cherry Creek, Nail Creek, and Shute Springs Creek. For the flycatcher

A mixture of FS biologists and contractors have conducted protocol and presence surveys throughout the action area, and while we detected flycatcher territories, the effort has not been conducted annually and over all habitats to know the specific distribution, abundance, and persistence of flycatcher territories.

**Table 7: Analysis of presence or absence of the primary constituent elements within southwestern willow flycatcher CH within the action area in the floodplain of the Upper Salt River. Primary constituent elements are expected to occur.**

<i>Primary constituent elements</i>	Present (functioning)	Present (at risk)	Not in action area
(1) Riparian vegetation. Riparian habitat along a dynamic river or lakeside, in a natural or manmade successional environment (for nesting, foraging, migration, dispersal, and shelter) that is comprised of trees and shrubs (that can include Gooddings willow, coyote willow, Geyer’s willow, arroyo willow, red willow, yewleaf willow, pacific willow, boxelder, tamarisk, Russian olive, buttonbush, cottonwood, stinging nettle, alder, velvet ash, poison hemlock, blackberry, seep willow, oak, rose, sycamore, false indigo, Pacific poison ivy, grape, Virginia creeper, Siberian elm, and walnut) and some combination of:	X		
(a) Dense riparian vegetation with thickets of trees and shrubs that can range in height from about 2 to 30 m (about 6 to 98 ft.). Lower-stature thickets (2 to 4 m or 6 to 13 ft. tall) are found at higher elevation riparian forests and tall-stature thickets are found at middle and lower-elevation riparian forests;	X		
(b) Areas of dense riparian foliage at least from the ground level up to approximately 4 m (13 ft.) above ground or dense foliage only at the shrub or tree level as a low, dense canopy;	X		
c) Sites for nesting that contain a dense (about 50 percent to 100 percent) tree or shrub (or both) canopy (the amount of cover provided by tree and shrub branches measured from the ground);	X		
(d) Dense patches of riparian forests that are interspersed with small openings of open water or marsh or areas with shorter and sparser vegetation that creates a variety of habitat that is not uniformly dense. Patch size may be as small as 0.1 ha (0.25 ac) or as large as 70 ha (175 ac).	X		
(2) Insect prey populations. A variety of insect prey populations found within or adjacent to riparian floodplains or moist environments, which can include: flying ants, wasps, and bees (Hymenoptera); dragonflies (Odonata); flies (Diptera); true bugs (Hemiptera); beetles (Coleoptera); butterflies, moths, and caterpillars (Lepidoptera); and spittlebugs (Homoptera).	X		

**Southwestern Willow Flycatcher Critical Habitat Effects Analysis**  
*Grazing Authorization (Direct Effects)*

PCE 1 (a-d) Riparian vegetation. Cattle have the potential to browse riparian shrubs and young trees along the Salt River floodplain. Consumption of riparian shrubs and young trees results in changes in plant structure and reduction of plant diversity and density (Bock, 1992). In addition, livestock can damage or destroy riparian habitat

by bedding, trampling, and trailing through it. Livestock trailing through dense riparian vegetation could reduce canopy coverage in habitat flycatchers' use for nesting.

Livestock grazing in riparian areas can compact soil, reduce infiltration, increase surface runoff, accelerate erosion and sedimentation contributing to removal of organic material due to reduction in plant vigor and density (Verde Natural Resources Conservation District, 1993). These impacts result in increased susceptibility to destruction of a riparian area during heavy flow events. Consequently, these effects could reduce the number, size, or density of patches of riparian vegetation.

(2) Insect prey populations. The presence of livestock in riparian habitats may remove vegetative cover, which could reduce perching spots or protective areas for insects. Certain groups of insects feed on vegetation including leaves, branches, litter, nectar, and sap. Livestock may also cause riparian areas to become dryer because of trampling, trailing, compacting soils and drinking from small pools and ponds in floodplain backwaters. This may have effects on insect prey populations because some insects in and near riparian habitats have an aquatic life cycle stage such as caddisfly species, or consume water such as some bees and wasps.

Although grazing exclosure sizes in the proposed action are 22,000 acres smaller than existing (2005) exclosures, grazing will continue to be excluded from Upper Salt River flycatcher critical habitats. Therefore, direct effects on PCE's are not expected to occur if drift fences successfully exclude the river critical habitats from grazing, and monitoring, and responses to monitoring are frequent enough, and result in timely removal of livestock from critical habitat.

#### ***Consequences of livestock management activities on Flycatcher Critical Habitat on private land at Horseshoe Bend***

Potential consequences caused by the proposed action on the 40 acre parcel of private land leased by the grazing permittee to assist in managing the Ortega and Lower Shute Springs pastures could include those described above for PCEs 1 & 2, which in summary damages or removes critical habitat. The critical habitat within the private parcel consists of ½ stream mile of riparian habitats and is 2.5% of the action area stream miles (19 mi). These potential consequences will be eliminated or minimized because the grazing permittee will add, modify, and maintain fences, which will keep cattle on upland portions of the private land (approximately 30 acres), and outside the riparian habitats, which have physical and biological features and primary constituents elements of flycatcher critical habitat.

#### ***Grazing Authorization (Indirect Effects)***

Grazing on uplands and upland tributaries above riparian habitats along the Salt River may reduce the layer of vegetation protecting soils and increase erosion and sedimentation into flycatcher critical habitats on the river floodplain. These potential effects could decrease riparian vegetation density and its suitability as flycatcher habitat. Upland grazing can also indirectly affect floodplain habitat features by altering runoff patterns, decreasing soil water holding capacity, increasing water table depth, decreasing surface flows, and increasing aridity of the floodplain. Trampling, trailing, and removing vegetation from tributaries draining into critical habitat on the river floodplain can also cause increasing erosion and sedimentation into CH resulting in similar effects near where tributaries enter the river. These confluence areas along the river frequently support habitats for flycatchers and many other riparian and aquatic species.

Potential effects described above would be reduced by managing grazing within light to moderate vegetation use thresholds (30-40%), which provides a protective layer of residual vegetation in the uplands to slow runoff, reduce erosion and sedimentation, and maintain soil condition and watershed health.

Grazing in riparian areas and desert washes (ephemeral streams) tributary to CH along the river would occur within allowable use thresholds of 6-8 inches of stubble height of riparian herbaceous species, and 50% leaders browsed on woody riparian plants. Pastures adjacent to CH would also be rested or deferred from grazing as part of the

allotments rotational grazing system. Ortega and Lower Shute Springs pastures would not be grazed during May, June, and July to minimize effects from cowbird parasitism.

Although small amounts of indirect watershed effects are anticipated to occur, the primary impact from livestock grazing (on flycatcher habitat) is their feeding in and on riparian habitats (USFWS 2014).

### ***Water Developments***

There are five water developments with approximately 15 new water troughs on slopes draining into flycatcher CH. They include W2, AW24, AW33, AW34, and AW36 (Map Appendix).

Water developments are not expected to cause direct effects because none occurs within CH on the river floodplain.

Indirect effects from water developments can be both positive and negative. Strategically placed water developments can contribute to distributing livestock throughout a landscape and attract them away from CH on the river. However, placing new waters in areas that have received little use may cause new areas of heavy use (McAuliffe 1998). This may increase erosion and sedimentation. Nearest troughs to CH are W2 (0.7km), AW33 (0.8km), AW34 (1km), and AW36 (1.2km) as mapped, but locations are approximate. Removing water from springs and streams will also reduce water available for stream channel and riparian area recovery.

### ***Fencing***

Riparian Vegetation PCE 1 (a-d). The purpose of constructing and maintaining drift fencing along the river in the East and West Ortega and Lower Shute Springs pastures is to prevent cattle from accessing the Salt River, but does not establish a new allotment boundary. Fences will also prevent cattle from browsing and grazing within CH along the river floodplain. The floodplain and associated riparian and aquatic habitats are CH for three federally listed species. However, constructing fences close to CH may cause cattle to trail along the fence line seeking water. This could potentially occur along fence segments AF4 and F2. Livestock trailing along fence lines can cause local erosion and sedimentation.

### ***Herding***

Herding livestock out of willow flycatcher CH could negatively impact riparian vegetation (PCEs 1(a-d) by trampling and trailing through it. If monitoring and removing livestock from grazing exclosures, and checking fences and gates occurs frequently, herding is expected to be a small, infrequently occurring effect.

### ***Off-Road Travel***

Effects of off-road motorized travel outside of wilderness are discussed earlier in effects on the species and can be summarized as follows. Indirect effects to critical habitat could include operating vehicles and equipment removing the vegetative layer protecting soils resulting in accelerated erosion and sedimentation. These effects can be anticipated to be small, short-term, localized increases in erosion. If a Minimum Tools Analysis authorizes heavy equipment and motor vehicle use to construct and/or maintain and monitor range improvements in wilderness this may cause detectable increased erosion and sedimentation effects on critical habitat PCEs. The District should notify USFWS and determine whether reinitiating consultation would be necessary.

There would be no direct effects from off-road travel on CH because it would not be authorized within CH along the river.

## **Cumulative Effects – Flycatcher Critical Habitat**

Cumulative effects include effects of future State, tribal, local, and private actions, not involving a Federal action, which are reasonably certain to occur within the action area of the federal action. We found one future activity within the action area that is reasonably certain to occur.

There is a 40-acre private parcel at Horseshoe Bend that is within the project action area and includes riparian habitats along the Salt River for approximately ½ stream mile (2.5% of action areas 19 stream miles). The current grazing permittee leases this parcel and uses it to assist with managing nearby pastures on the Forest allotment.

There are effects from OHVs entering the private land parcel, and subsequently OHV users pioneer routes onto adjacent Forest critical habitat. A variety of types of vehicles drive through the riparian vegetation to get to or near the edge of the Salt River primarily to fish along the river. These activities result in damaging and eventually removing riparian vegetation. Vehicles eventually create “windows” along the river where little or no riparian vegetation remains. These effects are reduced when permittees repair or upgrade fencing, but are anticipated to continue throughout the consultation period.

## **Determinations for the Southwestern Willow Flycatcher Critical Habitat**

We have determined that the proposed actions on the Hicks-Pikes Peak allotment May affect, but is not likely to adversely affect southwestern willow flycatcher critical habitat because:

- Livestock grazing will be excluded from critical habitat. Drift fences will be constructed and tied into steep terrain features to prevent livestock from accessing critical habitat along the Salt River. The 2014 flycatcher status review stated that the primary impact from livestock grazing is the feeding within and upon riparian habitats (USFWS 2014).
- New upland areas proposed for grazing upslope from flycatcher critical habitat will be managed within allowable use thresholds described in the proposed action. These thresholds are similar to grazing guidelines in Table 2 of Appendix G in the Southwestern Willow Flycatcher Recovery Plan. Allowable use thresholds provide residual vegetation, which leaves a protective layer of vegetation to reduce indirect watershed effects. Resting or deferring pastures upslope from flycatcher habitats can also be anticipated to reduce indirect watershed effects, as can adaptive management when it is used to minimize effects to critical habitat.
- Although increased erosion and sedimentation is anticipated to occur because of implementing the proposed actions, the effects are anticipated to be small because the critical riparian habitats remain excluded from grazing, and adjacent uplands will be managed to reduce grazing related increases in erosion and sedimentation as described above.
- Soils upslope and within critical habitat are primarily granitic and highly erosive. Existing erosion and sedimentation is visually observable and could be the remaining consequences of past management actions. Any grazing related watershed effects would not be detectable from existing erosion and sedimentation likely caused by naturally erosive granitic soils and compounded by historic management practices discussed earlier in this document and in the EA.
- The Upper Salt River within and upstream from the action area is a free-flowing and un-dammed segment of the river. It routinely reaches flows of from 10,000 to 16,000+ cubic feet per second with peak flows of more than 81,000 cfs. The river would readily process any small increases in erosion and sedimentation contributed by grazing actions. Grazing related increases in erosion and sedimentation would not be anticipated to affect PCEs.

## **Western Yellow-Billed Cuckoo (*Coccyzus americanus*)**

*(Western Distinct Population Segment)*

ESA Status:

Threatened, October 3, 2014

Forest Occurrence:

Tonto, Apache-Sitgreaves, Cibola, Coconino, Coronado, Gila,

Recovery Plan: Prescott, and Santa Fe,  
Critical Habitat: No  
Proposed

*Portions of the following analyses for the Yellow-billed cuckoo, Narrow-headed garter snake, and Razorback sucker critical habitat are summarized from the Framework for Streamlining Consultation on Livestock Grazing Activities (USFS 2015), which is herein incorporated by reference. Site-specific information is added to range-wide information from the Framework.*

### Life History and Habitat

The yellow-billed cuckoo is a Neotropical migrant bird that breeds in North America and winters in South America. Typically a secretive and hard-to-detect bird, mating yellow-billed cuckoos have a distinct call. Little information exists on the lifespan for the yellow-billed cuckoo. The oldest known record of a banded bird is eight years (S. McNeil, Southern Sierra Research Station, personal communication to S. Sferra, USFWS, July 16, 2015).

In the Southwest, the western yellow-billed cuckoo (WYBC or cuckoo) usually occurs in association with large blocks of mature riparian cottonwood-willow woodlands and dense mesquite associations. However, recent survey efforts in Madrean oak and pine-oak woodland, juniper woodland, and dense Sonoran Desert scrub have documented WYBC breeding in these atypical vegetation types. This species is historically known from parts of the 12 states west of the continental divide including: Arizona, New Mexico, Texas, California, Nevada, Colorado, Washington, Oregon, Idaho, Utah, Montana, and Wyoming. Cuckoos can travel over 1.6 km (1 mile) a day within their home ranges, including in adjacent upland foraging habitat (Sechrist et al. 2012). The average greatest distance traveled seasonally is 1.5 km (0.9 miles). The greatest distance traveled by an individual seasonally is 3.2 km (2.0 miles).

### Distribution

A full list of rivers and population size of each location is listed in the proposed listing of the species in Arizona and New Mexico. In Arizona, WYBC was historically widespread and locally common on the lower Colorado River and its five major tributaries. A WYBC population greater than ten pairs is found on 12 locations in Arizona including the Gila River, Verde River, Bill Williams River, Colorado River, San Pedro River, Santa Cruz River, and Agua Fria River and their tributaries. Sites with smaller populations are found at locations including the Roosevelt Lake Complex, Pinal Creek, Upper Tonto Creek, Pinto Creek, Oak Creek, Bonito Creek, and Babocomari River, Granite Creek, Mimbres River, and many canyons in the Coronado National Forest. Many additional occupied areas may be found as cuckoo surveys are completed. In Western New Mexico, the WYBC were historically common along portions of the Rio Grande, Gila, San Francisco, and San Juan Rivers.

### Critical Habitat

The USFWS proposed CH for the WYBC on August 14, 2014 (79 FR 48548). There are 80 CH units proposed in nine western states; in Arizona, there are 37 units, and 3 additional units within Arizona and bordering states. There are nine units on the Tonto NF, and three units on the Globe Ranger District.

### Recovery Status/Needs

A full description of the WYBC life history requirements and threats is presented in Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (*Coccyzus americanus*); Final Rule (USFWS 2014b), and is herein incorporated by reference.



## Status and Effects within the action area

### Status Overview

Surveys indicate that there is potentially suitable habitat along the Salt River in the vicinity of Horseshoe Bend and Redmond Flat. A small portion of Pinal Creek within the allotment is part of PCH Unit AZ 15 and is within 2 kilometers of occupied PCH upstream on private lands. There is also habitat along Pinal Creek downstream on Forest Lands that provides connectivity between occupied PCH on Pinal Creek and occupied PCH at Roosevelt Lake and Tonto Creek. Sycamore Canyon, which drains into the Salt River at Horseshoe Bend was surveyed in 2016 and determined not to be suitable or potentially suitable cuckoo habitat.

### Effects overview

The effects from habitat loss or degradation from agricultural activities such as livestock grazing in riparian areas include declines in the structural richness of the vegetative community in riparian areas, change of understory vegetation community, reduction in habitat connectivity, and reduction in habitat patchiness across the species range in the Southwestern landscape. The relatively cool, damp, and shady areas favored by WYBC are also favored by livestock. Removal, reduction, or modification of cattle grazing has resulted in increases in abundance of some riparian bird species (Krueper 2003). Indirect watershed effects may also occur as a result of grazing and can include increases in erosion and sedimentation, increases in depth to water table, and drying of the floodplain. Proposed CH for the WYBC is similar to that of the southwestern willow flycatcher CH in some areas, and there is considerable overlap of the two in some locations. Therefore, the effects described in the southwestern willow flycatcher section would be similar for the cuckoo. As stated in the 2014 status review of the flycatcher (USFWS 2104), “The primary impact from livestock grazing is the feeding in and on riparian habitats”. However, WYBC are also found breeding in more arid riparian areas, mesquite stands, and in Madrean evergreen woodlands of the Sky Islands and foraging in adjacent upland habitat.

Direct effects on cuckoos or habitat would not be anticipated at any of the following sites because livestock will not be allowed to access the Salt River or Pinal Creek floodplain and riparian habitats. This would allow seedlings and saplings to continue to progress toward maturity as suitable nesting sites (79 FR 59992, October 3, 2014).

### Horseshoe Bend vicinity and Effects

Cuckoo surveys were conducted in 2016 throughout Sycamore Canyon to determine cuckoo occupancy and estimate habitat quality. No cuckoos were detected in 2016. Potentially suitable habitat for cuckoos is limited within Sycamore Canyon due to impacts including past and ongoing grazing effects and road related effects from Forest Road 219 and its use and maintenance. Surveyors identified potential habitat for the cuckoo along the river in a few large patches of habitat upstream and downstream from Sycamore Canyon, but not within Sycamore Canyon or where it flows into the river. Patches identified as potentially suitable were primarily riparian tamarisk thickets with a few inclusions of native cottonwood-willow vegetation adjacent to upland mesquite. There are additional patches of similar vegetation across the river in older floodplains and channels, which are no longer active. These patches may be potentially suitable, but they are currently on the floodplain terrace, lack a tree overstory, and the cool, damp, and shady areas favored by cuckoos (79 FR 59992, October 3, 2014). In this area most of the larger stands apparently capable of attracting cuckoos and described as potential habitat occur on the north side of the river, which is on another allotment and is not currently grazed. These stands where they border the river appear more suitable for flycatcher nesting than for cuckoos, and at least one stand is occupied with a flycatcher territory. Occupied cuckoo habitats near the action area along Pinal Creek, Coon Creek, at Roosevelt Lake, and Rockhouse farm all occur in cottonwood-willow woodland habitats as described earlier. Cuckoos on the Globe and Tonto Basin Districts of the Tonto NF have yet to be found in more arid riparian habitats or woodlands similar to where they are found in more southern parts of Arizona.

Placing up to 300 cows in East or West Ortega pastures for the proposed grazing periods may result in indirect watershed effects that may slow further development of any potential cuckoo habitat due to increased erosion and sedimentation, and effects on the floodplain similar to those described for the flycatcher. These effects would be reduced by adhering to vegetation use thresholds, monitoring, and responses to monitoring, resting and or deferring use of pastures, and adaptive management.

### Upper Salt River, vicinity of Redmond Flat, and Effect

Cuckoos have been observed in this area in the breeding season while conducting flycatcher surveys. The habitat at Redmond Flat has been developing since approximately 2000 and is connected with habitat across the river in the Coon-Chalk Creeks area. Flycatchers use both sides of the river simultaneously in this area, but they are easier to observe than cuckoos, and cuckoo use of these stands is uncertain. Habitat in the vicinity of Redmond Flat has not been evaluated, but there is some element of a tree overstory with at least a few large cottonwoods, and a midstory of mixed riparian shrubs including tamarisk, willow, and cottonwood, and therefore is likely potentially suitable habitat. Riparian habitats on the north side of the river on the neighboring allotment were surveyed in 2016 and no cuckoos were detected near the confluence of the river with Coon Creek. However, cuckoos have been detected between Coon and Chalk Creeks during flycatcher surveys conducted during some years from 2007-2017. In 2016 a cuckoo possible breeding territory was documented in the vicinity of Coon Creek Spring approximately 1.5 miles upstream from the action area along Coon Creek. Cuckoos may be using stands of vegetation in the vicinity of Redmond Flat, Coon, and Chalk Creeks together as one breeding/foraging territory.

Indirect watershed effects resulting from livestock grazing could potentially occur where there is potentially suitable or unsurveyed habitat along the river floodplain in the vicinity of Redmond Flat. Any potential effects such as erosion and sedimentation are expected to be minor because the Redmond Flat drift fence (AF4) would be constructed beyond the Salt River floodplain. Even if the fence was constructed immediately beyond the floodplain boundary, we anticipate that indirect watershed effects would be small because river riparian habitats would remain excluded from grazing and it is anticipated that there would still be sufficient residual upland vegetation to reduce indirect grazing effects. Vegetation use thresholds and deferred/rest rotation grazing will also contribute to minimizing effects of grazing upslope from riparian habitats along the river in the vicinity of Redmond Flat.

### Pinal Creek and Effect

A small amount of proposed CH Unit AZ-15 is located within the allotment and is discussed in the CH sections below. Downstream from AZ-15, Pinal Creek continues to flow through the allotment for 6-7 kilometers to where it meets the Upper Salt River. This habitat, however, is unlikely to be suitable cuckoo breeding habitat because it is a steep canyon bound stream segment as opposed to the description of breeding habitat as along low gradient (surface slope less than 3 percent) rivers and streams, and in open riverine valleys that provide wide floodplain conditions [greater than 325 ft. (100 m)] {79 FR 48548}. It is likely important for dispersal and movement because it connects proposed CH Unit AZ-15 upstream along Pinal Creek with Units AZ-29 and AZ-14 in the vicinity of Roosevelt Lake. All of these proposed CH units are being considered for possible exclusion from being designated as CH under the final rule because they are managed under a private land management plan upstream, and the Roosevelt Lake HCP downstream and both plans manage for conservation of cuckoos and flycatchers along with other land and water management considerations.

Indirect watershed effects from grazing may occur in this segment of Pinal Creek from livestock grazing within 100-200 meters of the floodplain in some locations. These effects will be minimized by adhering to vegetation use thresholds, monitoring, and responses to monitoring, resting and or deferring use of pastures, and adaptive management.

## **Livestock Management Practices – Yellow-billed Cuckoo**

Effects of allotment management are similar for listed species and critical habitats in the Action Area because they occur in similar riparian and aquatic habitat areas. They are summarized as follows and a more detailed discussion can be found in the flycatcher allotment management practices section.

Constructing and maintaining range improvements such as water developments and fences can cause indirect effects that result primarily in locally increased erosion and sedimentation. These effects are minimized by practices that treat areas where vegetation has been removed exposing soils. Improvements may increase grazing in previously lightly used areas, but also create heavily used areas within approximately 400 meters of a new development. Effects from constructing and maintaining improvements are anticipated to be minor, localized, temporary disturbance to soils, as presented in the project EA.

The grazing permittee may be authorized to travel off-road in a variety OHVs, vehicles, and heavy equipment to construct, maintain, and inspect range improvements. Effects of these types of actions are primarily direct impacts to soils removing the protective vegetation layer thereby causing accelerated erosion and sediment transport to connected streams during and following storms. The resulting effects to the Yellow-billed cuckoo and its habitats are anticipated to be small, localized, and infrequent because off-road travel would occur on a very limited basis, dispersed in space and time, avoiding areas of high erosion risk, and traveling when soil conditions are dry, as presented in the project EA.

Direct effects from livestock management practices will not occur because improvements and off-road travel will not occur within Upper Salt River and Pinal Creek floodplains.

## **Cumulative Effects – Yellow-billed Cuckoo**

Cumulative effects include effects of future State, tribal, local, and private actions, not involving a Federal action, which are reasonably certain to occur within the action area of the Federal action. We found one future activity within the action area that is reasonably certain to occur.

There is a 40 acre private parcel at Horseshoe Bend that includes riparian habitats along the river for approximately ½ mile (2.5 % of the action areas 19 stream miles). This parcel is leased by the grazing permittee and appears is used to assist in managing nearby portions of the Forest allotment. There may be effects from livestock and livestock management activities on riparian habitats within this parcel. There could be effects from OHV use on the private lands, and pioneering routes onto adjacent forest riparian habitats, which have been described as potentially suitable for Yellow-billed cuckoo. The river can also be crossed by OHVs at low water, creating the potential for effects on riparian habitats on the north side of the river during some years. Vehicles drive through riparian vegetation to get to or near the Salt River primarily to fish along the river. These activities result in damaging and eventually removing riparian vegetation. Vehicle eventually create “windows” along the river where little or no riparian vegetation remains. These effects are reduced when permittees repair or upgrade fencing, but are anticipated to continue throughout the consultation period. Habitats described as potentially suitable for the yellow-billed cuckoo may be affected, but affected areas are expected to be small. Cuckoo surveys were conducted in this vicinity in 2016 and cuckoos were not detected.

## **Proposed Critical Habitat Status and Effects**

A small portion (30 acres, 7%) of Proposed Critical Habitat Unit AZ-15 is located within the action area along Pinal Creek. The remainder of this unit (389 acres) is on private property, owned and managed by a mining company. The 30 acres of forested land within the action area is on the downstream end of AZ-15, and on the last Tonto staff site visit in 2011 it appeared to be suitable habitat. No formal surveys were conducted and cuckoos were not heard during our visit from the private-district boundary 6-7 kilometers downstream to where Pinal Creek flows into the river. The best habitat is upstream on the private land, which has been consistently occupied by cuckoos during the breeding season in recent years. In 2017 a Probable cuckoo breeding territory was documented on private mining property upstream within AZ-15 (Freeport 2012, Freeport 2018).

The following are the specific elements of the physical or biological features that provide for WYBC life history processes and are essential to the conservation of the species (USFWS 2013, 2014):

#### *Primary Constituent Elements (PCEs) for Proposed Critical Habitat*

- *PCE 1: Riparian woodlands.* Riparian woodlands with mixed willow cottonwood vegetation, mesquite-thorn forest vegetation, or a combination of these that contain habitat for nesting and foraging in contiguous or nearly contiguous patches that are greater than 325 feet (100 meters) in width and 200 acres (81 hectares) or more in extent. These habitat patches contain one or more nesting groves, which are generally willow-dominated, have above average canopy closure (greater than 70 percent), and have a cooler, more humid environment than the surrounding riparian and upland habitats.

#### **PCE 1 Effect**

There are existing fences around the 30 acre portion of the unit on the allotment. The remainder of the unit (389 acres) is on private lands and there is a cross fence at the forest-private boundary on the downstream end of the Unit. Cattle will not have access to the forest portion of AZ-15 under the proposed action. There should be no direct effects because grazing will not occur in the 30 acres located on the allotment. Small indirect watershed effects including minor grazing related erosion and sedimentation can be anticipated, but they should be limited because there is a sufficient protective vegetation layer within the fenced area to reduce any grazing related increases in erosion and sedimentation. Grazing within utilization thresholds, monitoring, and responses to monitoring can also be expected to limit increases in erosion and sedimentation from grazing on the surrounding landscape, by leaving residual vegetation.

- *PCE 2: Adequate prey base.* Presence of a prey base consisting of large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, dragonflies) and tree frogs for adults and young in breeding areas during the nesting season and in post-breeding dispersal areas.

#### **PCE 2 Effect**

Within the forest portion of AZ. Unit 15, there should be no grazing related direct effects to PCE 2, and only small grazing related indirect effects because of the exclusions, measures, and conditions described in PCE 1 effect above.

- *PCE 3: Dynamic riverine processes.* River systems that are dynamic and provide hydrologic processes that encourage sediment movement and deposits that allow seedling germination and promote plant growth, maintenance, health, and vigor (e.g. lower gradient streams and broad floodplains, elevated subsurface groundwater table, and perennial rivers and streams). This allows habitat to regenerate at regular intervals, leading to riparian vegetation with variously aged patches from young to old.

#### **PCE 3 Effect**

There should be no grazing related direct effects to the forest portion of AZ. Unit 15 along Pinal Creek because it is excluded from grazing. Riverine processes are hydrologically altered upstream by the water treatment program as discussed in the flycatcher sections; however, these alterations may have contributed to increasing the size and vegetation development of Unit AZ-15 and contribute to its habitat suitability by providing a more consistent permanent water source throughout the unit, and to downstream habitats. This supplemental water source contributes to plant growth, maintenance and habitat quality in a somewhat similar manner to Salt River Project's Rockhouse habitat restoration site approximately 10 miles downstream near Roosevelt Lake.

## Cumulative Effects – Yellow-billed Cuckoo Critical Habitat

Cumulative effects include effects of future State, tribal, local, and private actions, not involving a Federal action, which are reasonably certain to occur within the action area of the Federal action. We found no activities within the action area that are reasonably certain to occur during the consultation period, and would have effects on the forest portion of Yellow-billed cuckoo CH Unit AZ-15 along Pinal Creek. The mining related water treatment program affecting Pinal Creek is described in the flycatcher Environmental Baseline.

### Western Yellow-Billed Cuckoo Determination

Guidance and criteria from the 2015 *Framework for Streamlining Grazing Consultations* (USFS 2015) were used to evaluate effects to Yellow-billed cuckoos from the proposed action of authorizing livestock grazing and associated livestock management practices.

We have determined that the proposed action on the Hicks-Pikes Peak allotment May affect, but is not likely to adversely affect the Yellow-billed cuckoo because:

- Grazing as described in the proposed action will not occur in the floodplain of the Upper Salt River or Pinal Creek which are the only potentially suitable or suitable habitats remaining on the allotment. Riparian habitats along the river and Pinal Creek are excluded from grazing in the proposed action.
- Uplands associated with the river and Pinal Creek would be managed at allowable use thresholds in the proposed action, which are similar to descriptions in Table 2 of Appendix G in the Southwestern Willow Flycatcher Recovery Plan, but do not include as extensive of stubble height guidelines.
- Indirect watershed effects at Redmond Flat will be minimized because the drift fence at Redmond Flat (AF4) will be constructed beyond the Salt River Floodplain. We anticipate that drift fences constructed at this location will provide a sufficient protective layer of residual vegetation to minimize indirect watershed effects from upland grazing. However, the fence constructed in the approximate location as mapped (Figure 2) would provide much more conservation and recovery value for the threatened and endangered species and their CHs in the action area.
- Other riparian habitats along the river such as riparian habitats where Nail Creek, or other tributaries flow into the river are too small (5-10 acres) to develop cuckoo nesting habitats, and appear most likely to develop into mixed midstory habitats more suitable for nesting flycatchers. They will remain excluded from grazing during the consultation period.
- Riparian habitats in the Horseshoe Bend vicinity identified as potential cuckoo habitat currently lack features of nesting habitat including elevated groundwater tables and high humidity, necessary to develop into suitable cuckoo breeding habitat within the consultation period. These are currently dry mixed stands of mesquite and tamarisk on a floodplain terrace with a sparse, if any, overstory canopy. The largest of these stands is on the north side of the river on another allotment, where the floodplain and adjacent uplands are currently excluded from grazing.
- Riparian habitats along Pinal Creek downstream of PCH unit AZ-15 may be subject to indirect watershed effects from grazing on adjacent uplands. They are not anticipated to be cuckoo nesting habitat because they occur in a canyon with steep slopes where the width of riparian vegetation is less than 100 meters. Riparian areas with this type of structure are not generally used by nesting cuckoos (79 FR 48548). These habitats are most likely used by cuckoos for dispersing and moving between upstream and downstream proposed CH units, and for cover, shelter, and foraging. Indirect watershed effects including erosion and sedimentation can be anticipated in this stream segment; however, any damage to the existing tree canopy would be anticipated to be small. Effects to groundwater tables and high humidity along Pinal Creek

would also be anticipated to be small because consistent, permanent water is supplied to Pinal Creek by a well field upstream, and effects to an elevated water table and moist conditions would be temporary and expected to recover rapidly.

## Western Yellow-Billed Cuckoo Proposed CH Determination

Guidance and criteria from the 2015 *Framework for Streamlining Grazing Consultations* (USFS 2015) were used to evaluate effects to proposed Critical Habitat for the Western Yellow-billed cuckoo from the proposed action of authorizing livestock grazing and associated livestock management practices.

We have determined that the proposed action on the Hicks-Pikes Peak allotment May affect, but is not likely to adversely affect WYBC proposed CH because:

- Livestock grazing is excluded from the forest portion of critical habitat Unit AZ-15.
- Uplands associated with proposed CH unit AZ-15 are managed within allowable use thresholds in the proposed action, which are similar to descriptions in Table 2, No. 3 of Appendix G in the Southwestern Willow flycatcher Recovery Plan, but do not include as extensive of stubble height guidelines. These thresholds would provide a protective vegetation layer sufficient to reduce indirect effects such as erosion and sedimentation to the extent that they would not be detectable to PCEs.
- CH Unit AZ-15 on private land and occupied habitat on Coon Creek upstream from the Salt River outside the action area both have apparently nesting cuckoos in the presence of grazing. The WYBC surveys on private land in 2017 resulted in 16 detections with estimates of 14 unique birds and 4 probable breeding territories in habitats where there is seasonal grazing. The cuckoos on Coon Creek have a Possible nesting territory in the presence of what can be described as intensive grazing, but within a high quality multi-layered forest stand near a spring.

## Narrow Headed Garter Snake (*Thamnophis rufipunctatus*)

Endangered Species Act Status:	Threatened
Forest Occurrence:	Tonto, Gila, Apache Sitgreaves, Coconino, Prescott
Recovery Plan:	No
Critical habitat:	Proposed, July 10, 2013

The Narrow-headed garter snake was listed as threatened [79 FR 38678] on July 08, 2014. The USFWS also proposed critical habitat [78 FR 41550], but a final rule has not been published. A full description of threats to the Narrow-headed garter snake is presented in the USFWS's Endangered and Threatened Wildlife and Plants; Threatened Status for the Northern Mexican Garter snake and Narrow-headed Garter snake; Final Rule [79 FR 38678, and USDI 2014].

### Life History

The Narrow-headed garter snake (garter snake) is a live-bearing (viviparous) species. It is generally active from March to November. Areas of pool and riffle habitat containing cobbles and boulders are important for acquisition of prey. Sexual maturity occurs at two years of age in males and at two to three years of age in females. Mating is presumed to occur during the spring months followed by the live birth of between four and seventeen newborns from late July into early August.

The garter snake is highly aquatic as a function of its prey base where it forages under water on fish. It is strongly associated with clear, rocky streams, using predominately rocky pool and riffle habitat. Shoreline habitat with structural complexity, particularly shrubs and saplings, is important for thermoregulation (basking) near the water's edge.

Threats to the species rangewide include predation by non-native aquatic species including sunfishes, catfishes, brown trout, bullfrogs and crayfish; reduction or removal of prey base; ash flows from wildfire that remove the prey base or habitat for prey species; natural or anthropogenic dewatering of aquatic habitat; indirect effects from fisheries management activities; road construction, use, and maintenance; adverse interactions with humans; and livestock grazing in the presence of harmful nonnative species.

## Garter Snake Critical Habitat

There are 6 units proposed as critical habitat for the garter snake. All proposed critical habitat units are considered by USFWS to be occupied. Critical habitat units occur in 7 Counties in Arizona including Gila County, and 4 Counties in New Mexico.

Within these areas, the primary constituent elements of the physical or biological features essential to the conservation of the garter snake consist of the following four components:

1. Stream habitat, which includes
  - a. Perennial or spatially intermittent streams with sand, cobble, and boulder substrate and low or moderate amounts of fine sediment and substrate embeddedness, and that possess appropriate amounts of pool, riffle, and run habitat to sustain native fish populations;
  - b. A natural, unregulated flow regime that allows for periodic flooding or, if flows are modified or regulated, a flow regime that allows for adequate river functions, such as flows capable of processing sediment loads;
  - c. Shoreline habitat with adequate organic and inorganic structural complexity (e.g., boulders, cobble bars, vegetation, and organic debris such as downed trees or logs, debris jams), with appropriate amounts of shrub-and sapling-sized plants to allow for thermoregulation, gestation, shelter, protection from predators, and foraging opportunities; and
  - d. Aquatic habitat with no pollutants or, if pollutants are present, levels that do not affect survival of any age class of the garter snake or the maintenance of prey populations.
2. Adequate terrestrial space (600 ft. - 182.9 m) lateral extent to either side of bankfull stage) adjacent to designated stream systems with sufficient structural characteristics to support life-history functions such as gestation, immigration, emigration, and brumation.
3. A prey base consisting of viable populations of native fish species or soft-rayed nonnative fish species.
4. An absence of nonnative fish species of the families *Centrarchidae* (Sunfishes) and *Ictaluridae* (catfishes), bullfrogs (*Lithobates catesbeianus*), and/or crayfish (*Orconectes virilis*, *Procambarus clarki*, etc.), or occurrence of these nonnative species at low enough levels such that recruitment of garter snakes and maintenance of viable native fish or soft-rayed nonnative fish populations (prey) is still occurring.

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 on the effective date of this rule.

## Distribution

The garter snake is known from many streams draining the Mogollon Rim from central and eastern Arizona, and southeast to southwestern New Mexico at elevations ranging from 2,300 to 8,000 ft. in elevation (USDI 2014). The species is confined to Arizona and New Mexico, where it is found in streams of the Gila River Basin, including the Salt River, Tonto, Verde, and San Francisco sub basins that drain the Mogollon Rim, White Mountains, and Gila Wilderness areas. The species was likely not present in the lower reaches of rivers in these sub basins, even where perennial flows occurred (USDI 2014).

Garter snake population densities are significantly less than historical densities. Recently, the only sites where garter snakes are reliably detected are Oak Creek (AZ), Tularosa River (NM), and Middle Fork Gila River (NM). Several of these sites have been recently affected by wildfires. This species is believed to persist in viable numbers on the Gila and Coconino NFs. Several streams may also contain low numbers of garter snakes throughout these forests as well as the Tonto NF, however, vitality is questionable for these additional populations (See Final Rule for a list of current populations throughout range, USDI 2014).

## Status of the species in the Action Area

**Table 9: Formal consultations that have occurred from 2013 to present.**

Formal consultations on the Tonto NF from 2005 through 2018.					
Consultation #	Date of BO	Project	# of Individual snakes Anticipated Taken	Form of Take Anticipated	Critical habitat
22410-2006-F-0365-R3	5/24/18	Reinitiation Phase II Utility and Corridor, AZ	3	Injury or death	Adverse effects to proposed critical habitat, no adverse modification.
AESO/SE 02EAAZ00-2014-F-0313_R001	2/15/18	Reinitiation, 1985 Tonto NF LRMP	Not determined	Not determined	No adverse modification of proposed critical habitat.
AESO/SE 02EAAZ00-2014-F-0463	3/1/16	Tonto NF Travel Management Rule	2	Mortality or injury from vehicle strikes	No adverse modification of proposed critical habitat.

Proposed critical habitat for this species is present along the Salt River within the Lower Shute Springs and Ortega pastures; it extends from Pinal Creek to the upstream allotment boundary near Jump off Canyon, a distance of approximately 19 river miles. The extent of proposed critical habitat on Globe and Tonto Basin Districts extends along the river from the AZ. State Hwy. 288 Bridge upstream 48 miles to the forest boundary. There are additional proposed critical habitat streams upstream on non-forest and mixed ownership lands along the Salt River and several of its tributaries. Critical habitat in the action area is within the Upper Salt River Sub basin Unit, Salt River Subunit.

Garter snakes have not been detected in the Salt River within the action area since 1985 and subsequent surveys have been very sparse or have not occurred. This habitat is considered occupied, likely with a low-density population, which is not viable into the future (78 FR 41550; July 10, 2013). Individual garter snakes may occasionally disperse downstream toward the action area. The rule proposing critical habitat states that PCE 4 (absence of non-natives) in this subunit is deficient (78 FR 41550; July 10, 2013). The Upper Salt River including the action area was surveyed in 2004-2005 (Holycross *et al.* (2006) including a lower section of Pinal Creek near where it flows into the river and no garter snakes were detected. Native desert and Sonora suckers and round-tail chub were observed as were mosquito fish, green sunfish, common carp, fathead minnow, and red shiner. Crayfish were documented in Upper Salt River (Holycross *et al.* (2006) and Pinal Creek (Burger 2011). Holycross *et al.* (2006) concluded garter snakes were likely extirpated, or nearly so, from this historical locality.

In 2018, AZGFD conducted fish surveys along the river including 3 sites within the action area in the vicinity of Horseshoe Bend. Only non-native fish were captured according to the following summary: 413 red shiner and thousands of young of the year, 47 channel catfish, and smaller numbers of common carp (3), and green sunfish (2). Soft-rayed non-native fish captured include small numbers of mosquito fish (15) and fathead minnow (4).

Current overall habitat quality for the garter snake in the action area is anticipated to be low primarily due to a substantial presence of harmful non-native fish species in the river (PCE 4) and documented low levels/absence of a



native fish prey base in the river and low levels of soft-rayed non-native prey species (PCE 3). Physical features of habitat determined important for supporting PCEs include the river floodplain and associated tributaries, side channels, and backwater habitats. A relatively healthy, intact riparian area along with periodic overbank flooding in a generally natural pattern, is also important for maintaining PCEs necessary for long-term conservation of garter snakes, as well as their primary prey species (78 FR 41550; July 10, 2013).

The presence of large willows or shrubs growing along a shoreline or overhanging a stream channel appear to be important components of garter snake habitat along with rocky substrates and woody debris. Existing condition of these physical habitat components in proposed critical habitat in the action area appears to be relatively high habitat quality within a functioning river system. Existing condition of physical habitat components is based on evaluations of photographs of the river taken annually by river rangers, subsequent interviews and discussions, and visits to selected sites including Horseshoe Bend, Redmond Wash, and Redmond Flat. Increases in extent and improvements in riparian habitat condition such as reduced erosion along the river were anticipated when grazing was excluded and observations and recent photographs show increases in riparian vegetation along the river corridor. Proposed critical habitat on Forest Lands along the river have not been grazed by permitted livestock since approximately 2000 with the exception of some grazing that occurs when gates are left open and/or fences are not maintained. A lack of overall disturbance from grazing, combined with other factors including sediment deposition and seed germination following upstream wildfires, has resulted in growth and development of relatively high quality riparian habitats along segments of the river; however, tamarisk is the dominant riparian vegetation in most locations. Aquatic habitats in the river, however, remain dominated by harmful non-native fish, which prey on garter snakes and their fish prey. Crayfish are also present in the river.

## **Narrow Headed Garter Snake Effects Analysis**

The principal effect to the habitat of the garter snake has typically occurred as a result of indirect effects of historical or unmanaged grazing. Effects include losses or reductions of the fish prey base caused by a rise in water temperature to levels lethal to prey species, declines in the structural richness of the vegetative community; increased aridity of habitat; loss of thermal cover and protection from predators; and desertification. Studies on Western garter snakes (terrestrial) indicated abundance and biomass was significantly higher in areas that were excluded from grazing, where the streamside vegetation remained lush, than where unmanaged grazing was permitted (USFWS 2014). Excessive grazing in the uplands of watersheds occupied by the species may result in elevated levels of sedimentation in occupied streams affecting prey species and a garter snake's ability to hunt using visual cues. Managed grazing with limited utilization ranging from light use to moderate use (i.e., <30 % of key foraging species) of riparian vegetation could take place with no significant or measurable effects to the species, but should be less depending on current condition of the riparian zone (Holechek *et al.* 2004) and more focused on the status of any resident harmful nonnative species community. The higher the density of harmful nonnatives, the more sensitive the garter snake population is to other perturbations (e.g., livestock grazing).

Grazing on uplands draining into garter snake habitats along the Upper Salt River and potentially suitable habitats along Pinal Creek under the proposed action will be implemented using utilization thresholds, pasture rest and deferment, water developments to distribute livestock, and monitoring to minimize indirect effects such as sheet flow erosion and other watershed effects. Riparian habitats and a variable width of adjacent uplands along the Upper Salt River and Pinal Creek also continue to be excluded from grazing under the proposed action. This also eliminates or greatly reduces any potential for direct grazing effects such as trampling by livestock. It also contributes to minimizing indirect effects by providing areas where there is a protective layer of ungrazed vegetation. Some grazing will occur within the 600 ft. of terrestrial space portion of critical habitat near Horseshoe Bend and other areas of the Ortega and Lower Shute Springs Pastures depending on final grazing exclusion fence locations.

The natural flow regime, perennial/intermittent flow, and the presence of non-native aquatic species may be impacted by current allotment management such as stock pond management within allotment in Garter snake proposed critical habitat. Significant withdrawal of water from within an occupied watershed could result in measurable or significant impacts to the natural flow regime and the presence of intermittent flow. It is likely that

all proposed activities within an allotment management plan will result in effects that are insignificant and/or discountable and possibly will not affect these hydrological features particularly if water developments are used, especially during drought conditions, to reduce the potential impact to occupied garter snake habitat.

Garter snakes are somewhat resilient to physical habitat disturbance where harmful nonnative species are absent (USDI 2014). In the springtime, the quality of forage and water availability in the upland adjacent to riparian corridor is high (Rosgen 1994). This reduces the concentration of animals on streamside vegetation. Rest following early-season grazing allows for plants and grasses time to recover from grazing for the rest of the growing season (Rosgen 1994). The relatively cool and shady aquatic habitats often favored by primary fish species and preyed upon by garter snakes are those favored by livestock over the surrounding drier uplands. On the Hicks-Pikes Peak allotment aquatic and riparian habitats, which could potentially be occupied by garter snakes continue to be excluded from livestock grazing.

The protection of riparian and aquatic habitat in allotment management planning, through fencing, rotation, monitoring, and range improvements such as developing remote water sources minimizes effects. The effects to riparian systems from poorly managed grazing are well documented. One rangeland study indicated that 81% of the consumed vegetation came from 2% of the area which corresponded with riparian areas (USDI 2014), and underscoring the importance of off-channel waters and adequate distribution of livestock throughout the allotment.

### Livestock Management Practices – Garter snake

Effects of allotment management are similar for the four listed species and critical habitats in the Action Area because they occur in similar riparian and aquatic habitat areas. They are summarized as follows and a more detailed discussion can be found in the flycatcher allotment management practices section.

Constructing and maintaining range improvements such as water developments and fences can cause indirect effects that result primarily in locally increased erosion and sedimentation. These effects are minimized by practices that treat areas where vegetation has been removed, exposing soils. Improvements may increase grazing in previously lightly used areas, but also create heavily used areas within approximately 400 meters of a new development. Indirect effects from constructing and maintaining improvements are anticipated to be small, localized, temporary disturbance to soils.

The grazing permittee may be authorized to travel off-road in a variety OHVs, vehicles, and heavy equipment to construct, maintain, and inspect range improvements. Effects of these types of actions are primarily direct impacts to soils removing the protective vegetation layer thereby causing accelerated erosion and sediment transport to connected streams during and following storms. The resulting effects to the Garter snake and its habitats are anticipated to be small, localized, and infrequent because off-road travel would occur on a very limited basis, dispersed in space and time, avoiding areas of high erosion risk, and traveling when soil conditions are dry (EA soils analysis).

Direct effects to garter snakes could potentially occur when range improvements are being constructed or maintained, and from vehicle strikes associated with ranching activities such as off-road travel. Direct effects will be minimized by implementing the following conservation measure (provide annual education and information to permittee and ranching personnel about how to identify narrow-headed garter snakes and their habitats, and instruction that they should never be intentionally killed). Although possible, garter snakes are not anticipated to be encountered when constructing or maintaining range projects or driving off or on roads. Only a small number of improvements are or will be located on uplands near garter snake habitat, and once improvements are constructed, they are visited infrequently usually once or twice a year for maintenance. Only one drivable road occurs near critical habitat and steep rugged terrain limits off-road travel and potential for vehicle strikes associated with ranching activities. Although the most recent survey data within the action area are from 2004-2005, garter snakes were not detected at that time. They have not been observed incidentally since those surveys by AZGFD personnel

conducting fisheries surveys, and general stream surveys (Pinal Creek to confluence with Upper Salt River), or agency personnel and contractors surveying for flycatchers and cuckoos.

## Consequences of livestock management activities on private land at Horseshoe Bend

Consequences to the garter snake from livestock grazing could occur on the 40-acre parcel of private land leased by the grazing permittee. Infrastructure on the parcel improved in 2018 indicate its use will be similar to a holding pasture or large corral facility to facilitate managing livestock grazing on surrounding allotment pastures, and existing improvements on the parcel suggest that ranching related activities was also a major historical use. Improvements on the private parcel related to grazing management include fences, gates between the private parcel and allotment pastures, water troughs with at least one connected to an existing forest water development in Storm Canyon, a water storage tank, a cattle guard, and a recently constructed smaller cattle holding facility. Livestock management activities anticipated to occur on this parcel could include a variety of livestock transport, movement and husbandry practices including use of vehicles such as trucks, trailers, and occasionally heavy equipment.

Although the floodplain within the private parcel will be fenced from livestock, and ranching activities will not occur within the river floodplain because it will be fenced to exclude livestock grazing, direct effects including vehicle/equipment strikes and individual mortality as described previously could occur on private uplands adjacent to the floodplain. The leased private parcel extends for ½ mile along the Salt River floodplain and is 2.5% of the action areas 19 river miles. These effects will be minimized by providing information and education to ranch personnel as described previously. Although it is possible that garter snakes could occur on upland terrestrial habitat within the private parcel, this area is a small portion of the garter snake habitat along the river within the action area. The garter snake population along the Upper Salt River is considered extant; however, the population status of the upper Salt River segment within the action area is considered not viable (USFWS 2014). Garter snakes were not found within the action area when it was last surveyed in 2004-2005 (Holycross *et al.* (2006), and have not been observed incidentally in the action area recently by biologists conducting fisheries and riparian bird surveys, as recently as 2018 and 2016.

## Cumulative Effects – Garter snake

Cumulative effects include effects of future State, tribal, local, and private actions, not involving a Federal action, which are reasonably certain to occur within the action area of the federal action. We found one future activity within the action area that is reasonably certain to occur.

Cumulative effects are expected to occur on the 40-acre parcel of private land at Horseshoe Bend that is within the project action area and includes riparian habitats and adjacent upland habitats along the upper Salt River. This parcel is leased by the Hicks-Pikes Peak grazing permittee and its infrastructure and uses were described above. One action has been observed, and is expected to occur in this area, and a few other isolated sites along the river within the action area. At Horseshoe Bend, recreationists, primarily people fishing and/or riding OHVs drive vehicles through the private land to the river. This could result in direct effects on garter snakes from vehicle strikes and intentional killing of individual snakes.

## Critical Habitat Effects

Potential effects to proposed critical habitat from the proposed action include PCE 1a through increased and excessive sedimentation, which may affect pool and riffle habitat within the stream; PCE 2 by decreasing cover on the floodplain and adjacent uplands for snakes; PCE 3 through alteration of habitat that supports the fish prey base; and PCE 4 through the alteration of habitat that may benefit non-native aquatic species. The garter snake's proposed critical habitat PCEs apply to 600 ft. along either side of the stream.

Effects on garter snake proposed critical habitat from livestock grazing include the alteration of shrubs and saplings and structural complexity of vegetation (PCE 1c and 2). Grazing utilization on shrubs and saplings may differ for

each allotment in occupied and proposed critical habitat along the shoreline habitat (1c). The 600 foot buffer adjacent to the designated stream systems provides for adequate terrestrial space where brumation (inactivity) or gestation may occur. In general, if the utilization level is less than 10% of new growth, effects will likely be insignificant or discountable in PCEs 1c and 2. It is not expected to alter structural complexity and should provide for shrubs and sapling recruitment to move shoreline habitat toward adequate organic and inorganic structural complexity and sufficient structural characteristics to support life-history functions in the terrestrial space. Rocks, cobbles, and boulders also provide structural complexity. These are the predominant structural features along the upper Salt River and are likely to be a major source of cover and structural complexity for garter snakes within the action area.

Livestock presence may lead to some bank sloughing, sedimentation, and alteration of microhabitat underneath overhanging banks. Indirect effects may also result due to increased sedimentation and habitat alteration to occupied and proposed critical habitat where poor soil conditions exist. The increased sedimentation may be difficult to quantify due to high natural levels as well as that caused by fire in the watershed. If streams in an allotment are not experiencing high levels of embeddedness, sedimentation, or microhabitat alteration, we assume that livestock grazing is likely not affecting the garter snake or effects are discountable or insignificant.

Critical habitat extends a short distance (400 meters) downstream from the allotment boundary to the lower extent of this proposed critical habitat segment where State Hwy. 288 crosses the river. Downstream effects from grazing on the allotment would be less than indirect effects occurring on the allotment because effects of grazing on the allotment are minimized as described earlier in this document. Any effects to critical habitat downstream from the allotment can be expected to be caused by increased human related activities damaging critical habitat rather than upstream grazing.

### Recovery Status Efforts

Currently there is no recovery plan for the garter snake.

### Cumulative Effects – Garter snake Critical Habitat

Cumulative effects include effects of future State, tribal, local, and private actions, not involving a Federal action, which are reasonably certain to occur within the action area of the federal action. We found one future activity within the action area that is reasonably certain to occur.

There is a 40-acre private parcel at Horseshoe Bend that is within the project action area and includes riparian and adjacent upland habitats along the upper Salt River for approximately ½ stream mile (2.5% of action areas 19 river miles). The current grazing permittee leases this parcel and uses it to assist with managing nearby pastures on the Forest allotment. There are cumulative effects from OHVs driving through the private land parcel to the river. A variety of types of vehicles drive through the riparian vegetation to get to or near the edge of the Salt River primarily to fish along the river. These activities result in damaging and eventually removing riparian vegetation. Vehicles eventually create “windows” along the river where little or no riparian vegetation remains. These effects are reduced when permittees repair or upgrade fencing, but are anticipated to continue throughout the consultation period. Damaging and/or removing riparian vegetation can affect shoreline habitat with structural complexity, particularly bankside shrubs and saplings, which are important for thermoregulation (basking), foraging near the water’s edge, and other life history functions (USFWS 2103, USFS 2015).

### Determinations for Narrow Headed Garter Snake

Guidance and criteria from the 2015 *Framework for Streamlining Grazing Consultations* (USFS 2015) were used to evaluate effects to narrow headed garter snake from the proposed action of authorizing livestock grazing and associated livestock management practices.

## May Affect, Not Likely to Adversely Affect

1. There will be no livestock use or livestock management activities where the species is reasonably certain to occur or where there is occupied habitat.

- Aquatic and riparian habitats within the floodplain of the upper Salt River and Pinal Creek within the action area (19 miles) will continue to be excluded from livestock grazing and livestock management activities.
- Grazing and livestock management activities as described in the proposed action are anticipated to have only small effects on the fish community within the upper Salt River and Pinal Creek because of the described grazing exclusions.
- Most of the uplands providing adequate terrestrial space (600 ft.) adjacent to the river and Pinal Creek will also continue to be excluded from grazing. Some small area of the terrestrial space will be grazed because grazing exclusion fences are with 600 ft. of the edge of the floodplain (Supplemental Map 3).

2. Indirect effects occurring within the action area, adjacent to potentially occupied garter snake habitat are insignificant or discountable. That is, there is no measurable adverse effect to the species or its habitat or effects are extremely unlikely to occur. Particular attention should be given to potential impacts to the garter snakes prey base. A determination of not likely to adversely affect is not possible if native fishes or soft-rayed nonnative fishes are adversely affected, whether they are federally-listed species or not. (Reasonably certain to occur is contingent on population status in the action area, proximity to other potential populations, and duration of the proposed action.)

- Livestock will be excluded from grazing all garter snake proposed critical habitat and potentially suitable habitat in the action area. Excluded areas including fenced areas and areas inaccessible to livestock provide sediment traps between grazed allotment uplands and aquatic habitats where garter snake prey species occur.
- The garter snake population along the Upper Salt River is considered extant; however, the population status of the upper Salt River proposed critical habitat segment within the action area is considered not viable (USFWS 2014). Garter snakes were not found within the action area when it was last surveyed in 2004-2005, and Holycross *et al.* (2006), concluded that they were likely extirpated from, or nearly so, along the upper Salt River from Salt banks to Highway 288, which includes the project action area. They have not been observed incidentally in the action area recently by biologists conducting fisheries and riparian bird surveys, as recently as 2018 and 2016.
- Utilization thresholds and both riparian and upland monitoring, and anticipated responses to monitoring, are in place to ensure grazing related sedimentation does not measurably impact the river, aquatic invertebrates or the fish communities in the Upper Salt River or Pinal Creek garter snake habitats. Existing grazing exclusion, rest/deferred rotation grazing management, supplement strategies, and adaptive management will also be implemented, and are expected to contribute to minimizing any sedimentation from grazing related erosion in the action area.
- Range Improvements to increase water permanency and better distribute livestock such as water troughs and pasture division fences will be added as part of the proposed action. Such improvements may reduce concentrated soil disturbance and lessen grazing related sediment contributions into the upper Salt River and Pinal Creek. Clary and Kruse (2004), stated that “Encouraging livestock away from riparian areas is, in many cases, a key management activity. Development of off-stream water sources is often the easiest way to do this.”

## Determinations for Narrow Headed Garter Snake Critical Habitat

Guidance and criteria from the 2015 *Framework for Streamlining Grazing Consultations* (USFS 2015) were used to evaluate effects to proposed Critical Habitat for the narrow headed garter snake from the proposed action of authorizing livestock grazing and associated livestock management practices.

### May Affect, Not Likely to Adversely Affect

1. Garter snake critical habitat is present in the action area, but livestock grazing is excluded from within critical habitat.

- Aquatic and riparian habitats within the floodplain of the upper Salt River critical habitat segment within the action area (19 miles) will continue to be excluded from livestock grazing and livestock management activities.
- Grazing and livestock management activities as described in the proposed action are anticipated to have only small effects on the fish community (prey base) within the upper Salt River because of the described grazing exclusions.
- Most of the uplands providing adequate terrestrial space (600 ft.) adjacent to the upper Salt River will also continue to be excluded from grazing. Some small area of the terrestrial space will be grazed because grazing exclusion fences are with 600 ft. of the edge of the floodplain (Supplemental Map 3). Grazing in these areas will be managed using utilization thresholds and adaptive management strategies described above.

2. Indirect effects to critical habitat within the action area are determined to be insignificant or discountable. For example, any potential movement of sediments resulting from livestock grazing upstream of occupied sites are immeasurable relative to baseline levels or natural flows and perennial segments are not altered from typical levels (does not include results of drought, wildfire, or climate change).

- Grazing exclusions of the riparian habitats and most adjacent uplands by drift fences and/or natural terrain features (cliffs and steep, complex terrain), are anticipated to provide a protective vegetative layer to reduce grazing related erosion and sedimentation into proposed critical habitat.
- The river has a natural unregulated flow regime (PCE 1b) capable of processing any additional sediment loads from grazing and livestock management activities. The river within the action area is not expected to be altered from typical levels capable of processing any additional watershed-based or upstream sediments added from livestock grazing.
- Salt River aquatic and riparian habitats on forest allotments upstream are currently excluded from grazing minimizing downstream watershed-based indirect effects within the action area.
- Utilization thresholds, and both riparian and upland monitoring, and responses to monitoring (refer to project EA) are in place to ensure sedimentation does not significantly impact proposed critical habitat. When utilization thresholds are implemented, residual vegetation remains to trap sediment, which reduces effects to PCE 1, 2, and 3. Other measures to reduce erosion and resulting sedimentation include rest/deferred-rotation practices, supplement strategies, use of adaptive management, and proposed upland water developments.

3. Range improvements (e.g., fencing) within or upstream of garter snake proposed critical habitat minimize effects to the extent that they are insignificant and discountable or do not result in adverse effects during construction.

- Improvements will not take place in proposed critical habitat. Constructing drift fences tied into natural terrain features as described in the EA may result in minor, short-term local erosion (EA, soils), but would not result in adverse effects to PCEs.

- Most fencing within or upstream of proposed critical habitat in the action area is anticipated to be constructed outside proposed critical habitat, and with objectives including conserving upper Salt River aquatic and riparian habitats by excluding them from grazing, or improving livestock distribution, or both.

## Razorback Sucker (*Xyrauchen texanus*)

ESA Status:	Endangered, October 23, 1991
Forest Occurrence:	Tonto, Coconino, Prescott
Recovery Plan:	1998
Critical Habitat:	March 21, 1994

### Life History

Razorback sucker is one of the larger members of the sucker family (*Catostomidae*), reaching lengths up to 1 m and weights of 5-6 kg historically (Minckley 1973; U. S. Fish and Wildlife Service 1998). Presently, most specimens do not reach that size (McCarthy and Minckley 1987). Razorback sucker are reported to hybridize with native and nonnative catostomid suckers (Hubbs and Miller 1953; and McAda and Wydoski 1980), which may result in confusion and misidentification.

Razorback suckers in Lake Mojave can begin spawning in November, until May, peaking in February (Mueller 1993). The population of razorback suckers in Lake Mead is known to spawn later, from mid-February to early June, peaking sometime in March or April (Mueller 1993). Upper Basin populations spawn even later. Evidence of spawning in the Green River has been reported from mid-April to through June on the ascending limb of the hydrograph. Spawning has been observed at water temperatures between 6-22C (Muth *et al.* 1998) with an average of 15C reported by Tyus and Karp (1990). Optimal water temperature for egg incubation is around 20C with extreme limits to hatching occurring below 10C and above 30C (Marsh and Minckley 1985). Fecundity for razorback suckers is high ranging from an average of 46,740 eggs/fish (McAda and Wydoski 1980) to 103,000 eggs/fish (Inslee 1981). They are broadcast spawners that lay eggs over gravel and cobble substrates (U. S. Fish and Wildlife Service 2002). Eggs must hatch and emerge from the substrate before inundation with silt and sand to avoid suffocation (Wick 1997). Hatching occurs in 6-7 days at 20C (Snyder and Muth 1990), and in about 20 days when incubated at 10C (Bozek *et al.* 1984, Bozek 1991, Bozek 1990). Razorback sucker become sexually mature in 2-3 years in the lower basin (U. S. Bureau of Reclamation 1996) and after 3-6 growing seasons in the upper basin (McAda and Wydoski 1980).

All life stages consume insects, zooplankton, phytoplankton, algae, and detritus; however, relative composition varies by age and habitat occupied (Marsh 1988). During swim up, razorback sucker larvae begin feeding on plankton (Muth *et al.* 2000), but as the mouth migrates from a terminal to a sub-terminal position, the larvae begin moving toward the substrate where they begin feeding on benthos as well (Marsh and Minckley 1985). In riverine environments in the upper basin, chironimids constituted the dominant food type in razorback sucker larvae of all lengths, with cladocerans, rotifers, and algae decreasing as the larvae aged (Muth *et al.* 1998). The diet of riverine adult razorback suckers consists mostly of benthic invertebrates and lesser amounts of algae, detritus, and inorganic matter (Bestgen 1990).

### Habitat

The razorback sucker is considered a "Big River" fish that has evolved in warm-water reaches of larger rivers in the Colorado River basin. Adult razorback suckers occupy different habitats seasonally (U. S. Fish and Wildlife Service 2002), and can do well in both lentic and lotic environments (Minckley *et al.* 1991). Adults are usually captured in lower velocity water currents (Minckley *et al.* 1991), with the exception being the San Juan River where hatchery-reared, radio-tagged adult were frequently recorded in swifter currents during the summer and autumn base flow period (Ryden 2000). They use a variety of habitats during the year depending on behavioral, reproductive, and physiological requirements. During spring, adult suckers utilize deep runs, eddies, backwaters

and flooded off-channel environments; shallow runs and pools often associated with submerged sandbars in summer; and low-velocity runs, eddies, and pools in winter (USFWS 2002). Short and long-distance spring migrations of adult suckers have been documented. Spawning typically occurs at temperatures greater than 14C over bars of cobble, gravel, and sand substrates in rivers and over rocky shoals and shorelines in reservoirs (USFWS 2002). Nursery habitat typically occurs in quiet, warm, shallow water such as tributary mouths, backwaters, inundated floodplain habitats in rivers, and coves or shorelines of reservoirs (USFWS 2002). Bottomlands, low-lying wetlands, and oxbow channels periodically flooded, primarily during spring run-off, appear to be important to all life stages of razorback sucker (Muth et al. 2000). These areas provide warmer water, low-velocity flows, and increased availability of benthos and zooplankton (Wydoski and Wick 1998). Temperature appears to be an important aspect of habitat for razorback sucker adults with thermal preference lying between 22.9 and 24.8C.

## Distribution

The razorback sucker was once abundant throughout the Colorado River Basin, primarily in the mainstem and major tributaries in the western United States from Wyoming into Utah, Colorado, New Mexico, and Arizona through north western Mexico. Historically, the razorback sucker was found in the lower Colorado basin from the delta in Mexico to the area now covered by Lake Mohave in Arizona (Minckley et al. 1991). Early accounts describe occurrence of suckers in the Gila River from its confluence with the Colorado River upstream to about the Arizona-New Mexico border (Minckley 1973); in the San Pedro from the confluence with the Gila upstream to about Tombstone, Arizona (USFWS 2002). Archaeological remains of razorback sucker have been collected in proximity of the Verde River as far upstream as Perkinsville, Arizona (Miller 1961). Razorback sucker were numerous enough in the Salt River above Saguaro Lake and in irrigation canals near Phoenix to support a commercial fishery, supplying food and fertilizer (Minckley 1983). Razorback sucker were also numerous in the Salton Sea of California (USFWS 2002). The species also occurred in the San Juan River upstream as far as its confluence with the Animas River (USFWS 1998). Historic distribution of razorback sucker in the upper basin included the Colorado, Green, and San Juan River drainages (Muth et al. 2000). The razorback sucker was extirpated from the New Mexico portion of the San Juan River and all drainages of the lower basin in Arizona except the mainstem of the Colorado River. The largest population currently occurs in Lake Mohave, but that population is declining rapidly due to little or no recruitment. Discontinuous populations occur throughout the upper Colorado River basin (USFWS 2002). Recent reintroductions have taken place in the lower Colorado River basin in Arizona and the upper basin in New Mexico. They include the Salt, Gila, and Verde Rivers, Arizona and San Juan River, New Mexico (USFWS 1998).

## Razorback Sucker Critical Habitat

Critical habitat was designated for the razorback sucker in 1994 (USFWS 1994) and consists of fifteen river reaches (1,724 mi) within the Colorado River Basin covering about 49% of the historic habitat of the razorback sucker.

There is approximately 179 mi of designated CH on USFS lands along Salt, Verde, Gila, and Colorado Rivers in Arizona. The Tonto manages 66 mi of the Salt River that has been designated as CH. The Coconino, Prescott and Tonto NFs manage 113 mi of the Verde River that has been designated as CH. No critical habitat is designated on National Forest System lands within New Mexico.

## Status of the species in the Action Area

Within the 66 miles of CH along the Upper Salt River, 19 miles are within the action area for authorization of grazing on the Hicks-Pikes Peak allotment. All of the habitat for razorback sucker in the action area for this project is CH. The razorback sucker has not been successfully re-established on the Tonto primarily because of predation and competition by non-native fish species, and parasitic copepods (USFWS 1998). The most recent occurrence record within the Salt River system was in 1988, from Cherry Creek. Skeletal remains from a razorback sucker were found in the Pinto Bald Eagle nest near Roosevelt Lake in 1987. Razorback Suckers were stocked into Salt



River in the 1990s; the last stocking of approximately 2,500 razorback suckers was conducted in 1996 at Horseshoe Bend (Hyatt, 2004). Razorback suckers have not been documented in the Salt River since 1997. The likelihood that the species currently exists in the action area is extremely low, to non-existent. According to AZGFD fish surveys from the upper Salt River (Highway 288 bridge upstream to 60 bridge) in 2004, 2009, 2011 and most recently in 2018, no razorback suckers have been documented (Weedman 2004), (Evans 2009), (Gill 2011), and (Gill 2018).

Introduction of non-native species, and competition from non-native species, management activities that result in alteration of riverine conditions, and habitat loss through water impoundments and diversions, are all threats to the razorback sucker. There are also ongoing water quality issues with The Salt River within Razorback sucker CH in the action area.

The foremost threats range-wide to the razorback sucker and its critical habitat are hydrologic and environmental condition issues including water impoundments and diversions. These types of threats are limited in the action area, but do occur upstream along Cherry Creek and downstream at Roosevelt Lake. The river is undammed and free-flowing for the 19 miles within the action area and 47+ miles upstream, and therefore, hydrologic conditions (i.e. flooding, inundation of the floodplain) may occur on a relatively normal temporal scale within the action area. The river processes large amounts of sediments as part of its river functions.

Livestock grazing has not occurred in the Lower Shute Springs and Ortega Pastures within the action area since approximately year 2000. Forest permitted livestock grazing was discontinued along the Salt River corridor in 2007 upstream from the action area, but grazing occurs along portions of the north side of the river on non-forest service lands, primarily during winter months. Downstream from the action area to where the river flows into Roosevelt Lake there is a mixture of excluded and grazed pastures.

### **Razorback Sucker Effects Analysis**

The Colorado River system has changed significantly since the turn of the century with more than twenty-five major dams/barriers on the Colorado River and its major tributaries. The barriers have affected the migration of razorback sucker and dramatically altered the physical and chemical environment that occurred historically. Habitat features necessary for good nurseries, spawning and feeding areas have been destroyed. Declines in native fishes below dams has resulted due to colder water temperatures (Vanicek *et al.* 1970) and more subtle changes in stream nutrients, discharge patterns, turbidity, dissolved materials, and sediment loads (USFWS 1998). Management activities that affect water quality, flow, temperature, silt loads, stream morphology, and access to spawning areas affect razorback and razorback habitat quantity and quality. Stream flows and water temperature are especially important to razorback suckers (USFWS 2002). Razorback suckers were reported to spawn in tributary streams historically. The Salt River within the action area has limited or no surface connectivity with tributaries currently. The most significant activities affecting the species and habitats rangewide have been those associated with water development projects. Along the Salt River in the vicinity of the action area the introduction and spread of non-native competitors and predators, especially flathead catfish, channel catfish, green sunfish, red shiner, fathead minnow, carp and small mouth bass, can affect the survival or success of populations of razorback sucker. This is the most significant activity locally affecting the razorback sucker and there are probably no workable solutions to this problem during the consultation period, or in the reasonably foreseeable future.

### **Razorback Sucker Critical Habitat Effects**

Livestock grazing can de-stabilize banks, change the structure and form of channels and floodplains, interrupt nutrient cycles, increase erosion and sedimentation into the aquatic system, reduce streamside vegetation, and change the water column.

No direct effects would be anticipated to any PCE from grazing within forest riparian habitats along the river in the action area because 18.5 miles of CH and a variable width corridor of adjacent uplands would continue to be excluded from grazing as described in the proposed action and maps.

### *PCE 1: Water*

This includes a quantity of water of sufficient quality (i.e., temperature, dissolved oxygen, lack of contaminants, nutrients, turbidity, etc.) that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for the Razorback Sucker.

### *PCE 1 Effect upon Water*

The river is impaired for selenium upstream from the action area. Pinal Creek where it runs through the allotment is classified as an effluent dominated stream, which also exceeded the copper standard in 2016. From where Pinal Creek flows into the Salt River downstream to Roosevelt Lake, the river is designated as impaired for *E. coli*. Authorizing grazing of up to 300 cattle for multiple months near the river could increase the amount of *E. coli* present in the river, affecting water quality. However, livestock already graze in tributaries flowing into the river, and upstream from the action area. Therefore, it appears unlikely that authorizing grazing would measurably change *E. coli* levels in the river from current levels.

Streamflow, which is especially important to razorback suckers may also be affected by authorizing grazing of up to 300 cattle for multiple months near the river. The Upper Salt River, however, produces flows in excess of 16,000 cfs and is expected to be able to continue to produce overbank flooding during spring run-off capable of recharging water tables in spawning, nursery, and feeding habitats including backwaters, off-channel habitats, and oxbows, which are important to all life stages of razorback suckers.

### *PCE2: Physical habitat*

This includes areas of the Colorado River system that are inhabited or potentially habitable by fish for use in spawning, nursery, feeding, and rearing, or corridors between these areas. In addition to river channels, these areas also include bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas in the 100-year flood plain, which when inundated provide spawning, nursery, feeding and rearing habitats, or access to these habitats.

### *PCE 2 Effect upon Physical habitat*

Indirect effects from grazing on adjacent uplands may include increases in erosion and sedimentation into physical habitat features described above. Increases in sediments within the floodplain may eventually fill in backwaters and other floodplain features, increase overland flows, reduce infiltration, and increase depth to water table. These effects together can eventually decrease wetted areas within the floodplain. Indirect effects can also reduce or eliminate connectivity of the main river channel with its tributaries. There is currently reduced or no surface water connections with tributaries and the main Salt River channel within the action area. Razorback suckers are thought to have moved up tributaries to spawn historically.

These potential effects will be minimized by implementing utilization thresholds to provide residual vegetation and allow for plant maintenance, growth and recovery (Holechek 2011). Implementing these thresholds, along with the protective vegetative layer within the grazing exclosures, strategically placed upland water developments, and deferred/rest rotation grazing, and the use of adaptive management practices, if implemented, can be anticipated to ensure sedimentation does not significantly impact CH for the sucker in the action area.

### *PCE 3: Biological environment*

Food supply, predation, and competition are important elements of the biological environment and are considered components of this constituent element. Food supply is a function of nutrient supply, productivity, and availability to each life stage of the species. Predation and competition, although considered normal components of this environment, are out of balance due to introduced nonnative fish species in many areas.

### *PCE 3 Effect upon Biological environment*

The largest effect preventing razorback suckers from being successfully reintroduced into CH in the action area appears to be the predation-competition component of PCE 3, as described above and below. Non-natives prey on, and compete with, native fish like the razorback sucker and others. In 2018 fish surveys, described in the garter snake effects write-up, documented that large numbers of non-native fish were captured at Horseshoe Bend in 2018 and in earlier years. This existing condition is not expected to change significantly during the consultation period. Although critical habitat PCE 2 will likely retain some elements of higher quality spawning, nursery, feeding, and rearing habitats in areas where the floodplain remains excluded from livestock grazing, the non-native fish issue, which is not related to grazing, will continue to prevent successful reintroductions into CH along the river.

Grazing on uplands upslope from CH could affect feeding areas and food supply in CH by increasing erosion and sedimentation. Macro invertebrate assemblages can decline from chronic sedimentation because silts and sediments blanket substrates which are necessary for photosynthetic prey base (algae and other microorganisms) to thrive (Merrit & Strand, 1999). Changes within the water column which affect prey base for macro invertebrates may reduce macro invertebrate abundance and may lead to less available prey for insectivorous fish. However, Razorback suckers are not currently present in the river.

### Consequences of livestock management activities on Razorback Sucker Critical Habitat on private land at Horseshoe Bend

Potential consequences caused by the proposed action on the 40 acre parcel of private land leased by the Hicks-Pikes Peak allotment grazing permittee to assist in managing the Ortega and Lower Shute Springs pastures could include those described above for PCEs 1-3; in summary these could include damaging and removing critical habitat. Critical habitat within the private parcel consists of ½ stream mile of riparian and aquatic habitats within the 100 year floodplain, and is 2.5 % of the action areas 19 stream miles (Supplemental Map 3).

These potential consequences will be eliminated or minimized because the grazing permittee will add, modify, and maintain fences to keep cattle on upland portions of the private land (approximately 30 acres), and outside of riparian habitats within the floodplain, and aquatic habitat in the river channel, which have PCEs for razorback sucker critical habitat.

### Recovery Status Efforts

In the mid-1980s, the USFWS and the AZGFD began efforts to reintroduce the endangered razorback sucker to the Salt and Verde Rivers in Arizona. However, large numbers of non-native predators may thwart the efforts (Minckley and Deacon 1991) to reestablish razorback populations. Critical Habitat has been designated on National Forest System lands in Region 3 for razorback sucker on the Tonto, Prescott, and Coconino National Forests and forests in other states. Critical habitat has been designated on the Salt River between Roosevelt Reservoir and the confluence with Canyon Creek (this segment includes the project action area). A reanalysis of threats is needed to begin remedying for successful reintroductions.

There are no plans for additional stockings of this species in the 66 mile Upper Salt River CH segment due to a variety of concerns including ongoing problems with introduced non-native species, objections from stakeholders, and budget limitations (Pers. Comm. L. Fitzpatrick, 2013).

### Livestock Management Practices – Razorback Sucker

Effects of allotment management are similar for listed species and critical habitats in the Action Area and are summarized as follows. Refer to flycatcher allotment management section for a more detailed discussion.

Constructing and maintaining range improvements such as water developments and fences can cause indirect effects that result primarily in locally increased erosion and sedimentation. These effects are minimized by practices that treat areas where vegetation has been removed exposing soils. Improvements may increase grazing in previously lightly used areas, but also create heavily used areas within approximately 400 meters of a new development.

Effects from constructing and maintaining improvements are anticipated to be minor, localized, temporary disturbance to soils.

The grazing permittee may be authorized to travel off-road in a variety OHVs, vehicles, and heavy equipment to construct, maintain, and inspect range improvements. Effects of these types of actions are primarily direct impacts to soils removing the protective vegetation layer thereby causing accelerated erosion and sediment transport to connected streams during and following storms. The resulting effects to Razorback Sucker critical habitat are expected to be small, localized, and infrequent because off-road travel would occur on a very limited basis, dispersed in space and time, avoiding areas of high erosion risk, and traveling when soil conditions are dry.

### **Cumulative Effects – Razorback Sucker Critical Habitat**

Cumulative effects include effects of future State, tribal, local, and private actions, not involving a Federal action, which are reasonably certain to occur within the action area of the federal action. We found one future activity within the action area that is reasonably certain to occur.

There are effects from OHVs entering the private parcel, and subsequently pioneering routes onto adjacent forest critical habitat. Various types of OHVs drive within the floodplain to get to or near the edge of the river primarily to fish along the river. These activities cause physical damage to the floodplain and aquatic habitats and remove floodplain vegetation.

These effects are reduced when permittees add, upgrade, and repair riparian protection fencing, but are expected to continue throughout the consultation period.

### **Razorback Sucker Determination**

The following criteria are to be used by a fisheries biologist to determine the effects that the proposed livestock grazing and management activities will have on the previously described fish species.

#### **No Effect**

1. The species is not present in the action area.

The Tonto NF, Globe Ranger District has determined that the Razorback Sucker is no longer present in the Upper Salt River within the Hicks-Pikes Peak Allotment action area, or upstream and therefore, the determination for this species is No Effect. Fisheries surveys between 1997 and 2018 have not detected this species in the river.

Introduced non-native fish species continue to be documented in large numbers and this condition is expected to continue throughout the consultation period.

### **Razorback Sucker Critical Habitat Determination**

The following criteria are to be used by a fisheries biologist to determine the effects the proposed livestock grazing and management activities may have on the PCEs of the CHs described above:

#### **No Effect**

1. Is designated CH not present within the Action Area?

2. Will livestock grazing within the Action Area will be excluded so that there is no exposure or impact to the PCEs?

- The Hicks-Pikes Peak grazing action does not meet either of these criteria, thus there may potentially be an affect.

#### May Affect, Not Likely to Adversely Affect

1. Direct effects to primary constituent elements of CH will be avoided by yearlong exclusion of livestock from CH.

- Livestock grazing is excluded from 18.5 miles of designated CH on forest lands within the action area.

2. Indirect effects to primary constituent elements of CH which result from upland grazing are determined to be insignificant or discountable as measured through quantitative or qualitative measures such as watershed health and condition, use levels, or sedimentation in CH.

- Utilization thresholds, and both riparian and upland monitoring, and responses to monitoring (refer to project EA) are in place to ensure sedimentation does not significantly impact the Upper Salt River CH. Other measures to reduce soil erosion and sedimentation include deferred-rotation grazing practices, supplement strategies, and use of adaptive management.
- Although substantial sedimentation can be observed entering CH, the river in this segment retains most dynamic riverine processes and therefore effects from erosion and sedimentation are likely short-term effects that both remove and build habitat throughout this CH segment, and downstream. Given that the rivers natural hydrologic processes to transport sediment remain intact and flows can reach 16,000 cubic feet/second, chronic sedimentation caused by grazing would not be expected as an effect of the proposed action at a level where it would detectably affect PCEs.

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## Appendices

Table 8: Proposed Additional Infrastructure - Fencing

Identifier	Description	Pasture
AF2, AF6	Fence to split pasture into separate pastures.	Lower Shute
AF4	Install a drift fence near the Salt River and Pinal Creek to provide a barrier to keep cattle from accessing the river. A minimum tools analysis would be completed to authorize fence construction in designated wilderness areas.	Lower Shute
AF5	Fence to split pasture into three individual pastures.	Horseshoe Bend
AF7	Fence to split pasture into two individual pastures.	Upper Shute
AF8, AF9	Fence to split pasture into separate pastures.	Windmill

Table 9: Proposed Additional Infrastructure - Cattleguards

Identifier	Description	Pasture
AF2, AF6	Fence to split pasture into separate pastures.	Lower Shute
CG1, CG13, CG16	Cattleguard	Kenny/West, Kenny/Holly, Kenny/Murphy
CG3	Cattleguard	Hope/Ortega
CG5	Cattleguard	Upper Big/Big
CG7	Cattleguard	Windmill new pasture split
CG9	Cattleguard	Upper Shute Spring new pasture split
CG10	Cattleguard	Upper Shute Springs/Ortega
CG8, CG11, CG12, CG18	Cattleguard	Windmill/Upper Shute Springs Windmill/Horseshoe Bend
CG14	Cattleguard	South Steer/Horseshoe Bend
CG15	Cattleguard	Rip/Hicks

CG17, CG20	Cattleguard	Lower Devore/Yellow Lower Devore allotment boundary
CG2, CG4, CG6, CG19	Cattleguard	Horseshoe new pasture splits, Horseshoe Bend/Ortega, Horseshoe Bend Allotment Boundary

Table 10: Proposed Improvements - Water Developments (springs, troughs, storage tanks) and Corrals

Identifier	Description	Pasture
AF2, AF6	Fence to split pasture into separate pastures.	Lower Shute
AW10	Install a corral	Yellow
AW11	An above ground water line, trough, and corral.	Big
AW12	An above ground water line running from Cement Spring to a new trough.	Upper Big
AW13	An above ground water line running from Procopio Spring to a new trough and storage tank.	Windmill
AW14	An above ground water line running from Apache Spring to a new trough.	Horseshoe Bend
AW15	An above ground water line running from Little Brewster Spring to a new trough and storage tank	Horseshoe Bend
AW16	In Section 26, extend a water line and install a new trough.	Horseshoe Bend
AW17	In Section 36, extend a water line and install a new trough.	Horseshoe Bend
AW18	Add another water line and new trough	Horseshoe Bend
AW19	An above ground water line running from Brush Spring to a new trough and storage tank	Horseshoe Bend
AW20	In Section 23, extend a water line and install a new trough.	Hope

AW21	In Section 11, extend a water line and install a new trough.	Hope
AW22	An above ground water line running from Grapevine Spring to a new trough and storage tank.	Hope
AW24	An above ground water line running from Lower Grapevine Spring to a new trough and storage tank	Ortega
AW25	Extend a water line and install a trough from Horse Spring.	Horseshoe Bend
AW26	Install an above ground water line along Forest Road 219 to a new trough.	Horseshoe Bend
AW27	Install an above ground waterline to a new trough and storage tank.	Horseshoe Bend, Upper Shute
AW29	Install a new storage tank at Wood Spring.	Windmill
AW30	Install an above ground waterline to a new trough and storage tank	Upper Shute
AW31	Add an additional above ground waterline from AW30 and two troughs.	Upper Shute
AW32	Install a new storage tank and trough from Shute Springs.	Upper Shute
AW33, AW34	Install a new above ground water line and troughs.	Upper Shute, Lower Shute
AW5	Install a corral, storage tank, trough with an above ground water line, and drill a well near Murphy Spring.	Murphy
AW6, AW7, AW8, AW9	Install a new above ground water line and troughs.	Rip, Hicks, Yellow

## Administrative Actions to Adjust Grazing Management

There are several types of administrative actions that could be used to modify grazing management within the allotment. If monitoring indicates that desired resource conditions are not being achieved in the desired time frame or in areas of this allotment, there are tools, or administrative actions that would be used to modify livestock management. Although there are many factors which may cause a desired condition to not be met, the following tables show how livestock management may be modified if livestock grazing is determined to be the probable cause why these desired conditions are not being met. These tables list examples of administrative actions included in this proposed action that may be taken to respond to certain resource conditions.

**Table 11: Management Indicators for Species, Vigor, Cover, Litter**

Desired Condition	If	Then	Follow up
	Initial reduction in vigor, cover, litter	Monitor range readiness before livestock authorization in following year.	Document. If necessary, conduct rangeland health evaluations. Install vegetation cages or exclosures to further identify local vegetation conditions.
Maintain or improve, as compared to local TEUI, native species cover, litter and vigor	Drought models predict reduced precipitation amounts due to change in weather pattern and Standard Precipitation Index below -1.	Monitor range readiness	Work with permittee to develop further drought response strategies. Document and conduct rangeland health as needed.
	Reduction in vigor, cover, litter due to prescribed or wildfires.	Monitor for range readiness and work with district office to identify attributes.	Monitor for attributes to authorize grazing.
	Continued reduction in vigor, cover, litter at one key area due to distribution	Use salting and herding to move livestock to unused or lightly used portions of pasture.	Document and monitor range readiness.

**Table 12: Management Indicators for other resources.**

Desired Condition	If	Then	Follow up
Maintain Satisfactory soil condition and manage for an upward trend of impaired soil condition.	When soils are assessed, a soil condition category indicates a reduction of soil quality such as hydrologic, nutrient cycling or stability.	Rest pasture for a growing season or move cattle away from critical area by salting, herding until further monitoring is conducted.	Schedule to monitor for soil condition trend within a couple years.  After follow-up monitoring, conclude if supplemental analysis is needed to adjust management.
Minimize the annual impacts to seedling and sapling riparian woody species in key reaches	Initial occurrence of grazing exceeding riparian utilization standards  Grazing continues to exceed riparian utilization standards and recent Proper Functioning Condition monitoring shows.....	Move cattle away from key reaches with salting and herding.	Follow up annual monitoring with Proper Functioning Condition.
Maintain water quality standards for criteria identified as “Attaining” standards or improve water quality for criteria currently rated as Impaired by implementing actions to improve water quality and/or cooperate with the Arizona Department of Environmental Quality in implementing recommendations	Livestock have accessed Pinal Creek during pasture grazing period.	Move cattle away from Pinal Creek with salting and herding.	Monitor livestock access to Pinal Creek.

Desired Condition	If	Then	Follow up
<p>in a Total Maximum Daily Load (TMDL) analysis</p>			
<p>Maintain water quality standards for criteria identified as “Attaining” standards or improve water quality for criteria currently rated as Impaired by implementing actions to improve water quality and/or cooperate with the Arizona Department of Environmental Quality in implementing recommendations in a Total Maximum Daily Load (TMDL) analysis</p>	<p>Livestock continue to access Pinal Creek due to insufficient fencing or lack of water sources.</p>	<p>Reconstruct existing fence, establish locations for new drift fencing or water locations.</p>	
<p>Manage watersheds to improve to a satisfactory or better condition. As the Watershed Condition Framework is currently the Forest Service’s accepted measure of watershed condition, satisfactory equates to a rating of “functioning properly”.</p>	<p>Riparian utilization standards are exceeded in key reaches, or insufficient riparian vegetation is present to allow for meaningful (statistically valid) riparian monitoring</p>	<p>Livestock should be removed from the pasture. Areas with insufficient riparian vegetation to allow meaningful monitoring should be rested until sufficient riparian vegetation is established for statistically valid monitoring to occur.</p>	

**Table 13: Management Indicators for Riparian Utilization**

Desired Condition	If	Then	Follow up
Riparian utilization will not exceed 50% of terminal leaders of trees and shrubs under 6 feet tall, not exceed more than 40% of biomass of herbaceous species, maintain a residual stubble height of 6-8 inches of emergent vegetation	Initial over-use during grazing season	Move to next scheduled pasture. Or use salting and herding to reduce pressure on riparian area.	Measure range readiness prior to livestock authorization.  If cattle remain in pasture, continue measuring key reach for further utilization.
	Continued over-use on same reach, especially after salting and herding.	Rest pasture, reduce livestock numbers, or change season of use.	Monitor to ensure effectiveness.
Maintain residual herbaceous vegetation in key riparian areas.	Continued over-use on same reach, when water sources are located in riparian areas or drainages.	Identify new locations for improvements outside of riparian areas or change season of use.	Obtain appropriate site specific clearances for new water locations outside of riparian areas.
Increase the proportion of obligate and facultative riparian species.	Continued over-use on same reach in well-watered pasture	Identify locations for exclosure fencing, reduce livestock numbers, or utilize a cool season grazing strategy.	Obtain appropriate SHPO concurrence. Monitor for affected plant recovery
	Utilization levels are below allowable use threshold	Extend use in pasture	Keep log of pasture extensions and determine if increase in livestock numbers are supported.

Winter and spring precipitation result in conditions ideal for recruitment of seedling riparian species

Consider resting areas of dense recruitment for two growing seasons to allow newly recruited vegetation to grow above the reach of grazing cattle.

Document areas of dense recruitment and monitor growth to assess when they have grown beyond the reach of livestock

**Table 14: Management Indicators for Upland Utilization**

Desired Condition	If	Then	Follow up
Upland utilization does not exceed allowable use threshold	Utilization levels are below threshold on at least two key areas.	Extend use in pasture	Keep log of extensions and determine if increase in livestock numbers are supported.
	Initial over-use during grazing season on at least one monitoring area	Move to next scheduled pasture or use salting and herding to move livestock to less grazed areas.	Measure range readiness prior to livestock authorization.
	Continued over-use in pasture on at least two key areas	Rest or defer pasture.	Measure range readiness prior to livestock authorization.
	Continued over-use in pasture with accessible but ungrazed areas.	Use more strategic salting and herding or consider adding additional waters, close off waters, or fences to encourage distribution. Reduce livestock numbers or utilize a cool season grazing strategy	Monitor for native plant recovery.



Desired Condition	If	Then	Follow up
	Continued over-use in pasture with no other accessible ungrazed areas	Reduce Livestock numbers or utilize a cool season grazing strategy	Monitor for native plant recovery.

**Table 15: Management Indicators for Managed Grazing Methods**

Desired Condition	If	Then	Follow up
Livestock are managed on appropriate pastures through managed grazing methods	Increased precipitation and/or favorable precipitation outlook with maintained or positive trends in other desired conditions	Consider increase of livestock numbers	
	Livestock are not in authorized pasture but on allotment due to insufficient fencing	Forest Service will require interior pasture fence in question to be reconstructed or add additional fencing.	Follow up with inspection of fencing.
	Livestock are not in authorized pasture but on allotment due to gates left open.	Livestock immediately gathered and placed back in authorized pasture.  Identify if new gates are needed (i.e. easier to close, metal gates). Ensure gates have proper signs.  Consider replacing with cattle guard.	Follow up with pasture inspection or project authorization letter.

Desired Condition	If	Then	Follow up
	Livestock are not on authorized allotment, due to insufficient fencing or gates left open.	Livestock immediately gathered and placed back in authorized pasture.	Bill for unauthorized use.
	Livestock are affecting the protection of historic properties	Relocation of range improvement or salting location	Archeology will monitor impacts to relocation.
	Livestock are affecting the protection of historic properties and relocation of improvements is not plausible.	Fence out livestock from historic properties and relocate range improvement if needed.	Archeology will monitor impacts to fencing.

**Table 16: General guidelines for domestic livestock grazing in southwestern willow flycatcher habitat.**

Site Conditions			Site-Specific Guidelines	
Habitat Status	Flycatcher Status	Season	Low-Stature Habitat: 3-4m shrubby willow	All other habitat types $\square$ 1830 m or 6000 ft elevation
1. Restorable or Regenerating Habitat <sup>1</sup>	1A. Unoccupied	Growing Season <sup>2</sup>	No grazing.	No grazing.
	1B. Unoccupied	Non-Growing Season	No grazing.	Provisional grazing <sup>3</sup> (assumes grazing is not a major stressor).

2. Suitable Habitat	2A. Unoccupied	Growing Season	No grazing.	No grazing, but at discretion of USFWS, provision for a limited number of small-scale, well-designed experiments to determine levels of pre-breeding season grazing that do not adversely affect southwestern willow flycatcher habitat attributes. Grazing not to exceed 35% utilization of palatable, perennial grass or grass-like plants in uplands and riparian habitats, and extent of alterable stream banks showing damage from livestock use <sup>4</sup> not to exceed 10%. <sup>5</sup>
	2B. Unoccupied	Non-Growing Season	Conservative grazing with average utilization not to exceed 35% of palatable, perennial grasses and grass-like plants in uplands and riparian habitats, and extent of alterable stream banks showing damage from livestock use not to exceed 10%. Woody utilization not to exceed 40% on average.	Conservative grazing with average utilization not to exceed 35% of palatable, perennial grasses and grass-like plants in uplands and riparian habitats, and extent of alterable stream banks showing damage from livestock use not to exceed 10%. Woody utilization not to exceed 40% on average.
	2C. Occupied	Growing Season	No grazing.	No grazing until research in comparable unoccupied habitat demonstrates no adverse impact; if unoccupied habitat becomes occupied habitat, continue existing management (grazing should not exceed 35% of palatable, perennial grasses and grass-like plants in uplands and riparian habitats, and extent of alterable stream banks showing damage from livestock use not to exceed 10%).
	2D. Occupied	Non-Growing Season	No grazing.	Conservative grazing with average utilization not to exceed 35% of palatable, perennial grasses and grass-like plants in uplands and riparian habitats, and extent of alterable stream banks showing damage from livestock use not to exceed 10%. Woody utilization not to exceed 40% on average.

3. Uplands & Watershed Condition <sup>6</sup>	3. Occupied & Unoccupied	For any season of use	Average utilization of palatable, perennial grasses and grass-like plants not to exceed 30-40%. Use stubble height guidelines: 3" for short grass, 6" for midgrass, 12" for tall grass. Determine monitoring species prior to grazing.	Average utilization of palatable, perennial grasses and grass-like plants not to exceed 30-40%. Use stubble height guidelines: 3" for short grass, 6" for midgrass, 12" for tall grass. Determine monitoring species prior to grazing.
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<sup>1</sup>Restorable  $\cong$  means riparian systems that are degraded but have the appropriate hydrological and ecological setting to be restored to suitable flycatcher habitat, and could be restored with reasonable costs and actions. Lack of regeneration due to grazing is one factor contributing to habitat degradation; conditions in each habitat should include adequate plant regeneration to ensure habitat sustainability into the future. At these sites, flycatcher habitat is precluded largely or solely by livestock impacts. A Restorable  $\cong$  habitats are those that would be suitable if not for grazing, alone or in combination with other major stressors. This means cessation of grazing is a necessary, but not necessarily a sufficient action.

<sup>2</sup>Growing season is defined as bud break to leaf drop for cottonwood and willow species. Non-growing season is defined as leaf drop to bud break for cottonwood and willow species.

<sup>3</sup>Grazing should only be conducted if it is not a major stressor and does not preclude satisfactory progress toward suitability.

<sup>4</sup>Damage to stream banks from livestock use includes: bank chiseling, trampling, trailing, soil compaction, breakage of vegetation, bank sloughing, etc.

<sup>5</sup>Alterable stream banks are those portions of banks containing exposed soil or vegetation and not composed of bedrock, boulders, or large cobbles (Fleming et al. 2001).<sup>6</sup>Uplands and watersheds, or portions of watersheds, associated with areas identified as restorable, regenerating, or suitable southwestern willow flycatcher habitat. General guidelines should be implemented unless site-specific data clearly indicate that deviation from the guidelines will not prevent or slow progression toward suitability and/or maintenance of suitable habitat conditions.



# MAP – APPENDIX

Figure 1: Hicks Pikes Peak Immediate Infrastructure Map with Wildlife Data

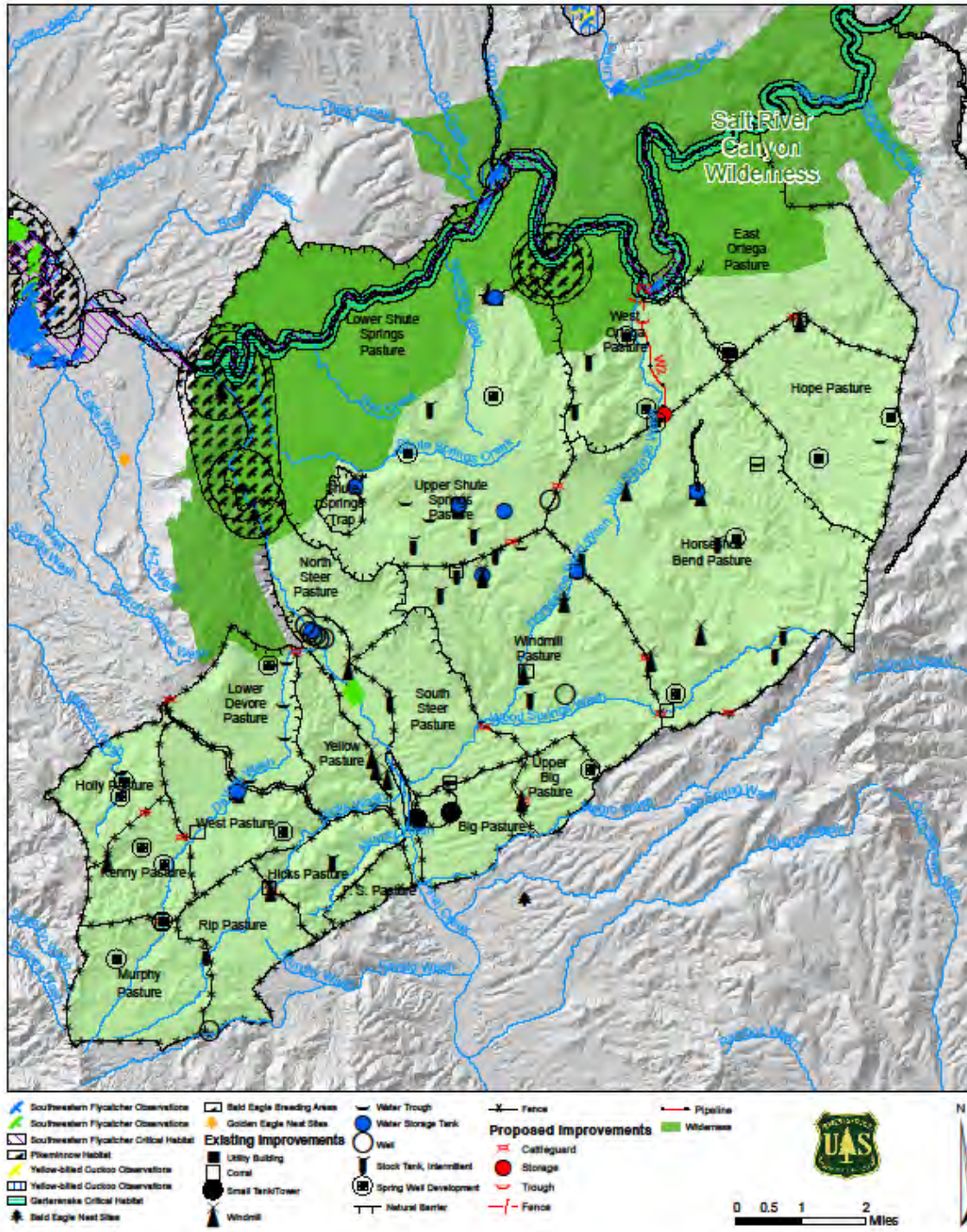


Figure 2: Hicks Pikes Peak Additional Infrastructure with Wildlife Data

